SUMMARY

The aim of this paper is to design technology to reduce prejudices against Syrian refugees in Denmark. To do so, we created an application for listening to stories about Syrian refugees while walking. For this, we attempted to answer our main question: "*How can prejudices against Syrian refugees be reduced through the use of technology?*"

This technology is designed based on the following theories: *Contact Theory* and A*ffective Process Regarding Empathy and Perspective*. Contact Theory suggests providing contact between two different groups to reduce prejudices if certain conditions are fulfilled. For this, we included in the technology stories told by Syrian refugees, as well as information regarding their lives before and after the war, how they fled from war, their lives in Denmark, and the struggles they face in Denmark, since indirect contact can be created by newly acquired knowledge about the other groups.

In regard to the theory Affective Process Regarding Empathy and Perspective, it proposes to put the prejudiced group in the place of the stigmatized group in order to create empathy and decrease prejudices. Therefore, the stories, as well as some features provided in the technology, are meant to create empathy in the participant. The mentioned theories were considered when designing and developing the recreational mobile application called "Walking in my Shoes".

As some researchers suggest, we created a technology that includes features to promote the use of the application when walking, to increase concentration while listening to the stories. In addition to this, it was important to motivate a diverse group of persons to use the application since not everybody was interested solely on the topic of Syrian refugees.

The application was evaluated using both quantitative and qualitative approaches. Regarding the quantitative approach, the aim of using the Prejudiced Attitudes Test (TAP) was used to measure the participants' prejudices before and after using the application in order to see if their results were different after the use of it. The TAP questionnaire is conformed by 3 dimensions, that together make the Global TAP. The results of the TAP were then included in the Paired Sample t-test, which gave us an insight into the significant differences in the participant's prejudices, before and after the use of the application. The cognitive and affective dimensions from the TAP showed a significant difference, however, the behavioral dimension did not show a significant difference according to the Paired Sample t-test. In addition to this, it was found that 81% of participants reduced their prejudices after the use of the application.

In order to complement the data from the statistical results, we also conducted semi-structured interviews. The interviews gave us an insight into the participants' experiences and opinions about the use of the application and the stories as well as the attitudes towards Syrian refugees.

In the qualitative results, the participants expressed that their positive attitudes towards refugees were due to various factors such as their positive prior knowledge or relationships with refugees. Therefore, they were able to receive new knowledge about the Syrian refugees by using the application. Nonetheless, there were also some participants who had a negative impact when using the application. However, according to the Paired Sample t-test, this negative impact was not significant. These participants mentioned in the interviews that they were having negative experiences with this group of people or were receiving negative information about them from the media

before the use of the application, which also correlates with other researches aimed at the reduction of prejudice. For example, one study mentions that a change in negative attitudes requires high motivation.

Lastly, we discussed the implications for design and research and briefly mentioned the limitations of our study. In addition to this, we conclude that in order to design a technology to decrease prejudices, one should consider the use of narrative as well as certain features that, based on the theories mentioned earlier, could stimulate empathy and create indirect contact by providing positive information about Syrian refugees.

Walking in my Shoes: Designing Technology to Reduce Prejudices

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ABSTRACT

Due to the Syrian crisis, many people have fled from their country, some in direction to European countries such as Denmark. However, they often face different challenges upon arrival. One of these challenges, is the existence of negative attitudes towards refugees. This often appears to be an obstacle when trying to integrate into society. This study presents how a technology can be designed in order to reduce prejudices against a stigmatized group, in this case, Syrian refugees. To achieve this, a mobile application called Walking in my Shoes, has been developed and tested on people in Denmark by using different theories such as Affective Process Regarding Empathy and Perspective and Contact Theory. According to our findings, we concluded that 'Walking in my Shoes' made a significant change on participants' prejudices since most of them were showing lower prejudices after the use of the application.

Author Keywords

Refugees; empathy; contact theory; Syria; narrative; prejudice reduction

INTRODUCTION

According to the United Nations [24], millions of Syrians have been forced to escape from their homes due to the crisis that Syria endured. In addition, most refugees have fled to neighboring countries such as Turkey and Lebanon [24], however, many chose to seek refuge in Europe. Nowadays, Syrian refugees face many challenges upon arrival to Denmark regarding cultural differences, language, and integration. The negative image of refugees created by the media has deteriorated the views some people in Denmark have towards refugees from Syria and have created a negative generalization of refugees in Denmark [4].

In our previous study [4], we explored the kinds of prejudices that are present in Denmark, how they are created and some ways to reduce them by the use of relevant theories such as: *Modification of categories, Affective Process Regarding Empathy and Perspective and Contact Theory*. For this, comments from diverse Danish pages on Facebook were analyzed to get a deeper understanding of prejudices and what might trigger them. From our previous study [4], results showed different prejudices against refugees in Denmark, moreover, it also pointed out different approaches to reduce prejudices. One of them is by Morales et al. which state that empathy can be used to understand *"the act of perceiving, understanding, experiencing, and responding to the emotional state and ideas of another person."* [18]. This approach claims that the stimulation of empathy towards a stigmatized group can help to reduce prejudices.

Therefore, this study aims at exploring whether the use of technology can help reduce prejudices by stimulating empathy and indirect contact. For this, a prototype called 'Walking in my Shoes' was developed, deployed and evaluated. Walking in my Shoes is a recreational application in which the participant can listen to stories from refugees while walking. In this prototype, two refugees from Syria shared their real-life stories and each story ends with a question for the participant to reflect on the given situation. Our goal, as the name of our application suggests, is to allow participants to put themselves in the refugee's shoes to increase their empathy and decrease potential prejudices.

