Barriers and Expectations of employees regarding a healthcare-related intervention based around persuasive senor technology measuring sedentary behavior and physical activity.

Qualitative research on persuasive sensor technology

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Abstract

Insufficient physical activity and excessive amounts of sedentary behavior are becoming increasingly prevalent among the Dutch working population. These problems might be able to be tackled via eHealth interventions using persuasive technologies. Wearable sensor technology is a suitable vehicle for an intervention of that kind. The goal of this study is to identify barriers and expectations in regards to wearables as well as perceived privacy concerns among the population.

A series of 12 qualitative semi-strucutred interviews were carried out. The participants were Dutch lecturers and PHD students, with a mean age of 39 years.

The results revealed several barriers among the participants, most notably, lack of usefulness of the device, disruption at work and being stigmatized as sick. The expectations of the participants included insights in users' patterns of behavior, covert design and incorporation of multiple functions. In regards to privacy risks, the participants were concerned with the provider of the wearable abusing their data for profit, as well as healthcare providers, employers and banks using that health-related data to disadvantage of the user. Factors that mitigated that risk were if the user of the device had to give permission for access or when sharing information with healthcare professionals and Universities for research.

In conclusion, there are several barriers that have to be dealt with in order to successfully implement wearable sensor technology in persuasive eHealth interventions. However, there are different strategies that can be employed when dealing the issues that the participants reported, for instance ensuring procedural justice, using electronic health records (EHR) as well as organizational support. These might be interesting points of reference for further research into the successful applications of this technology.

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1. Introduction

1.1 Physical Activity and Sedentary Behavior

With machines taking over physical work and providing effective means of transportation, the human race relies less and less on physical activity in their everyday life. For instance, a study conducted by the Dutch government has shown that one third of the adult Dutch population (19 years and older) do not meet the requirements of the Norm for Healthy Movement (Nederlandse Norm Gezond Bewegen; Wendel-Vos, 2014) and thus are unhealthily physically inactive. Furthermore, the results of a study conducted by Ronda, van Asssema and Brug (2001) were even more uniform: 60% of the 2608 Dutch adults participating in the study did were too inactive to meet the "target for physical activity to promote health". The possible consequences of physical inactivity is estimated to have caused 5,3 million of the 57 million deaths that occurred in 2008. On top of that, chronic disease like type 2 diabetes and coronary heart disease have been linked to physical inactivity, not to mention breast and colon cancer (Min-Lee, 2012 et al). Also, research indicates that sufficient physical activity can contribute to improving mental health, most notably depression (Paulska & Schwenk, 2000).

When talking about being physically active and healthy, sedentary behavior has to be considered as well. Sedentary activities or behavior can be defined as tasks that require a very low investment of energy, which are performed while sitting or lying down (Tremblay, 2012). However, it also is simply defined as "time spent sitting" in other instances (Hallal et al, 2012). It is important to note that sedentary behavior is more than the absence of physical activity, but also refers to everyday habitual behavior (Owen et al, 2000) and includes activities like sitting in front of a computer, television or sitting in a car (Chastin et al, 2014). Furthermore, Hendriksen et al (2013) state in their paper that sedentary behavior can cause a range of health related problems independently of the amount of physical activity. Thus, it is possible for someone to meet the requirements to be a physically active person (eg. 30 minutes of moderately physical activity five days a week or 20 minutes of intense activity 3 days a week), but still engage in an unhealthy amount of sedentary behavior (Hallal et al, 2012; Owen, Healy, Matthews & Dunstan, 2010). The health related risks of excessive sedentary behavior include type 2 diabetes and a higher risk of mortality (Hendriksen, 2013). On top of that, uninterrupted, static sitting behavior has been suggested to contribute to lower back pain, which is the most common among chronic diseases with an international prevalence of 23% (Airakinen et al, 2006; Lis et al, 2007). Furthermore, weight gain and obesity can be linked to sedentary behavior as well, as it has been indicated by a longitudinal study conducted from 1996 to 2011 (Thorp et al, 2011). Finally, people working in jobs with little physical activity were twice as likely to suffer from cardiovascular disease than those who move at work (eg. Bus drivers versus bus conducters; Morris et al, 1953). Unhealthy amounts of sedentary behavior are especially prevalent among the working population (Jans et al, 2007), with more than 3,4 million Dutch employees sitting longer than four hours each day at work (Hendriksen et al, 2013). Furthermore, a study conducted by the Dutch government has shown that more than one in four Dutch people sit eight and a half hours on an average day (Wendel-Vos, 2014).

Since long hours of sitting are hard to be avoided, especially in terms of the time spent sitting at work, it is important to examine the ways to minimize this unhealthy behavior: Interrupting periods of sedentary behavior (eg. taking a 5 minute break every hour) has been linked to the decrease in the effect of weight gain and improving weight control (Swartz, Squires & Strath, 2011). Furthermore, a report from the US government suggests that interrupting sedentary behavior has a positive effect on patients with type 2 diabetes (Owen et al, 2012).

When trying to decrease unhealthy behavior like sedentary behavior or physical activity, it is important to change the attitude of an individual regarding that behavior. According to the Persuasive System Design model, this change in attitude is achieved by persuading an individual through the means of information technology, using the Web to reach a large scale of individuals in the population. In this context, persuasive systems are commonly referred to as “computerized software or information systems designed to reinforce, change or shape attitudes or behaviors or both without using coercion or deception” (Oinas-Kukkonen and Harjumaa, 2008). In other words, the goal of this technology is not to “trick” the user into changing their behavior, but rather to persuade the user directly, without deceiving the user. Furthermore, it is being stressed that this kind of change in behavior and attitude is an incremental process that has to be initiated consistently and in a step-by-step manner by interacting with a technology, which is referred to as computer-human persuasion. This form of persuasion has been suggested to be similar to social communication dynamics among humans. In regards to influencing physical activity and sedentary behavior, internet technologies can be used to consistently and incrementally influence a large population of individuals, possibly changing their attitude towards movement at the workplace.

