

The Influence of a Perspective in a Video on Attitudes Towards People with Dementia

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ABSTRACT

More and more people suffer from dementia worldwide, which is an emerging problem in society. The stigma on dementia has a negative effect on people with dementia and their family. A way to reduce the stigma is by addressing stereotypes, by getting people in contact with people with dementia and by letting them empathize with people with dementia. It is not clear yet which perspective works best.

Participants were randomly assigned a perspective or baseline video. After watching the video the participants filled in the Dementia Attitude scale which is divided in the factors comfort and knowledge.

For the DAS and the factor knowledge, the score is highest for the third perspective, followed by the first. The second perspective had no or a negative significant difference from the baseline. For the factor comfort it can be concluded that video about dementia resulted in a higher score than the baseline video.

Author Keywords

Stigma; Dementia; Perspectives; Attitude towards dementia; Video.

INTRODUCTION

Alzheimer's Disease International states that 50 million people live with dementia worldwide in 2020 [2]. This number is expected to increase to 82 million in 2030. However, even though this is an emerging problem people are still not aware of what dementia is. According to Alzheimer's Disease International's World Alzheimer Report 2019, 2 out of 3 people think that dementia is caused by normal aging and 95% of the investigated people think that they could develop dementia [1]. In the same report it is stated that people with dementia feel treated unfair and would hide their diagnosis from others. This behavior is caused by the stigma on dementia [1, 20, 21, 28]. Therefore, it is of importance that this stigma is reduced.

There are already a lot of initiatives to reduce the stigma on dementia, a lot of countries have a national dementia strategy for example. However, these strategies are not the only solution. Design intervention solutions that are available for the public can help in improving the attitudes towards people with dementia [5, 7, 11, 13, 26]. Other stigmas are reduced with help of videos and it is investigated what perspective works best to reduce the stigma [4,22]. Research has also shown that there are differences in experiencing between the

first and third perspective [6, 10, 12]. However, it is not investigated yet if the perspective from which a person sees a video of someone with dementia has an influence on their attitude towards people with dementia. Therefore, the research question of this study is: *Will the perspective (first, second or third) from which a story is told in a video have an influence on a change in the public opinion on dementia?*

THEORETICAL BACKGROUND

Stigma

Stigma is present in various parts of society and can be described as negative emotional and/ or behavioural responses to people who have traits that are seen as different from normal [1]. The stigma on dementia can be divided into three types, the first type of stigma is the public stigma which is caused by the attitudes and beliefs of the general public towards the person with dementia or their relatives. The second type is the personal stigma or self-stigma which means that the person with dementia has internalized the public stigma and suffers from the negative consequences of doing so. Courtesy stigma is the last type of stigma and is described as the emotions and behaviours towards people close to the person with dementia [16, 21]. The stigma on dementia is a large problem, it causes a delay in recognition and diagnosis of dementia because people try to hide the symptoms out of shame caused by the self-stigma [20, 21, 28]. Besides that, the public stigma worsens the suffering of dementia for the person with dementia because they have to cope with negative responses to the diagnosis [20, 21]. The quality of life and psychosocial well-being of people with dementia decreases because of this [16]. According to Alzheimer's Disease International, the stigma is caused by stereotypes and can be reduced with multiple techniques among which education, addressing stereotypes, public awareness through people with dementia and social contact with a person with dementia [1, 21].

Perspectives

As mentioned above, Alzheimer's Disease International states that the stigma can be reduced by awareness through people with dementia [1]. This is related to the first person perspective, people experience first-hand how a person with dementia feels [6, 10]. Social contact with a person with dementia is another technique to reduce the stigma [1], this is an experience from the second person perspective [8]. Addressing stereotypes is the third technique mentioned, which can be achieved by the third person perspective since

this is done from an outsiders perspective instead of from one of the persons in the situation [6, 10]. All three would have a contribution to reducing the stigma, however it is not clear what perspective is the best practice in order to generate a more positive attitude towards people with dementia.