The aim of this paper is to answer the following research question: *How can prejudices against Syrian refugees be reduced through the use of technology?*

Prejudices can eventually evolve to racism and discrimination [18], therefore it is important to find ways to tackle these issues and try to reduce them. Nowadays, there has been some research in the area of Human Computer Interaction (HCI) about the role of technology in interactions between persons of different ethnicities, as well as the reduction of prejudices [17, 20]. Therefore, we feel motivated to further investigate in this area since we consider technology beneficial in facilitating the access of information. In addition to this, by designing such technology, we could help educate people about minorities in order to reduce prejudices.

This paper is structured as follows. First, related work is presented. Then the process of collecting the stories is described as well as the process of developing Walking in my Shoes and its functionality. Furthermore, our study and method followed by our findings will be presented and lastly, we will discuss our findings and implications of this study.

RELATED WORK

Building on from our previous work [4], in which we explored what kind of prejudices are present on social media in Denmark, how they are formed and why, and suggested ways to reduce prejudices through technology, a number of theories were mentioned. For instance, Allport's Contact Theory [2] indicates that negative attitudes towards minorities can decrease when both groups have contact with each other. Contact between groups must fulfil certain conditions to achieve positive results, otherwise the prejudices could become stronger [2]. The contact does not

need to be physical. In Brown and Patterson [6], three types of indirect contact which are: extended, vicarious and imagined contact are mentioned.

Extended contact is the knowledge that a person from the in-group (in our case, the people in Denmark who are not Syrian refugees) has a close relationship with someone from the out-group (in our case, Syrian refugees). Vicarious contact is mainly the observation of an inter- group interaction. This can be achieved through media. Lastly, imagined contact is when a person imagines contact between different groups [6]. Crisp and Turner suggested that this type of contact can lead to the improvement of attitudes towards stigmatized groups by just imagining contact between them [9]. Indirect contact, according to Allport, could also lead to reduce prejudices as he considers that it could be the first step in creating contact between groups [2]. In connection to this, a study by Conger et al. offered a hypothesis stating that negative emotions related to race would increase with the frequency of negative events or experiences related to race and would decrease if these events were positive or neutral. Results from this study supported the connection between negative emotions with negative personal experiences. Thus, in order to reduce these negative emotions, this study suggests to not only consider the person's direct experiences, but also their exposure to portrayals from the media [8].

Another theory mentioned in our previous work [4] is Affective Processes Regarding Empathy and Perspective which can be used to reduce prejudices by letting a person adopt the perspective of another one from an out- or stigmatized group. The person then changes attitudes towards the whole stigmatized group, as the person's feelings become generalized. This is because people tend to generalize feelings towards one single person from the stigmatized group, into feelings towards the entire stigmatized group [18].

In this study, the aforementioned theories will be considered to design, deploy and test a technology to answer our research question.

Empathy and HCI

Literature regarding empathy and HCI mostly focuses on the importance of empathy when designing for users. However, in connection to this study, the focus will be on literature regarding the creation of empathy between users, the reduction of prejudices and indirect contact.

Empathy involves affective and cognitive components. According to Miklikowska [17], the cognitive component is defined as the ability to understand other people's experiences without raising personal emotions. The affective component appears when the individual takes the emotions of the other and subjectively experiences and shares the other's psychological state or feelings [17]. This state can lead to empathic concern, also called sympathy, which has been defined as concern for other people's welfare [13].

A study by Marcel Neuenhaus and Maha Aly [20] focused at developing a concept called 'Empathy Up' to increase empathy and attempt to reduce German people's prejudices against Syrian refugees. This was achieved by the development of a geolocation-based mobile game that both, the Germans and Syrian refugees played to understand more about Syrian culture, experience what refugees have gone through and, at last, find each other to achieve real, direct contact. This paper showed positive results for increasing empathy and, indirectly, reducing prejudices by the exposure of Syrian culture. The users' prejudices against refugees were minimized, and they were more willing to get to know them in a positive way [20].

Another research that was done in order to change attitudes towards a group of people has been made by Nili Steinfeld with the purpose of changing views and opinions about sexual harassment and promoting empathy by means of Virtual Reality. To achieve this, she collected testimonials from employees who reported harassment and adapted them into a screenplay. The results showed a decrease in stereotypical views of sexual harassment. Furthermore, the results also showed the important role of storytelling to change attitudes [23].

In addition, Mckeown stated the importance of storytelling to increase empathy and trust, however, he also mentioned that it is important to recognize what a good story is, as otherwise hostility would increase [16]. For example, a research by Skaaras et. al. studies the development of a mobile application to collaboratively construct a story. By this, the users would put themselves in the shoes of the character in the story, which can increase their empathy. This study was evaluated on groups of Norwegian teenagers and showed positive responses in initial experiments [22].

OUR STUDY

The application consists of two stories from Syrian refugees living in Denmark who volunteered to share personal information such as their memories, opinions, and experiences of being refugees in Denmark. The idea is that participants, while listening to the stories, would empathize with refugees and receive information about them. This way their prejudices would be affected. This is based on the theories from related work called Affective Process Regarding Empathy and Perspective and Contact Theory [4].

In order to gather the stories to be used in the application, we contacted two Syrian refugees from our network and asked whether they would voluntarily want to have a personal interview with us. We then conducted semi-structured interviews with each of them. We gave them the freedom to choose where they wanted the interview to happen as it was important for us that they felt comfortable as the nature of the stories was delicate.

As mentioned earlier, empathy can be facilitated by storytelling [20], which is why the interviews were then rearranged and written as stories. Once the stories were ready, questions were made in accordance to the story and added to certain parts of each story. This was done since reflection and empathy arise when a person sees things and events from another perspective by role-taking and identifies with the situation [15].