1.2 eHealth

eHealth is a rising branch in the healthcare sectors, not only in the Netherlands, but also on a global scale (GGZ, 2013). According to the definition by van Rijen, de Lint and Ottes (2002), which is also accepted by the Dutch GGZ, eHealth refers to communication- and information technology that is meant to improve and extend the reach and effectiveness of healthcare interventions. This is especially true for internet technologies, which allow the interventions to reach more people, addressing a more specific problem or population than traditional healthcare can, since the intervention may, for instance, be designed to be used on a phone as an application. This also means that eHealth interventions provide a cost effective alternative to traditional healthcare, which is especially relevant considering that healthcare costs are rising drastically: The total expenses for healthcare in the Netherlands was at more than 57 billion euro in 2003 (Slobbe et al, 2006). On top of that, a policy letter by the Dutch CPB estimated the percentage of the Dutch total gross national product spent on healthcare will rise from 19% in 2011 to 31% in 2040 (van de Horst, Erp & de Jong, 2011). However, since the participants of the intervention are not being supervised or instructed personally, eHealth-based interventions rely on the use of persuasive technology. This term refers to technology that is designed to reinforce the desired behavior and to encourage the participant to keep participating in order to maximize the effect of these interventions (Wentzel, de Jong & van Gemert-Pijnen, 2014). The eHealth sector can provide essential support for the implementation of interventions in accordance to the PSD model. Aside from relying on internet technologies, there are several key aspects that have to be addressed when discussing the PSD model. These issues, introduced by Oinas-Kukkonen and Harjumaa (2009), have to be dealt with in order to achieve a successful intervention. To begin with, information technology aims at influencing the user's behavior at any given time rather than being used inconsistently ("information technology is always on"). Second, motivating the user to engage in commitments makes him or her more likely to be persuaded. This is because people strive for cognitive consistency, thus, by making a commitment, encourages an individual to live up to these commitments. Third, it is important to recognize the individuals that are being targeted when choosing persuasion strategies: More reflective individuals who deal with the given information thoughtfully, may be more receptive to "direct routes" of persuasion. Conversely, indirect routes of persuasion might be more appropriate for less reflective individuals, who tend to rely on stereotypes and generalization. Notably, the direct routes have proven to have a more lasting effect than indirect strategies. Fourth, it has to be considered that a change in attitude is not achieved within a single session, but is rather being adopted incrementally. Fifth, it is important to draw the users' attention to possible designer biases, since there is a threat to the persuasiveness of the strategy otherwise. Sixth, the system should be as unobstructive to the user as possible, as well as being easy to use and effective at the same time (Oinas-Kukkonen & Harjumaa, 2009). These requirements pose a possible framework for an eHealth intervention. Within this framework, appropriate technology has to be identified that is capable of implementing the required aspects and features of such an intervention.

1.3 Sensor Technology & Wearables

Wireless sensor technology emerged in the 1950's, developed by the American military as a surveillance system (Silicon Laboratories Inc., 2013). Since then, sensor technology has been developing rapidly due to persistent micro-technology trends, which are still relevant and expected to remain that way in the course of the next decade (Bohn et al, 2004). Taking into consideration that Moore's Law, which states that the power of micro-technology doubles every 18 months, has proven to be true in regards to sensor technology, it becomes obvious that there have been significant advances in this field (Bohn et al, 2004). For instance, sensor technology can be found when examining “smart cities” that use this technology to monitor the amount of free parking spots, determine the state of buildings and bridges or integrate traffic lights that can react in real time to conditions on the road (Alton, 2015). Also, due to these developments, it has become possible to integrate sensor technology into wearable devices, for instance a wristband or even in smartphones. For instance, the application “Cardiio” allows the user to measure their resting heart rate using their mobile phone (Alton, 2015). By being implemented in everyday objects, these devices can interact and detect real life circumstances and act accordingly. Sensor technology has become a central aspect to our everyday life (Bohn et al, 2004). Consequently, computers are taking over basic tasks in the background with little dependence on human interaction. This is a phenomenon referred to as “ubiquitous computing” (Bohn et al, 2004). As Weiser stated in his paper in 1993, the most “profound revolutions” are the ones that occur without raising awareness. Comparably, sensor technology has become a crucial part of the way we live our life today.

There is a huge number of different implications for wearable technologies. Since wearables are being considered to be easily combined with persuasive techniques (eg. Huang, Murphy & Zimmermann, 2014; Ananthanarayan & Siek, 2012) they are interesting to be used for eHealth related interventions. The wearables function in regards to tracking physical activity and sedentary behavior will be examined more closely in regards to this study. First, there are wearable devices as quantifiers of physical activity, which are commonly referred to as “personal activity trackers” (Hoy et al, 2016). These devices measure anything from steps taken and distance traveled, using GPS, to sleep rhythms and heart rate. In his paper, Hoy et al (2016) defined activity trackers as devices that are worn on the users body, using sensors to measure biometric data and movements to then upload that data to an online application that shows the results in trends over time. Since the release of the personal activity tracker in form of a wristband, FitBit in 2008, the use of these devices has increased rapidly. (Crawford et al, 2015). A survey conducted by Fox and Duggan (2013) among American adults showed that 60 percent of the adult American population has used trackers at least once to measure their habits of eating and movement. However, it is important to acknowledge that producers of these trackers are not required to provide information about the reliability of the data, which has proven to be noticeably inaccurate (Stackpool et al, 2014). Second, wearables can also be used to interrupt sedentary behavior, like the activPal, which has been subject to research, validating its accuracy and effectiveness (Koazey-Keadle et al, 2010). Furthermore, this function has already been adopted by smartwatch producers like Apple (Green, 2015). It is obvious that wearables are capable of being used in the context of eHealth-based interventions.

Considering its compact sensors and interactive design, it becomes clear that wearable technology is a proper technology to implement an eHealth intervention, as far as the functional aspects are concerned. However, interventions based on this kind of technology can still fail if the target population refused to use the technology or if the technology was not appropriately implemented in regards to the expectations of that target population. For instance, numerous researchers refer to user-satisfaction as a key factor that contributes to the success of information technology (Al-Khaldi & Wallace 1999; Gelderman 1998). The construct of user satisfaction constitutes of several key factors for realizing the expectations of the user, such as user attitude towards information technology, user interface features and quality of the information from the information technology (Ditsa & McGregor, 1996). This is especially problematic considering that the role of the user tends to be less in focus, while they should be treated as active participants in regards to the technology (Clegg, 1993). Thus, it becomes obvious that barriers and expectations of the participants regarding the wearable technology have to be considered. When talking about perceived barriers and expectations that play a role in the decision of accepting a technology, it is important to consider what factors influence their perception of a technology and what factors play an essential role in the decision to use that technology. According to the Technology Acceptance Model (Davies, 1989), the perceived usefulness and the perceived ease of use lead to the intention to use a certain technology. However even a “useful” device might not be widely accepted due to its high perceived ease of use. The devices also need to be easy and quick to learn how to use, being as unobtrusive as possible (Sentosa & Mat, 2012).

Similar constructs can also be found in the Unified Theory of Acceptance and Use of Technology (Sentosa & Mat, 2012), which include performance expectancy and effort expectancy as influential for the use and acceptance of a technology. In addition to social influence, which refers to the amount to which significant others of a person think that he or she should use the technology, these two constructs are presented as indicators for the behavioral intention to use a technology. Furthermore, facilitating conditions, which are defined as the extend to which the user believes that the “organizational and technical infrastructure” of the technology is able to support its use, can influence the amount of acceptance and use of the technology. An example for facilitating conditions are whether the availability of support for a device, such as mobile internet, are available everywhere in the city. Also, the UTAUT also introduces four moderators for these aspects: “Gender”, “age”, “experience” and “voluntariness of use” (Venkatesh et al, 2012).

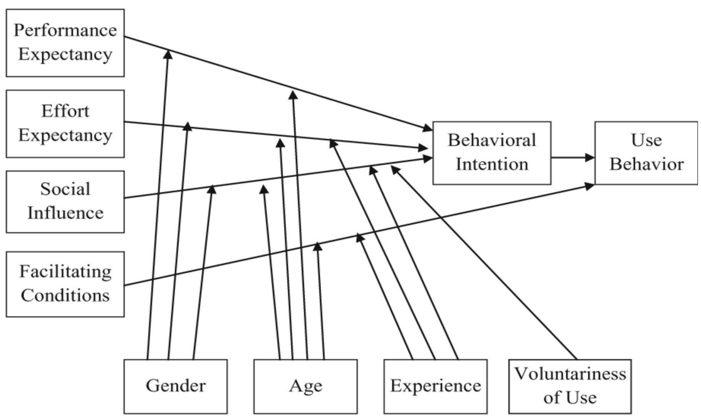

Figure 1.

Unified Theory of Acceptance and Use of Technology.

1.4 Privacy

Big Data combines (personal) data collected from all kinds of sources, like social media, purchase histories and healthcare records among others. There is no official definition of Big Data, although there are several proposals for a definition to be found: Wang and Krishnan (2014) describe Big Data as data sets that are too huge to be processed and analyzed by regular data management softwares. Its size is also the important benefit of Big Data: It facilitates research in regards to population trends, where samples are not needed since N=All, data from almost everyone in the population is included in these kinds of data sets (European Comission, 2014). Consequently, BANs (Body Area Networks), Big Data sets concerning physical conditions in real time, are promising points of interest in public health (Al Ameen, Liu & Kwak, 2012). It is being estimated that by 2020, 5,200 gigabytes of data will exist, for every existing human being on the planet, containing personal information. Notably, most of this information will not be created by the individuals themselves (eg. text documents), but that data rather will contain information about the individual that the person themselves do not create (Grantz & Reinsel, 2012). A substantial amount of this kind of data derives from the use of sensors, which are omnipresent in our society. For instance, a smartphone alone contains an array of different sensors, for instance, GPS, camera, microphone and accelerometer. By combining different kinds of data that were not compatible before the emergence of Big Data, it is possible to identify population trends on a large scale by exposing an individual's hidden behavioral patterns. This is possible, because modern devices containing sensors mostly are connected to the internet, storing (and possibly sharing) the data online (Mansour, 2016).

However, in a paper by the European Comission (2014) regarding the use of Big Data in public health, it is stated that there is no ideal way of preserving privacy when dealing with the data that is stored online yet. Currently, de-identification of the data by creating anonymous data sets, which is a way to insure the privacy in Big Data sets, is being questioned in its effectiveness, since methods emerged that can “re-identify” this data. Through the means of inference, this re-identification is possible, promoting “a false sense of security” (Nararayan & Felton, 2014). Thus, using wearables in healthcare raises questions in regards to the privacy and safety from abuse of this recorded sensitive information. Similarly, a study by Bietz and colleagues (2015) suggests that privacy and data ownership issues contribute to the challenges to adopting personal health data for research. Thus, using wearables in healthcare raises questions in regards to the privacy and safety from abuse of this recorded sensitive information. This is especially true considering that the data monitored by the wearable is saved on its cloud service online (Maddox, 2015). In the past, many concerns with privacy in regards to senor technology have been raised. For instance, where the data should be stored, who will be responsible for it, or who can have access to the data without the consent of the user of the wearable (Meingast, Roosta, Sastry, 2006). These privacy issues are especially relevant, considering the capacity that the government and other institutions have access to as far as surveillance is concerned. For instance, Power (2016) states in his paper that “technology has advanced to the point where George Orwell’s dystopian ‘Big Brother’ vision of a totalitarian state is possible.” Because of the privacy concerns that the immense amount of information generated by sensors, social networking sites and other sources raise, it is important to gain insight in the perceived privacy concerns of a potential user of a wearable device that is using sensors to record personal information while being connected to the internet. In the context of this study, additional focus should be directed to the measurement of sedentary behavior and physical activity in order to determine what is being perceived as a risk to personal privacy or well-being.

The decision of an individual to adopt a technology is dependent on their risk-benefit analysis. This is also referred to as the privacy calculus perspective (Li, Wu, Gao & Shi, 2015). Thus, should a potential user perceive a privacy related risk, they might still choose to engage in such threatening behavior if the perceived benefits outweigh this threat. On top of that, Xu et al (2009) introduce an extended model of the calculus perspective in regards to information privacy. According to this model, there are three privacy intervention strategies that may convince someone to share their data. First, *compensation* refers to the estimated value of information that an individual shares versus the expected outcome. If the outcome is deemed acceptable as an exchange for the information, the individual may be more willing to share the data. To begin with, there is *compensation* which means that the user of that technology requests a service, initiating the process themselves, for instance, asking a service provider to show the nearest restaurant and thereby sharing their location with that provider. Furthermore, the user of information technology can also be convinced to share data by ensuring procedural justice, eg. showing the user that their privacy rights are being respected and they are being related in a fair manner. This treatment is referred to as *procedural justice* and it greatly increases the perceived fairness of the treatment the individual receives. There are two intervention strategies that ensure procedural justice. First, there is self-regulations, which refer to a companies' internal promises to deal with shared data respectfully and to keep the received data save from abuse. Second, government regulations refers to government agencies trying to protect the information from illegal abuse and third parties taking advantage of the stored data. Notably, government regulations can only be linked to increasing willingness to share data with push technology, which refers to technology that does not ask for permission from the user, while self-regulations have proven to be effective with both push-and pull technologies. It may be important to identify what perceived privacy risks are prevalent among the population and under which circumstances they would consider using the device and thereby sharing their data.

1.5 Research Questions

In summary, physical activity as well as sedentary behavior are important health issues that impact public health significantly. This is especially true for the working population who are working in offices and other desk centered professions, where long hours of sitting are unavoidable. Through the means of the Persuasive Systems Design Model model, it might be possible to persuade the target group to decrease the unhealthy behavior. The PSD model can be integrated in an eHealth intervention that utilizes wearable technology.