Subsequently, Danish- speaking people from our network were randomly selected to confirm that the stories and

questions were understandable both in terms of language and narrative.

Lastly, two non- native persons from our network were asked to read the stories and questions to be recorded. They were chosen as their Danish did not sound native. This was done to add more credibility to the stories and give the sense that it was a refugee telling their story. The stories have diverse content such as explaining how and why they came to Denmark, their experiences with war, things they miss from Syria such as music or food, the places they liked to go while they were living in Syria, how those places have been affected by war, and the good and bad experiences in Denmark. The application consists of two stories. One divided in nine parts and the other one divided in ten. Each part lasts approximately two to three minutes. Both stories together last around one hour.

The Walking in my Shoes prototype

The prototype starts by providing the option of choosing two stories. Once a story is chosen, a map would appear together with the part of the chosen story.

After each part of the story, a pop- up window appears with a picture related to the story. This was made to help visualizing the struggles of fleeing a country in war. After certain parts of each story, self- reflective questions were added to the application. Therefore, we made sure that the questions were open and that they referred to the listener, an example of this is: "*If you would have to flee from Denmark, what do you think would be the most difficult part of it?*". The application also provides the option of answering the questions from the audios by using Google Docs once the participant is done listening to the stories.
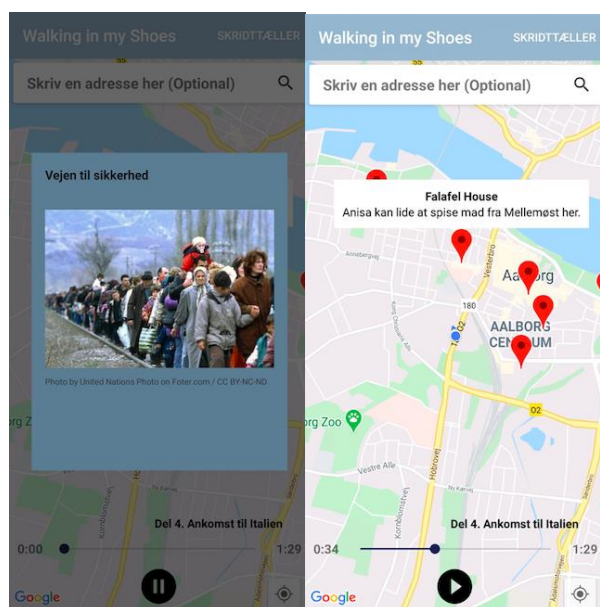

Figure 1. An example of the Walking in my shoes interface

That being said, and based on previous work [4], different research highlighted that people have prejudices because of lack of information about the stigmatized group. Therefore, a feature in the application was included where links are provided to the participants, which appears once a story is over. This is done to provide information about Syrian culture. The links are related to the stories and consist of Syrian music, recipes, festivities, and a video with pictures of Aleppo before and after the war.

Scientific research has shown that "*individuals are more likely to have better mental focus and concentration when engaging in structured physical activity*" [10]. Hence, it was decided to design the application containing features that allow the participant to facilitate the use of the application while walking, as it was argued that it would increase their concentration for listening to the stories. In order to facilitate navigation while walking, a map with functions from Google Maps was included in which the participant can see their location and a search bar for directions to find different places in Denmark. Besides, the map includes markers that points at places in Aalborg and Hobro where Ahmad and Anisa (the characters mentioned in the stories) liked to visit. This was implemented to provide information that could help reduce prejudices [18]. This was done to show to the in-group that refugees possibly go to similar places as the participants, and by then, reduce possible differences between them. Lastly, a pedometer that counts the number of walked steps was also implemented to motivate walking as an activity.

METHOD

In this study, mixed-method techniques were used combining elements from quantitative and qualitative research to expand our scope. In this context, semi-structured interviews and questionnaires were used. The aim of using a quantitative approach is to measure the participants' prejudices before and after using the application to identify the impact of it. The qualitative approach was used to complement our data by gathering more information about the subject and deepen our understanding about the participants' opinions and points of view, as well as to understand the effect of the technology.

Measures

A questionnaire which is based on a quantitative test called "*prejudiced attitude test*" (TAP) [21] which uses a 5- point Likert scale, has been used for the measurement of prejudices in our study. In the TAP, prejudices have been operationalized from the combination of three variables: *Cognitive, Affective,* and *Behavioral* [21]. The Cognitive component (in our case, the participant's opinion about Syrian refugees) refers to the description of the out-group by the group's characteristics or cultural differences. The Affective component (in our case, the participant's emotion towards Syrian refugees) measures the positive and negative emotions which are considered subtle. Lastly, the Behavioral intention (in our case the participant's social distance preference from Syrian refugees) refers to the social distance preference from the out-group to the in-group. It also refers to the intention of maintaining relationships with the out-group [21].

A global TAP score is obtained by the sum of each component, which means that each component has the same influence in the TAP. A Global TAP score ranges from three to fifteen (3 indicates no prejudices and 15 indicates high

prejudices), and each component ranges from one to five [21].

In regard to the qualitative analysis, we conducted semi-structured interviews with our participants after using the application. Open-ended questions were asked to encourage them to answer using their own words and to obtain more information about their experience of using the application and their attitudes and feelings towards the Syrian refugees and the stories. The semi-structured interviews were based on an interview guide that can be found in Appendix 3.

Participants

The study was conducted on 21 participants, which consisted of 7 men and 14 women between the ages of 18 - 74 from different geographical locations within Denmark. They were recruited from our network by snowball sampling and by posting on different Facebook groups as it allowed us to reach a larger number of participants. We offered them a brief explanation of our study, and the only requirements to them, were that they were living in Denmark and understood Danish. This was taken into consideration as the application and stories were in Danish, and the refugees in which the stories were based on, are currently living in Denmark.