However, it still is unclear what the populations' expectations and barriers for accepting this technology in the context of a healthcare intervention are. The same is true for perceived risks and concerns of information security when using the wearable. It is important to get to know what the perceived risks of privacy are prevalent among the population, especially since the laws and regulations regarding the subject of Big Data and online storage of personal data are still very unclear.

→ Subquestion one: What are the participants' expectations and barriers in regards to a wearable using sensor technology to measure their physical activity and sedentary behavior?

→ Subquestion two: What are the participants' perceptions of privacy issues and safety of their personal data recorded by the wearable?

2 Methods

2.1 Design

A qualitative research approach was chosen for this study. This was done in order to adapt to the exploratory nature of the research questions. Semi-structured interviews were conducted, dealing with perceived barriers and expectations of employees, in regards to wearable sensor technology that measures physical activity and sedentary behavior. Also, these interviews contained inquiries regarding perceived privacy risks in using sensor technology (Appendix A). This interview schema was designed in accordance to the UTAUT model. This model was used for qualitative research regarding facilitators and barriers towards accepting a technology before (eg. BenMassoud, Kahrraiz & MacDorman, 2011). Thus, the UTAUT can be considered appropriate for this type of qualitative research.

2.2 Participants

In total 12 Dutch lecturers and PHD students working at the University of Twente as well as lecturers working at the Saxion in Appledorn and Deventer participated in the study. Of these participants six were male and six female. They were contacted via email and personal visits. It also is to be noted that one participant was related to a researcher conducting the interviews. It was also paid attention to including participants working in different faculties and subjects.

The lecturers and PHD students were chosen because their occupation allow little inclusion of movement throughout the average day at work.

All of the 12 interviews were included in the analysis of this study, which generally is enough to reach data saturation according to a study by Guest, Brunce and Johnson (2006).

2.3 Procedure

During the interviews, the participants were asked to talk about their occupations at work and their experience with modern technology, like smartphones, laptops and most importantly wearable devices. Other topics that were asked about were their overall impressions of a wearable measuring physical activity as well as expectations regarding this device. On top of that, the perceived reliability of such a wearable device was asked for as well. Another topic was the manner in which the participants preferred to get feedback from the device. The same questions were asked for a wearable that measures the users' stress-level. Also, privacy issues like data ownership and security issues with the information recorded by the wearable were part of the interview. Finally, how the participant expects colleague's, family and friends opinions of a wearable were asked for (Appendix A).

Each subject was presented with a written informed consent, which provided permission to record the interviews and use them for this paper (Appendix B). All audio of the interviews derived from smartphone recordings. Each interview lasted between thirty minutes and one hour. The location of the interview was chosen at the subjects convenience, which often was the lecturers office or a room at the University of Twente as well as the Saxion of Appeldorn.

This study was submitted to the Ethics Committee of the University of Twente, specifically to the faculty of BMS (Behavioral Management and Social Sciences) and was deemed appropriate for conduction according to ethical standards.

2.4 Data Analysis

The recorded interviews were transcribed verbatim. Then, the transcripts were coded. Most of these codes were derived upon in a deductive manner. This is true for the following main codes: *Perceived Usefulness*, *Perceived Ease of Use*, *Facilitating Conditions* and *Subjective Norm*. Also, the following sub codes were chosen deductively: *opinion colleagues, opinion social circle, visibility*. These codes were created in accordance with the UTAUT model (Venkatesh et al, 2012), as well as the Technology Acceptance Model (Davis et al, 1989). The sub-codes integration with other devices, combination *with other functions, personal settings* and *object design* were chosen inductively. On top of that, the main code *Privacy* and its sub-codes *owner data, data storage* and *perceived risk* were chosen according to the Privacy Calculus model (Li, Wu, Gao & Shi, 2015).

3. Results

3.1 Information over the sample

The interviewed participants consisted of six men and six women. The average age of the sample was 39, the youngest participant being 24 and the oldest being 62 years old. Three of the participants were PHD students, while the other nine were lecturers. The demographic information is represented in Table 1.

Table 1.
Overview over the participants (age, gender, occupation)

Participant	Age	Gender	Occupation
1	26	female	lecturer
2	25	male	PHD student
3	42	male	lecturer
4	55	male	lecturer
5	38	male	lecturer
6	41	male	lecturer
7	42	female	lecturer
8	47	female	lecturer
9	44	male	lecturer
10	27	female	PHD student
11	62	female	lecturer
12	24	female	PHD student

The lecturers reported to have a large variety of work-related tasks, which made their amount of sedentary behavior as well as physical activity at work vary strongy:" *Dus nu zit ik bijvoorbeeld veel achter de computer, maar er zijn ook dagen waar ik echt van ron na hui ren omdat ik les geef dus het verschilt heel erg*"(P1). Thus, in different periods of time, there are different tasks for the lecturers to be done. Similarly, the amount to which the lecturers estimated their ratio between sitting and standing or walking while at work differently:"*Ik denk 30/70 procent. 30 procent zitten"(P4);* "*[...] nou zeker 65 procent zit en 35 procent sta*"(P8). Conversely, the PHD students almost exclusively were doing research in regards to their thesis. As a consequence, these participants reported to mainly be sitting all day:”*Ja, ik zit de hele dag en ik drink wel veel koffie en dat is mijn beweging, naar het koffieapparaat en eh, af en toe naar de printer”*(P2). Finally, five out of the twelve participants were already using wearable sensor technology. Three of these five reported to be using the wearable to measure their physical activity while jogging or cycling:”*Vermogensmeters met fietsen bijvoorbeeld. Met trapomwentelingen et cetera. Dat zijn dingen die ik over het algemeen dagelijks gebruik”*(P6). One other participant reported to be using an Applewatch, which they used to keep track of their amount of movement throughout the day:”[...]*ik hou er ook mijn dagelijkse beweegdoelen in bij, die beweegapp van Apple”*(P4). Last, one participant was using a wearable that counted the steps that the user takes each day, however, this participant was told to use it in terms of their work, thus did not choose to use the device on their own and rather related to research**.**

3.2 Expectations and Barriers regarding persuasive sensor technology

Table 2

Perceived barriers and expectations named by the participants regarding wearable technology measuring physical activity and sedentary behavior.

Topic	**Citation**
Barriers	
- wearable seen as a pedometer, which is useless when at work, since the perception is that there is not much room for change in their work-schedule	*“Ik heb bijna geen fysieke activiteit op mijn werk dus het is voor mij niet heel nuttig als die dan aan het eind van de dag zegt ja je hebt 100 stappen gezet. Ja dat weet ik zelf wel dat ik niet heb bewogen zeg maar. Daar heb ik niet zo een apparaat voor nodig” (P12)* *”Alleen je beweegt vaak niet, niet omdat je niet wilt bewegen, maar omdat je gewoon in een situatie zit dat je niet kan bewegen. Dat je gewoon, als dit interview 1 uur en 10 minuten duurt, dan moet ik gewoon die 10 minuten blijven zitten" (P5)*
- device intervening in their everyday behavior is being experienced as patronizing	*"Klingt betuttelend“- (P9); “dat is zo’n big brother gevoel. Dan zit er iemand mee te kijken. Je wordt gecheckt, gecontroleerd" -(P4)* *"Naja omdat ik dat zelf al gewoon wil bepalen. Zonder enige hulpmiddelen."- (P11)*
- wearable requiring attention of the user at work disrupts concentration at work	*"En op het moment dat ik in een situatie zit, waarbij ik niet weg kan, vind ik het eerder vervelend. Dan denk ik: jeetje, ja oké, ik heb een uur niet bewogen, maar ik zit in een vergadering van 2 uur en ik kan hier toch niet*

	weg" (P5) *"Ja het kan afleiden dus als ik aan het lesgeven ben, dan moet je niet ook nog, dan wil ik niet gebeld worden. Dan wil ik niet weten of ik genoeg beweeg. Dat wil ik allemaal niet weten want ik ben met lesgeven bezig.“ (P4)* *"Ik denk dat inderdaad het argument dan zou zijn ja, maar dan* *ben ik elke keer eruit of dan wordt ik elke keer gecorrigeerd of ik wordt uit mijn concentratie gehaald of iets dergelijks". (P2)* *"[…] maar dan ben ik elke keer eruit of dan wordt ik elke keer gecorrigeerd of ik wordt uit mijn concentratie gehaald" (P12)*
- being stigmatized as sick or obsessed with health by wearing the device	*“Een stempeltje van o ja wat is er met jou aan de hand dat je dit allemaal moet weten?“ P9* *"dit is een health nut, een gezondheidsfreak of juist deze persoon is ziek misschien." P3*
<u>Expectations</u>	
- providing teachable moments (tools, advice, insights etc) that allow the user to stop wearing the device and still benefit from using it (eg. Undesired behavior remains decreased)	*“Nee ja, ik denk, hoeft het niet jaar in jaar uit te doen [...]dan hou ik dat even een tijdje bij en dan is het oké. Dus dan is het weer even goed.” (P7)* *“Ik zou daar niet altijd zon ding met me hebben [...] meer als zon soort van leermoment” (P11)* ” *Niet iedereen heeft zo maar ik wil wel bewegen, maar hoe doe ik dat dan makkelijk? Dus daar zou ik nog wel een soort vrijwillig advies.*” (P9).
- wearable illustrating behavioral patterns for user to interpret, providing insight in unhealthy behavior	*“En volgens mij is het dan zo als je dat een tijdje hebt gedaan, dat je dan wel een soort van patronen kan herkennen” (P7)* *” Ja, kijk iedereen heeft een keer een goede dag en een slechte dag en dan kan je dat er mooi uit halen. Dan kan je zien van waarom heb ik eigenlijk een slechte dag gehad? Waarom doe ik dat?“(P6).* *„Wat, eh, ja in ieder geval wat.. eh... op welke momenten, dus misschien... beter nog wat lichamelijke activiteit kunt inbouwen, ik denk dat je dat kan leren.“ P11*
- Information recorded by the wearable should be made accessible in a way that the user can choose to consult medical	*“Dus misschien bij een arts [.,..] afspraak dat je kunt laten zien dokter kijk ik beweeg zo veel, om maar wat te noemen” (P3)* *”dat je bijvoorbeeld naar de arts kan gaan dat die meer inzicht heeft in wat je bedoeld (P1)”.*

professionals, providing additional information over the users' health	
- insight in the methods that the wearables utilizes for measurement are provided in order for the user to trust in these measurements	” *Nou, zo lang ik niet uitgelegd heb gekregen hoe er gemeten wordt, vertrouw ik het niet*.” (P4). *"Dus dan denk ik zo.... dat denk ik. Dus ik wil er weten op wat de meting dan berust voordat ik kan inschatten of het wel of niet betrouwbaar is, of die dat wel goed kan doen...."* (P11)
- medically approved devices perceived as trustworthy and useful, unlike “consumer products”	"*Ja ik, de ene kant vind ik een keurmerk prettig. Aan de andere kant vind ik een keurmerk ook niet meer dan een marketing tool“(P9).* *"als het een serieus product is dat medisch goed onderzocht is, dan, dan vertrouw ik het wel" (P3)*
-combination of different functions, quantifying the users' health, that the wearable is capable of is expected	*"Wat je zei van eerst stressmeten, misschien hoeveel energie je spendeert, hoeveel stappen je zet en hoe lang je al stil zit of zo. Dus dat zou dan een van die functies zijn op het apparaatje en als gebruiker kun je dan kiezen welke functies jij graag wilt gebruiken.“(P3);“Maar dan zou ik het voor mezelf wel snel combineren door het privé en werk hetzelfde apparaat, hetzelfde ding te gebruiken“(P6).*
- covert, neutral design of wearable is preferred, which does not immediately reveal the function of the device	*“kijk als je het meer een horloge-achtige vorm heeft, valt het ook niet echt op dat jij iets aan het meten bent [..] Hoe neutraler hoe beter“(P7)*

There were several barriers that the participants perceived in regards to using wearables. First, two participants viewed a wearable as a pedometer, which counts the steps that the user takes. Because of that, these participants did not expect the wearable to be helpful in decreasing this unhealthy behavior, since their main activity at work is of physically inactive nature. Due to this fact, the participants expected the quantification of the undesired behavior would only confirm what is already known, namely insufficient movement at work and not help them to change this behavior without stopping or interrupting their work. Second, three participants expected the wearable to prompt the user or give feedback whenever unhealthy behavior occurs, which was seen as patronizing, giving them a feeling of being controlled. Similarly, four participants expected the wearable to provide prompts and feedback to decrease unhealthy behavior as well, however, they saw these functions as obstructive, since it would disrupt their concentration and be counterproductive during meetings and other scheduled actions that would not allow being interrupted in order to deal with the feedback provided by the wearable.

Two participants expected the wearable to lead to some insight regarding the unhealthy behavior, but not as a constant reminder of it, but rather as a device that leads to a one-time teachable moment, helping the user to become more healthy by providing insights and tools that the user can adapt while wearing the device, which also allows the user to profit from these insights and tools after having stopped to use the wearable. In contrast to the participants expecting the wearable to obstruct their working flow, three participants expected the wearable to provide advice and tools over how to minimize the undesired behavior, improving the users' capacity to do so. Furthermore, the wearable was expected to provide insight in behavioral patterns, which would allow the user to identify problem areas themselves, as far as three participants were concerned. On top of that, five participants expected the wearable to have useful applications in providing additional information concerning unhealthy behavior to healthcare professionals, expecting personal benefits not only for themselves, but also to consult medically trained third parties.