Out of the selected participants, 18 agreed to have an interview with us, which was conducted online.

Demographic information about the participants can be found in Appendix 1.

Setup

Once our prototype was tested and the improvements were implemented, we proceeded to release the application to our participants. Participants were given an ID number in both questionnaires (pre- and post- test) to facilitate the analysis of the findings.

The questionnaire (pre-test) was then sent to our participants, together with an explanation of how the study was going to take place. After approximately three days, a mail with the link of the application was sent to the participants with more information about the study. The purpose of our study was not revealed, as it might influence the results. The participants were given the opportunity to try the application for an approximate of five consecutive days, but longer if they wanted. Once done, they were sent the TAP questionnaire again (post-test).

Due to the lockdown in Denmark because of COVID-19 at the time of this study, it was difficult to conduct interviews face-to-face. Therefore, the interviews were conducted by phone, Skype, and Facebook.

Data analysis

The first time the TAP was provided to our participants was before trying the application (pre-test), and then, after trying the application (post-test). The results of both the pre- and post-TAP tests were inserted into an Excel document using the participants' IDs. The average was calculated from each participant both pre- and post-test. After having the TAP results from the participants, the next step was to statistically analyse and interpret the data using paired sample t-test.

Paired Sample t-test is a statistical procedure which is used to statistically analyze and interpret quantitative data [14]. In our case, we used it to analyze the participants' results who answered the TAP questionnaire twice, in order to see if the differences in these results are significant.

Using SPSS, we were able to identify the significant difference between two means.

Regarding the qualitative analysis, prior coding related to the existing framework (Contact theory and Affective Process Regarding Empathy) was used [11]. The process was iterative, until the point of saturation was reached. In this analysis, our aim was to understand if and how the application made an impact on the participants' prejudices. According to the participants' discourse, we divided their expressed thoughts based on the framework mentioned above.
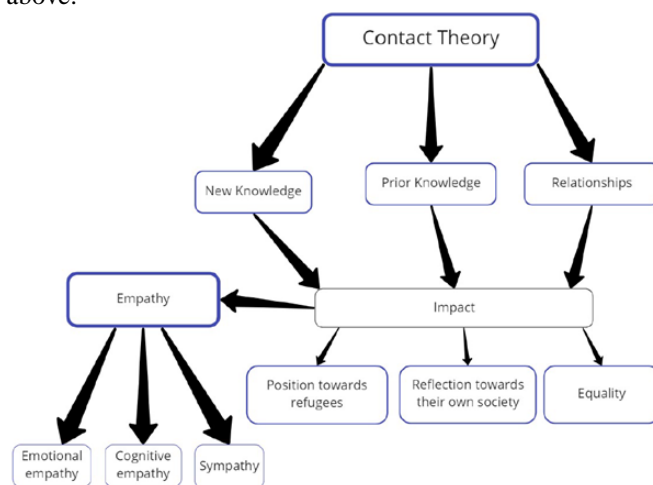

Figure 2. Categories and subcategories based on Contact theory and Empathy, and the relationship between them

Figure 2 presents the categories and subcategories based on the theories.

Based on Contact Theory, *New Knowledge*, *Prior Knowledge* and *Relationships* are variables that can make an effect on participant's views towards refugees after using the application (this is expressed by the arrows in the figure). These categories make an impact on the following categories: *Position towards Refugees*, *Reflection towards own Society*, *Equality* and *Empathy* either by changing their attitudes, making them reflect or feel empathy, which are also related to Contact Theory.

Empathy is also related to the theory Affective Process Regarding Empathy and Perspective. *Empathy* is having three subcategories, which are based on the different types of empathy: *Emotional Empathy, Cognitive Empathy and Sympathy.*

FINDINGS

Our findings showed that our participants were positive towards the application, since in the interviews, participants were asked whether they would use the application if it was not for the study. All participants expressed that they would use it. Even though thirteen participants expressed that they did not use all features, all participants indicated that they listened to both stories. However, eight participants

mentioned wanting more stories, as the application contained only two. Furthermore, when using features such as the pictures, links and markers, six participants showed signs of empathy and reflection

Quantitative findings

According to the Paired Sample t-test results, the three different TAP dimensions made an impact in different ways on people's prejudices. Since the number of our participants is 21, our df (Degrees of Freedom) is 21 minus one, therefore our df is 20. By using the df according the Student's Distribution Table, our Critical Value (CV) is 2.086. To be able to declare that the values obtained are significant, the t value needs to be larger than the Critical Value. Alternatively, the p-value must be less than 0.05 [12]. Given the data in SPSS, the cognitive dimension showed a significant difference in the results of the pre- and post- test, with a p= 0.01, t (20) = 2.837. This means that there was a significant difference in the cognitive dimension in the TAP scale before and after the use of the application. Following with the affective dimension, there was a significance p = 0.006, t (20) = 3.099 which means that the application had a significant effect in the affective dimension. Regarding the behavioral dimension, the p-value is p = 0.7 and a t (20) = .271, which means that the application did not have any significant effect in this dimension since the p- value is more than 0.05. Lastly, the global TAP result, which is the sum of the 3 dimensions, had a p= 0.007 and t (20) =3.008, which indicates that there was a significant effect in the prejudices of the persons who used the application. It is crucial to mention that the TAP as a whole measures how strong prejudice is. The greater the prejudice is, the larger the number will be, and it is the same for its 3 dimensions. In our analysis we perceived, that the means from the TAP, as well as the means of all the other dimensions, got fewer points after the use of the application. Therefore, we can declare that the application made an effect on our participants, as most of the people that used it, reduced their prejudices in general, and the areas that were significantly impacted are the cognitive and affective areas from the TAP scale.
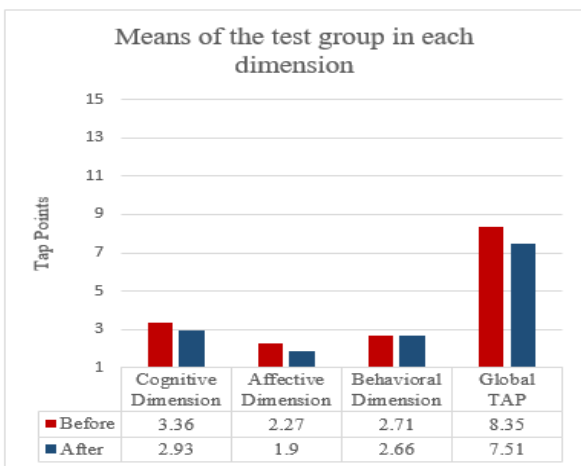