Aside from the actual functions of the wearable regarding physical activity and sedentary behavior, there were barriers and expectations among the participants concerning the context of use of this technology. To begin with, there were concerns among four participants in terms of accuracy of measurement of the device. Two of these participants reported to only trust the measurements if they gained insight in how the measurement itself works. This mistrust was especially prevalent in regards to a wearable as "*consumentenproduct*" (P3) from a commercial firm as opposed to the wearable as a medical device. Furthermore, two participants reported to be reluctant to add yet another device that they have to carry around with them at all times, in addition to smartphones, laptops etc.

In terms of expectations, five participants stressed that the wearable should be designed in a way that it looks neutral and ordinary, for instance like a regular watch. Aside from that, the participants showed interest in wearables that combine several functions in one, including keeping track of eating behavior, or using it for jogging and cycling in their free time. This was also important in the participants' decision to keep using the wearable in the long term.

Three participants anticipated that wearing the device could still be linked to a stigma of being unhealthy, or conversely, being obsessed with health ("*health nut*", P3). Finally, the participants were more sensitive about wearing this kind of device in public, given that they do not wear the device in the context of a preventive intervention, but because of sickness.

3.3 Privacy concerns regarding information technology in the form of wearables

Table 3.

Participants' perceived privacy risks and perceived mediators for these risks.

Topic	Quote
Perceived risks	
- data collected by wearable being accessed and shared by the company providing the device for commercial benefits without permission of the user	[...] *ik zou het niet willen als de fabrikant van de apparaat of de software of iets dergelijks daar eigenaar van is*.“(P2) “[...] *maar dan ligt het toch heel erg aan de fabrikant of ik vertrouw dat die data bij mij blijft of dat ik geloof dat die ergens naartoe gestuurd wordt*“ (P12)
- healthcare providers and banks accessing information collected by the wearable and basing decisions regarding the user on the basis of eg. health or fitness	*“Zorgverzekeraars, ik denk dat dat heel heel erg slecht zou zijn, dan gaan de premies omhoog omdat je niet genoeg beweegd of weet ik veel, volgens mij moeten we dat echt niet willen*“ (P1) “*[...] je quantified self, dat de gegevens daarvan gebruikt worden om mij bijvoorbeeld in een risicocategorie in te delen of zo*“(P5).
Mediators for the perceived privacy risks	
- regulations that require anyone wanting to access the information to get permission from the user	“*Ik zou altijd de regie willen hebben over met wie ik de data deel. Dus ik zou een handeling moeten doen om de data te delen of ergens akkoord voor moeten geven*“(P5). *”ik zou zeggen jij bent de baas van je data [...]“(P3)*
- sharing with individuals that are bound to patient-	“*Dus dan heb je ook een soort van medisch-ethisch iets wat je dan beschermd, misschien ook gevoelsmatig*“ (P1)

confidentiality	*"Ik denk dat je dat alleen kunt afvangen met ethische codes, zoals een medische geheimhoudingsplicht*"(P5).
- making data accessible for trusted institution, specifically Universities, to enable research	*"Ik zou dat willen delen voor onderzoek of iets dergelijks, onderzoeksinstituten"* (P12) "*als het gaat om onderzoek, medisch onderzoek, wetenschappelijk onderzoek, ja dan wil ik dat beschikbaar stellen op het moment dat er een relevante onderzoeksvraag ligt*"(P4).

In regards to privacy and safety of the data that is being recorded via the wearable, the participants were concerned with who the owner of this data is. Commercially oriented companies were considered untrustworthy for being the owner of this data since these companies might sell it for their own profit. Moreover, five participants were concerned about third parties accessing their data to the disadvantage of the user. For instance, healthcare providers would be able to use this personal information to influence their decision on the amount of money that the client has to pay. On top of that, situations in which the participant is being evaluated, like asking for a loan or applying for a new job, were perceived as potentially troublesome, since accessing the personal information of the user might influence their decision as well. Thus, sharing the information with the employer is being considered as risky as well.

Despite the perceived risks, there were some conditions under which the participants reported to be willing to share their data. First, ten participants stressed that they would have to be in control over who the data is being shared with in order to be willing to use the wearable. These participants expected to initiate this sharing of data themselves or be informed and consent to it. Second, ten participants were willing to share their information with healthcare professionals, especially in the case of sickness. This was considered useful, especially in potential cases of sickness, because on the one hand, the user of the wearable profits from sharing the information, while on the other hand, doctors and other healthcare related professions were not considered threatening to the safety of their data, due to medical ethics and patient confidentiality. On top of that, four participants stated to be willing to allow research institutes to access the information in order to provide relevant information to the researchers.

4. Discussion

This study aimed at identifying expectations and barriers of employees regarding the use of wearable technology in an eHealth intervention. To begin with, there were concerns with the use of a device measuring physical activity in a job in which the employee is mainly physically inactive. Also, constant reminders and prompts were perceived as patronizing as well as obtrusive in regards to concentration at work and scheduled meetings, interrupting the user at inappropriate times. On top of that, some participants expected the use of wearable technology to be stigmatized with being sick, or conversely, being obsessed with health. In contrast, the participants expected the device to provide teachable moments, like advice and tools that help them improve their healthy behavior on their own, even after stopping to use the device. In addition to that, insight in the user's behavioral patterns regarding unhealthy behavior was expected, for estimation and improvement initiated by the user. Also, the recorded information was expected to be beneficial for the user in a healthcare related context, providing useful information for possible treatment in the case of sickness. Aside from that, the participants preferred a covert and neutral design of the wearable. The device was also expected to have many different health-related functions for the user to choose. Finally, the wearable was expected to be medically approved, increasing the participants' belief in usefulness and trustworthiness of the device.

Another goal of this study was also to determine what privacy risks were being perceived when using the wearable and what may factor in the decision to use the technology regardless of these privacy concerns. Privacy concerns among the participants were mostly related to the provider of the wearable sharing the data recorded by the wearable with third parties for commercial reasons. Also, there were concerns that information over the health of the participants might be used to their disadvantage whenever there is an important decision to be made over an individual, for instance when applying for a job, loan or health insurance. Consequently, the participants were interested in regulations that require any other party to get permission from the user to access the information. Also, the participants proved to be willing to share personal information with personnel bound by patient confidentiality and with trusted institutions, like universities, for the sake of research.

When discussing the results, it can be inquired whether these barriers and expectations would be conform with the implementation of wearable devices in an eHealth-based intervention in accordance to the PSD model. First, the participants expected the wearable to provide teachable moments, meaning that there was the expectation for the device to provide essential information and tools, to then not be used again. This is inconsistent with the notion that persuasion is an incremental process that is drawn out over an extended period of time. However, the amount of time that the participants are willing to use the device for might be influenced by two factors. The first is the implementation of different health-related functions of the wearable, dealing with stress levels and dietary behavior. This, according to the participants, could motivate them to keep using the device for a longer period of time. The second factor might be in the use of commitments. Since the participants expect certain insights and specific teachable moments, having the participants make commitments to achieve this goal might be helpful to motivate them to accept the fact that the process of persuasion cannot be achieved at once, but rather incrementally. This is supported by the findings of Bazerman, Gjuliano and Appelman (1984), who state that commitments that yield negative results are likely to cause the person that made the commitment to invest more resources and attention to change the outcome, thereby upholding their commitments.

Aside from that, the participants were expecting advice and tools that they could use on their own, without help of the wearable, for long term improvement of their physical activity and sedentary behavior. Also, they were aware of what the problem is and emphasized the expectation to increase their capability to deal with this problem, through the use of tools and advice. This indicates that a direct route of persuasion may be preferable among the population of lecturers, who actively want to reflect on unhealthy behavior and adapt accordingly in order to minimize it. Another issue that has to be dealt with is the obstructiveness of the device. The participants were mainly concerned with prompts and feedback of the wearable that would disrupt their concentration while at work, or occur in inappropriate situations. Thus, it may be advisable to limit the extend to which the wearable intervenes immediately when unhealthy behavior occurs, but rather giving information over the unhealthy behavior afterward or on demand of the user. This is especially relevant considering the fact that the participants expect to remain in control of decreasing their unhealthy behavior, feeling patronized by “commands” of the wearable regarding where and when to move. Another alternative to this issue is creating a suitable work environment that leaves room for these changes: In their research model of variables affecting end-user satisfaction of information technology, Mahmood et al (2000) refer to this as *organizational support,* meaning that the employee might prevent problems of disruption of the user at work by taking the use of the technology into consideration, altering the content of the everyday work in favor of the use of the technology. An example for that are *management measures*, which are implemented in many health-related interventions (*eg*. Workplace Stress: A Collective Challenge, International Labour Organization, 2016). *Management measures* are meant to “encourage management support for behavioural adjustments to the organization“(Marshall, 2004). Thus, the term refers to engaging in discourse with employers and management to adapt conditions at the workplace, facilitating the adaptation of healthy behavior among their employees. Thus, potential employers might be interested in these changes, since the health-related effects of the intervention of the participants influences productivity and absence of workers due to sickness. Considering that worker absenteeism due to health problems cost American employers a total of 226 billion dollars each year (Steward et al, 2003). This is supported by the findings, that indicate that providing for these kinds of support needs strongly increases the user-satisfaction (Mirani & King, 1994). Similarly, user training is essential to user satisfaction for information technology as well. The lack of this training is often the reason why information technology fails (Igbaria et al. 1995). Incorporating training may help increase the users' belief in being able to use the technology. In the case of the participants, this training may help convince those who did not see any use in the technology and who did not expect the wearable to help decrease their unhealthy behavior.

Aside from concerns regarding the wearable itself, aspects dealing with privacy and the personal health-related information that the wearable measures have to be considered as well. The participants were concerned with unauthorized distribution of their personal data by the provider of the wearable, for the sake of commercial profit. On top of that, the participants were also concerned that third parties like healthcare providers and banks might access the information, basing decisions that deal with the user on these health-related records when deciding, for instance, whether to grand the user a loan or not. Thus, it is important to mediate that perceived threat to their privacy. This can be done by implementing different intervention strategies, as it was introduced with the extended privacy calculus perspective. For instance, bot self-regulation and government regulation strategies, that are meant to increase the perceived fairness of treatment of the user by acknowledging respect and security (procedural justice) when dealing with personal data. Notably, these strategies include notifying the user whenever their data is being accessed. This is conform with the participants' expectation to be consulted whenever their personal data is being accessed and consequently may be an effective means to decrease the perceived risks of the participants (Xu et al, 2009). On top of that, not all participants believed in the usefulness of the wearable, mainly due to their perceived incapability to adapt their amount of physical activity and sedentary behavior at work. Since this negatively affects the expected outcome of using the device, this might contribute to the participants not accepting the device as an effective mean for an intervention, while also decreasing the amount of perceived privacy risk that the participants are willing to accept. This is because the outcome is not perceived to be worth to expose themselves to their perceived privacy risks. However, as it was mentioned above, user training and organizational support present promising measures to increase the perceived value of using the device among the population.

The results of this study in regards to privacy raise interest in electronic Health Records (EHR). These are electronic records of patients containing health-related data that are owned by and stored at a hospital (Angst and Agarwal, 2009). Since the participant showed overall trust in healthcare professionals and also stated to be willing to share the data with trusted institutions, this may be a suitable alternative source to save the health records of the users of information technology like the wearable. The fact that a study by Angst and Agarwal (2009) has indicated that even people strongly concerned with privacy issues in regards to EHRs are receptive to positively framed arguments, which could alter their opinion about that technology, supports the notion that information technology can still be implemented despite perceived privacy concerns: “This provides some evidence that privacy concerns, while a salient barrier, may not be enough to halt the acceptance of electronic health records“. Argument framing refers to the credibility and strengths of a message. This aspect is central to the concept of persuasion. Based in these indications, the applicability of EHR in the field of healthcare interventions based on sensor technology might be an interesting subject for future research (Angst and Agarwal, 2009).

5. Limitations

Examining this study critically, there are some factors that might have influence the results. First, the professions of the participants need to be considered. Lecturers varied strongly in their tasks and consequently also in the amount of movement needed to deal with these tasks that they included in their everyday work. Thus, some participants reported to sit much less at work in comparison to standing or walking. This can influence the participants' perception of wearable measuring physical activity or sedentary behavior. In contrast, the PHD students were much less physically active and were dealing with the same tasks all day at work, namely doing research and writing their thesis. These differences arise the question whether the difference in occupation is too significant to consider PHD students in the same sample as lecturers. On top of that, in regards to perception of privacy, the participants were also interviewed about a wearable measuring blood pressure to determine the stress level of the user at work during the same interview. Afterward, the participants were asked about privacy related aspects. Notably, there was no discrimination between wearables that measure physical activity and wearables that measure blood pressure made in the interviews. Since the participants repeatedly claimed that their blood pressure was considered more sensitive information that physical activity, this might have influenced their answers on privacy related aspects.