Figure 3. The means of the test group in each dimension

Correlating with the paired sample t-test, figure 3 shows the average of what the test group scored before and after the use of the application. The diagram scale goes from 1 to 15, since the point range in each dimension goes from 1 to 5, and in the global TAP from 3 to 15. The figure also shows the means from each dimension before and after using the application. This shows that the Cognitive dimension is the most affected one, having a difference of 0.43, followed by the Affective dimension, which was already low before the post-test, however it got a difference of 0.37 after the use of the application. In addition, the Behavioral dimension had a difference of 0.05 in its mean. Lastly the difference in the Global TAP is 0.84, since the Global TAP score was 8.35 before the use of the application, and 7.51 after.
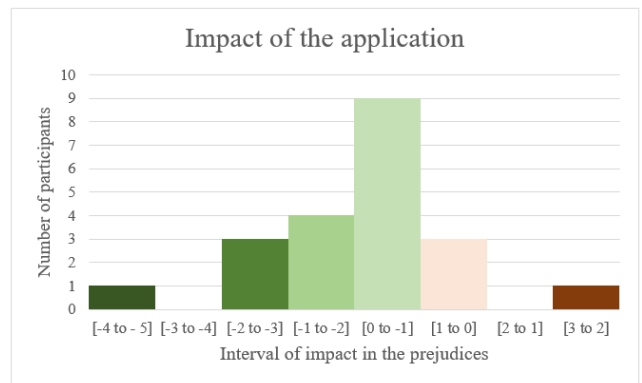

Figure 4. The difference in participants' Global TAP score after the use of the application.

Figure 4 uses green color saturation to show positive impact, and red to show negative impact. It is divided into intervals, which show how many persons in the test group are in each interval. Each interval shows the difference of the Global TAP score that the participants got after the use of the application. Therefore, it shows that most of the participant scored up to one point of positive impact in the Global TAP scale after using the application, while one person obtained an extremely positive impact of reducing their prejudices with 4.32 points. At the same time, one participant was very negatively impacted, by increasing it with 2.02 points.

In addition, there are other participants who were getting high scores (high prejudice) in the TAP before the use of the application, and afterwards, their score decreased which means that their prejudices reduced. For example, participant 4 with a Global TAP score of 9.4, which shows high prejudices, scored 6.6 after the use of the application which belongs to the interval -2 to -3 from figure 3. It is important to mention that participants who were negatively impacted were persons who already scored high scores in the TAP before the use of the application. After the use of the application their prejudices increased. However, in most participants a significant difference was not shown according to the paired sample t-test which showed p=0.3. Nonetheless, there was one of them who became significantly more negative than before, with more than two points.

5

Success rate of test group	
Global TAP	81%
Cognitive Dimension	67%
Affective Dimension	62%
Behavioral Dimension	10%

Table 1. Success rate of test group

In addition to this, table 1 shows the success rate of the test group, the success rate indicates the percentage of participants whose prejudices decreased after the use of the application, in the Global TAP and in each dimension.

Qualitative Findings

Correlating with Contact Theory, the findings showed that participants who expressed to have had positive contact with refugees, also tended to show positive views towards them according to Figure 2. In addition to this, they also expressed that they received more information (New Knowledge) about refugees by using the application. Nevertheless, there were also participants who expressed negative views towards refugees (Negative Position Towards Refugees). All these participants had negative experiences with refugees beforehand (Negative Prior Knowledge), and some of them mentioned that they did not really have any experience with refugees, but they were receiving negative information from the media. This is related to indirect contact, since they are receiving information about Syrian refugees through the media and not through personal experiences [6].

Participants who have had positive contact with refugees tended to show different types of empathy towards refugees. While, participants who have had negative contact, were more likely to only show cognitive empathy towards them.

New Knowledge

Based on previous work [4], research showed that having prejudices was often due to lack of information about refugees, and by providing new information to participants, their prejudices could be reduced. This is related to our findings since people were gaining more understanding of refugees and were reflecting when they received new knowledge:

"[I had] no idea how rough their journeys were" (P10)

"*I think I have never ever thought that they were happy to live in Syria"* (P13).

In addition to this, two participants said that, due to the application, they were able to know stories they otherwise would not be able to, if it was not for the application, as they express that it is hard for refugees to share their stories:

"*I know they have a hard time talking about it sometimes because it's just so hard for them"* (P16)

"[...] *I believe that I feel more connected because I listened to personal stories of people I probably would not have, had I just not … it is not often that you just walk to a person and say hey, would you tell me your story? So, people are more closed off and I do not think I would have the opportunity if it was not for the app."* (P10).

Prior knowledge

Another category was related to participants' information about refugees (Prior Knowledge About Refugees). Thirteen participants mentioned that they had good past experiences and therefore, they already knew about the refugees' situation:

"I was not shocked because I knew it was bad" (P14)

"*I have volunteered in Save the Children* [organisation]*"* (P13).

It seemed like the positive information that participants had about refugees before the interview, was a factor that resulted in participants having an even more positive view towards refugees after the use of the application, for example*: "Even if you know a little, it is not the same. After all, it is different from person to person. There are many different stories"* (P16).

Their prior knowledge was not always positive, since there were three participants who had bad experiences with refugees:

"[...] *by my own experiences at work, I have had bad experiences. There are way too many bad ones […] also because of my mother´s work, it quite affects me, because my mom works very closely with refugees, and she tells me stories which are not good and statistics also aren't good in general, at least from my past job, there were high percentages of refugees doing bad stuff "*(P20).

In connection to this, two participants also mentioned that their negative prior knowledge about refugees was not only based on bad experiences but also on the media:

"I think most people [refugees] *do not want to work, they are lazy because that is what I could see. That is also what I have heard in the news and media"* (P20)

"Yes, it is something one sees often, it is in the media that now this outbreak happens and now this and that happened. That is also why they fight over there, because of religion. I have nothing against them, it is just their culture that comes in the way" (P7).

Relationships

In this category, eight participants had meaningful relationships with refugees, such as family members or friends. While nine did not have any relationship, and one preferred not to.

Participants who showed to have meaningful relationships with refugees, they had positive views towards refugees*:*

"Partly because I grew up with it since I was small, when my mom taught them, and we participated in different parties with different nationalities. So, my views are positive towards other people." (P14)

"I have some friends who are refugees, or who have a parent who is a refugee. And I, myself, am a child of a refugee" (P12).

Six participants mentioned that they did not have any relationship with refugees even though they had positive views towards them (Positive Position):

"I don't have a close relation to many refugees […] I am not close friends with any of them" (P10)

"I don't know any refugees from Syria, but it made an effect on me while hearing, those stories" (P2).

However, one participant expressed that they preferred not to have any relationship with refugees:

"When you asked whether I would have a relationship with a refugee, I do not think, I want to have a relationship with any refugee… I would rather not" (P7).

Position towards refugees

Participants were asked about their opinions about refugees. Eleven participants showed positive views towards them.

"I am very neutral, because I think they come from a difficult place" (P16)

"I think they are […] cool and strong! Very brave people" (P21).

Their position towards refugees can be related to their positive prior knowledge, since two participants expressed:

"They make a great effort to try to become part of a society" (P11)

"It is not like they have fled because they wanted to. They have fled to build a better future. They have been happy to live there [Syria]*"* (P13).

In addition to this, participant 13 had meaningful relationships with refugees, which is associated to having a positive attitude towards them.

While three participants had negative views towards refugees, the same participants had negative past experiences and information about refugees:

"They are very bad-mannered and they do what suits them" and *"they say* [refugees] *that they give birth to a lot of children and we only give birth to two children, so they will probably take over soon and I don't like that"* (P1).

Empathy

All interviewed participants presented empathy at different levels. Regarding empathy, we found three types that were presented in the data: *Cognitive Empathy, Emotional Empathy, and Sympathy.* Eight participants showed sympathy after the use of the application, by expressing the desire to get closer to refugees:

"We should make room for them. They are welcome" (P11)

"[It makes me] want to have relationships with people from Syria" (P15).

Sixteen participants showed emotional empathy, since they expressed that they could feel for the refugees:

" It hits hard, because they come here alone […]" (P13)

"[…] to say goodbye to one's family and not see them again is terrible" (P15).

Sixteen participants showed cognitive empathy, since they mentioned that they could put themselves in the context of the story and could imagine how it would be to be in their place:

"I could easily imagine what kind of reality they come from" (P17).

In connection to this, three participants presented negative thoughts about refugees. All these participants were also presenting cognitive empathy, as they could relate to most refugees' situation without evoking emotional responses.

"I did not really feel anything, but I could imagine myself in their place" (P20).

Equality

Participants who had adopted a positive position towards refugees, were providing statements related to this category. Regarding *Equality*, eight participants mentioned that refugees should be treated equally:

"We are all human, despite religion" (P4)

"[I] see them just like us, as people. They flee due to war, and they are not fleeing because they want to take advantage of our system" (P12).

Equality can be connected to prior knowledge, as one participant expressed:

"The refugees that I had in my class have been fine. Just like the other children who were born in Denmark" (P14). Another interesting aspect to consider, is that two participants who presented negative thoughts about refugees, were also providing statements about equality:

"They have the same traditions as us" (P1)

"I like that they are just like everyone else, that they are good at integrating too and that they study or work and have dreams like everyone else" (P20).

It can be argued that this is due to the information they recently acquired, since when they were expressing these thoughts, they were talking about the stories in the application.

Reflection towards their own Society

Most participants who were expressing their positive thoughts about refugees, were already aware of the existence of negative attitudes that part of society has about them. Thirteen participants reflected about their own society:

"I'm also ashamed of Danes in general" (P15)

"There are many prejudices around those who are Muslim and wear a scarf" (P17).

Two participants expressed that media might have a role in the way society perceives refugees:

"The media also has a lot to say, they do influence people's view" (P13)

"In the media, we only hear about the bad stories and not the good ones" (P11).

In connection to this, two participants declared that society should be better at understanding the circumstances refugees face:

"I just think many do not understand or put themselves into what "war" actually means" (P9)

"A lot of people judge them for coming here, even though they do not want to come here" (P10).

Eight participants expressed their concerns about the way society handles refugees:

"Can't people behave properly and respect them? Why are they not allowed to be here? I do not get the idea of messing with them" (P19)

"[...] treat them better in Denmark and talk nicer about them" (P5).