6. Conclusion

This study provided an insight in perceived expectations and barriers in regards to wearable sensor technology. Although this device clearly is suitable to be used as persuasive technology in an eHealth intervention, there were concerns among the participants regarding the w and privacy related issues that are tied to the use of it. Among those perceived barriers was the fact that a device intervening in everyday behavior was perceived as patronizing or disruptive to the participants' concentration at work, as well as a perceived stigma of being sick or obsessed with health was anticipated. The barriers and expectations that were identified are conform with constructs of theories regarding the acceptance of (information) technology among a population. Based on the results, future research might deal with strategies to mitigate or avoid these barriers, for instance the use of organizational support and user training.

Regarding privacy concerns, the perceived risks concerned the provider of the wearable abusing the personal data for commercial purposes, as well as unwanted third parties accessing the users' personal health records at the disadvantage of that user. These risks could reportedly be mitigated by governmental- and self-regulation, which is consistent with the extended privacy calculus perspective of information technology. In the future, it might be interesting to examine electronic Health Records (EHR), since it shows to have interesting implications with the perceived privacy risks of the participants.

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Appendix A

Interviewschema

Voordat we beginnen, mag ik u of jij zeggen?

Demografische gegevens

- Wat is uw leeftijd?
- Wat is uw geslacht?
- Wat voor beroep doet u? (ook vakgroep/faculteit)

– Hoe veel uren werkt u per week?

- Hoe lang doet u dit werk al?

Ervaring met technologie

- Welke moderne technologieën gebruikt u in uw dagelijkse leven? (denk hierbij aan bijvoorbeeld smartphones, tablets, computers)
- Hoe vaak gebruikt u deze apparaten?
- Voor welke activiteiten gebruikt u deze apparaten?

Ik ga nu een voorbeeld noemen van een draagbaar apparaat dat op de werkvloer gebruikt kan worden.

Werkstress

Werkstress is een veelvoorkomend probleem in Nederland. Stel, er is een apparaat wat je aan je pols draagt en wat je hartslag en bloeddruk meet. Dit zijn indicatoren die werkstress kunnen signaleren.

- Als u dit zich voorstelt, hoe denkt u hier in de eerste instantie dan over om zo een apparaat te gebruiken op de werkvloer?

- Als het apparaat feedback kan geven over de gemeten waarden, hoe zou u dat willen krijgen?

→ Doorvragen: Wanneer/ in welke situaties zou u feedback willen krijgen?

Hoe zou u omgaan met de feedback?

- Hoe kijkt u naar de capaciteiten van het apparaat?

-> Doorvraag: Hoe betrouwbaar ziet u de gemeten waarden?

- Hoe zou zo'n apparaat invloed kunnen hebben op de werkstress?

→ Doorvragen: Wat zou u graag van het resultaat willen/ Wat voor invloed kan het hebben als je er gebruik van maakt?

Fysieke activiteit

Een groot deel Nederlanders voldoet niet aan de minimale norm van beweging. In het soort werk wat u doet, is stilzitten achter een bureau veelvoorkomend. Stel, er is een apparaat die je aan je pols draagt en die je fysieke activiteit kan meten.

- Als u dit zich voorstelt, hoe denkt u hier in de eerste instantie dan over om zo een apparaat te gebruiken op de werkvloer?

- Als het apparaat feedback kan geven over de gemeten waarden, hoe zou u dat willen krijgen?

→ Doorvragen: Wanneer/ in welke situaties zou u feedback willen krijgen?

Hoe zou u omgaan met de feedback?

- Hoe kijkt u naar de capaciteiten van het apparaat?

-> Doorvraag: Hoe betrouwbaar ziet u de gemeten waarden?

- Hoe zou zo'n apparaat invloed kunnen hebben op de werkstress?

→ Doorvragen: Wat zou u graag van het resultaat willen/ Wat voor invloed kan het hebben als je er gebruik van maakt?

Vragen over de twee voorbeelden

Houdt bij de volgende vragen de voorgaande twee voorbeelden van werkstress en fysieke activiteit in gedachten.

- Hoe denkt u dat uw collega's/ werkgevers naar het gebruik van dit soort apparaten kijken?

→ Doorvragen: Hoe kijkt u naar het dragen van zo'n apparaat in hun bijzijn?

- Naast collega's, hoe denkt u dat uw sociale kring hiernaar kijkt?

Doorvragen: Familie/vrienden

- Wie mag er inzicht hebben in de verzamelde data (Zoals hartslag/ beweging)?

→ Doorvragen: Waarom? Hoe komt dit?

- Wat vindt uw ervan dat dit soort data ergens opgeslagen wordt?

Eventuele toevoegingen

- Heeft u nog iets toe te voegen aan het interview wat nog niet aan bod is gekomen?

Dan is dit het einde van het interview. Bedankt voor uw deelname.

Appendix B

Informed consent

Beste deelnemer,

U bent gevraagd om deel te nemen aan ons onderzoek. Wij zijn Frederik Igel en Paulien Pakkert, derdejaars psychologiestudenten van de Universiteit Twente. We zijn momenteel bezig met ons afstudeeronderzoek over eHealth en persuasieve technologie. De bedoeling van dit onderzoek is om erachter te komen wat de meningen van mensen zijn over persuasieve technologie en het gebruik tijdens het werk.

We zullen zometeen een interview houden van ongeveer één uur. U mag hierbij eerlijk antwoord geven. Er zijn geen goede of foute antwoorden. Wij zijn enkel geïnteresseerd in uw mening. Ook als iets tijdens het interview niet duidelijk is, mag u gerust vragen. De interviews zullen opgenomen worden met de telefoon en later uitgeschreven worden. Deze volledige transcripties en geluidsopnames van de interviews zullen voor niemand anders dan de onderzoekers in te zien zijn.

Deelname aan dit onderzoek is vrijwillig. U kunt op ieder gewenst moment stoppen met de deelname. De interviews zullen achteraf geanonimiseerd worden. Dit betekent dat wij namen weghalen uit de interviews. Ook zullen wij van de demografische gegevens alleen gemiddelden van alle deelnemers samen in ons onderzoek publiceren. Quotes die wij eventueel gebruiken in ons onderzoek zullen niet naar u terug te voeren zijn.

Als u na het onderzoek nog vragen heeft, kunt u altijd een e-mail sturen naar één van de onderzoekers.
Paulien Pakkert: p.pakkert@student.utwente.nl
Frederik Igel: f.igel@student.utwente.nl

Ik heb het formulier gelezen en geef toestemming voor het onderzoek,

……………… ………………

Datum *Handtekening deelnemer*