In addition to this, three participants suggested giving the application to prejudiced people, as they believed that their prejudices could be decreased through the use of it.

DISCUSSION

Both quantitative and qualitative analysis showed that Walking in my Shoes made an effect on the participants' prejudices. However, the effect it had on them was related to their previous experiences with refugees and/ or the media.

In this section, we are going to dive into what we have learned from this process, as well as the relevance and interpretation of our findings and how they relate to our literature.

Implications for Design

We identified four elements from the application that made an impact on participants' prejudices and were related to one or both theories. We consider these elements important for future designers since they might serve as proposals for the creation of a technology that encompasses empathy, creates contact and reduces prejudices.

Stories

In order to provide knowledge about Syrian refugees and their culture to participants, real-life stories about Syrian refugees were provided based on Nili Steinfeld´s study which highlights the importance of storytelling to change people's attitudes [23]. By presenting the stories this way, we succeeded in creating empathy, as the participants showed signs of feeling (cognitive and emotional) empathy and sympathy after listening to the stories. This can provide valuable insights for future designers on the role of storytelling to create empathy and on the effect of stories on participants' perceptions of refugees.

However, our technology only contained two stories and was used for a limited amount of time. Some participants only used the technology for a day, which might not be enough time to have long-term effect on people's prejudices. Therefore, for future research, it is suggested to provide more stories in the technology and to prolong the study.

In this research, we made sure that the stories were well-formulated and understandable for any reader. This was successful in terms of participants being able to understand the stories easily. Therefore, we suggest that future researchers put emphasis in creating engaging and understable stories.

In addition to this, Mckeown [16] highlighted the importance of a good story to effectively decrease prejudices. Therefore, it is also important to consider the quality of a story and how to create a good story. We recommend for the future, to research in- depth about what constitutes a good story. Moreover, our stories include background music, which is also important to consider when using it in a technology. As music could be interpreted in different ways by different people, we recommend future designers to consider the music choice and the situations that it could be added to, as well as researching about the effects of music in people's perception.

Self- Reflective Questions

The aim of using self-reflective questions at the end of certain parts of both stories, seemed to be effective, since some participants reflected over how it would be to be in the refugee's shoes. This was successful in creating empathy [15].

This correlates to the theory Affective Process Regarding Empathy and Perspective [18], since the stimulation of empathy by the use of self-reflective questions caused some participants to be less prejudiced.

Therefore, it is considered to be a good component for future use, when designing a technology that utilizes reflection to create empathy. However, it is important to carefully consider how these questions are created, as some participants might interpret them incorrectly. For example, in the pilot test, some participants expressed feeling confused an accused about these questions, which we then reformulated. Furthermore, empathy is stimulated through storytelling when complementing it with pictures and self-reflective questions [15]. This was done in order to make participants put themselves in the refugee's shoes.

Features

Three features were incorporated in our prototype: Links, pictures, and markers.

Based on past studies from our related work [4], we incorporated information about the interviewed Syrian refugees in the form of links which provided an insight about their culture and music and the aftermath of war in Syria. In addition to this, markers were also added in the map, which included the places the refugees who told their stories liked to visit in Denmark. Lastly, the pictures related to the stories were incorporated.

In our case, some participants showed to have an impact by the use of markers as it made them reflect over the cultural similarities between them.

In addition to this, the pictures used in the application were intended to make an impact in the participant in order to achieve empathy, reflection and understanding of the story. According to the findings from the interviews, these features were factors that helped make an effect on people's prejudices by the acquirement of new knowledge. Therefore, we recommend future designers to incorporate features that offer information about the minority group if the intention is to reduce prejudices.

However, some participants did not use these features, therefore it was challenging to know to what extend it had a significant effect on our participants. For that reason, we recommend to further research into the effects that these features might have on participants.

Activity

A research by Harris et al. [10] stated that people tend to concentrate more while walking. Therefore, we deemed important to design a technology that not only focuses on providing stories like podcasts, since people with high prejudices against refugees are not usually interested in learning about them [7]. Therefore, we added walking as an activity, so that the technology can be more attractive to all kinds of participants.

What was interesting about our findings, is that some participants mentioned that they could reflect and imagine how it would be to be in the refugee's shoes, as well as the differences between their lives in Denmark and Syria.

Participants mentioned enjoying this activity, however, some participants used it in alternative ways inside and outside their home, for example when knitting or running. Our findings showed that the technology had a positive effect on participants when doing these activities.

For that reason, having an activity that does not require complete attention on it, such as walking, appeared to be beneficial in the technology, and can be recommended to future designers not only as a way to concentrate but also as a way to create reflection in participants.

IMPLICATION FOR RESEARCH

According to our results, four main elements from our research were identified and are considered relevant for future research.

Theories

Contact theory and Affective Process Regarding Empathy and Perspective were chosen as theories, since both theories are broad and therefore they gave us the possibility to design as desired, considering that direct and indirect contact can be achieved in many different ways [6], as well as empathy can be stimulated in diverse forms [5, 20].

However, participants used the technology for a short amount of time, some of them even for only a day, making it difficult to know the long- term effect that empathy might have on participants. For this reason, we propose to research more about the theory of empathy, its effects and limitations if the theory is to be chosen to create a technology.

Even though the application succeeded in reducing prejudices in most participants, there were also a few participants whose prejudices got higher after the use of the application, though the negative impact was not significant. This could be explained by an article made by the Psychological association for science, where it is stated that the changes of attitudes towards another group of people require high motivation, otherwise there is the risk of triggering high levels of attitude resistance, since the individual can feel that their self-determination is threatened [1].

However, Murrar and Brauer suggest that narratives are the only way for overcoming this resistance, since they provide social models and transport individuals to other realities [19].

Moreover, participants who had negative attitudes towards refugees from Syria, had negative prior knowledge and ideas about refugees as a consequence of the negative exposure to the media and bad experiences and memories before testing the application.

Our recommendation is to add more, and different stories with different experiences in order to provide the participants with more information about refugees.

Based on related work [8], we suggest future designers to contemplate creating a technology that does not only takes into account people's past experiences, but also the information they receive from the media, to reduce prejudices. For example, a solution might be to create a technology that can help people reflect over their own prejudices and the power of media in changing their mindsets. However, our findings show that there are many

different reasons why people have prejudices that still need to be researched in order to find the best solution.

Gathering stories

We recommend future designers who wish to work with vulnerable groups who have been through traumatic situations, to take into consideration the difficulties that might arise when discussing sensitive topics. In our case, we needed very sensitive and intimate information for the stories to make an impact. Therefore, we let the interviewed refugees decide the location where the interviews were going to take place, and we provided the interviewees a declaration of consent, in which we compromised to protect their identity by different means. Therefore, we recommend making the interviewees feel as comfortable as possible when interviewing about sensitive topics. Consequently, it has been difficult to find Syrian refugees who agreed upon being interviewed about such topics. We suggest future researchers to consider collaborating with Asylum centres, since that would facilitate the task of finding Syrian refugees. This could also provide the interviewees the possibility to open up more when telling their stories if their contact person or someone they trust is present apart from the researchers.

Participants

What was interesting from our findings, was that some participants with moderately high or low prejudices, felt engaged to help refugees after the use of the application. In connection to this, our technology can be used as a basis for reducing prejudices in a general and broad population.

However, based on past research [4], people with high prejudices tend to have discriminatory attitudes. Therefore, we suggest that it would be adequate to design a technology that also includes people with very high prejudices. In our study, less than half of our participants presented high prejudices, therefore, the effect of the technology on people with high prejudices could not be generalized.

However, gathering participants with high prejudices can be challenging as it might be difficult for prospect participants to accept and express their prejudices openly.

In this study, we have different ethnic backgrounds and the participants were gathered through our network. Therefore, it was challenging to find participants who were obvious in their negative views towards refugees, or that had no connections to refugees or foreigners. In future research, it is suggested that researchers consider the challenges that might arise when attempting to gather participants with high prejudices. One option might be to gather people from Facebook groups against refugees. Another option, though time consuming, could be to gather participants and measuring their prejudices by using the TAP questionnaire. By this, one can identify participants with high prejudices and possibly discard others if the intention is to see the effects of a technology in this specific group.

The use of the TAP tool

In our study, the use of the stories focused on the stimulation of empathy and indirect contact and were not intended to make participants reflect over their own relationships with

refugees. This has been manifested in the results of the TAP tool, since it contains the behavioral dimension, which is related to the preferred social distance as part of the measurement of prejudices. This dimension has not been significantly affected after the use of the application, since the theories that were used to make this prototype were not referring to social distance.

Nonetheless, the use of the TAP has provided good and insightful results on measuring prejudices. Furthermore, the theories we used to create this prototype, were correlating with the cognitive and affective dimensions. Therefore, those dimensions showed a significant effect. In case future researchers choose to use the TAP, we suggest to consider the theories that the tool is based on, so that the dimensions correlate with the technology. Otherwise, if another tool to measure prejudices is chosen, we suggest to research the theories this tool is based on, and consider them when designing a technology.

In addition to this, we did not conduct any interviews before the use of the application. Therefore, we do not know what the participants views and experiences on refugees were before the use of it. For example, some participants showed high prejudices in the TAP results before the use of the application, and then, after the use of it, they presented lower scores in the TAP. This correlated with the interviews, since they were showing positive views towards refugees. However, since the TAP did not provide information about the participants' experiences with refugees, we do not know what triggered some participants to have high prejudices before the use of the application. This information could have helped us get a better understanding of the theories and of our technology. Therefore, for future research, it is suggested to conduct semi-structured interviews before the use of the application.

CONCLUSION

In this paper, our aim was to answer the following problem statement:

How can prejudices against Syrian refugees be reduced through the use of technology?

To answer this, we introduced the Walking in my Shoes prototype, which contains real-life stories from Syrian refugees, self- reflective questions, information about them, and features that facilitate walking.

The prototype was evaluated by using quantitative and qualitative approaches. By using the Paired Sample t-test, we were able to compare the quantitative results from the pre- and post-test and could conclude that there was a significant change in the scores which reflected the participants' prejudices. According to our results, 81% of participants reduced their prejudices.

In addition to this, the qualitative findings complemented the qualitative and were correlated with the theories we used.

Hereby, we conclude that the use of narrative containing information about Syrian refugees could reduce prejudices through the stimulation of empathy.

Our study presented some limitations worth mentioning.

Even though all participants expressed that they enjoyed using the application, it is not certain that participants with high prejudices would use it by their own means.

In addition to this, the group of participants who tested the prototype was not big enough to generalize the result.

Furthermore, the technology only contains two stories with a short duration of time, therefore, the information they received was limited as well as the amount of time they used it.

Walking in my Shoes was working differently in different phone models, and the application was only working on 'newer' phone models (over API level 24 - Nougat 7.0). In addition to this, the technology was only developed for Android users, IOS users were not included.

As future work, our intention is to research and add further features that could engage a change on the behavior in terms of social distancing. As well as making the application available to other platforms.

Additionally, we suggest increasing the number of stories and participants.

We believe that this research and design can be beneficial not only to reduce prejudices against Syrian refugees, but could also be used in order to reduce prejudices against other minorities and stigmatized groups.

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