Several studies investigated the effects of different perspectives. The study of Ge et al. [12] investigated the difference in neural activation regarding action observation and understanding when watching the way a cup is held in the first or third perspective. This study indicated that the first person perspective had a more extensive and stronger reaction than the third person perspective. Another study that compared first and third person perspective used a virtual reality scenario [10]. In this scenario the avatar experienced pain, pleasure or had a neutral experience. The participants mentioned that they experienced strong ownership in the first person perspective but not for the third person perspective. Besides that, the study used physiological responses of which the skin conductance responses indicated that the first person perspective resulted in higher reactivity. The study of Canizales [6] had similar outcomes. Their study showed participants visuals from first and third person perspective and watched the results with an EEG. The results showed that participants found the same scenario more painful from the first person perspective than from the third person perspective. All three studies indicate that the first person perspective has more psychological effects than third person perspective. The first study focused on neurological reactions while the other two studies focused on physiological responses. Only one study used the participants' subjective opinion [10]. These studies indicate that the first person perspective results in more psychological effects than the third person perspective. However, these studies did not take the second person perspective into account and are focused on pain, pleasure and neutral feelings, which disregards a lot of other feelings.

RELATED WORK

Looking through the eyes of someone with dementia

As mentioned earlier, the stigma on dementia can be reduced by creating awareness through people with dementia and by educating people about dementia. A company that combined these two techniques is *Into D'mentia* [18]. This company provides a virtual reality experience where the participants can experience a day in the life of someone with dementia. The participants view the world through their eyes and hear their thoughts. The purpose of this company is to create compassion and provide training for healthcare professionals. Another example of implementing virtual reality to better understand the life of a person with dementia is *A walk through dementia* from Alzheimer's Research UK [1]. This project is focussed on increasing the understanding of what dementia is via three scenarios in a virtual reality App. Both examples increase the ability to empathize with people with dementia and understand why they respond the way they do and how to react to that. However, they both

focus on educating and did not test if this helps to reduce the stigma.

Reducing stigma

As mentioned before, a way to reduce the stigma is via contact with people with dementia and via awareness through people with dementia. This also applies to stigma on other mental illnesses such as depression [22]. The study of Na and Chasteen [22] investigates if perspective taking (first perspective) or imagined contact (second perspective) worked best in order to reduce the stigma against depression. The study compared two other studies that both showed that imagined contact worked better than perspective taking. A study that also focuses on reducing stigma of mental problems is that of Amsalem et al. [4]. In this study the stigma on schizophrenia is investigated. The participants viewed a social contact-based video, a written vignette or a non-intervention control condition. The study shows that participants that viewed the video had the best reduction of stigma. These studies are not focused on reducing the stigma on dementia but show solutions for other stigmas.

Perceptions on dementia measurement instruments

There are a number of studies that focus on improving the attitudes that people have towards people with dementia with an intervention. These studies use validated scales to assess the influence of their intervention. Farina et al. [9] investigate the attitude that adolescents have towards people with dementia. In their study they use three perceptions on dementia scales for adolescents. The first scale that they use is an adaptation of the level of contact questionnaire for mental illness [17]. This scale is used to better understand the outcomes of the other scales of the study of Farina et al. [9], the scale is validated and tested for reliability [24]. The second scale is the Allophilia scale [25]. This scale is used to investigate the attitudes towards outgroups and is altered for dementia specifically in the study of Farina et al. [9]. The scale is validated by the developers itself and by Kinney et al. [19], the latter validated the scale specifically for the out-group of people with dementia. However, this scale is not widely used in other studies focused on dementia. The last scale in the study of Farine et al. [9] is the adolescent attitudes towards dementia scale (A-ADS) [10]. The A-ADS scale is based on the Dementia Attitudes Scale (DAS) [23] combined with two dementia scales created for children [15]. The DAS scale is validated and tested on reliability by its developers and by others [15, 23, 27]. The DAS scale is a 7-point Likert scale and has 20 items divided in the factors comfort and knowledge. The DAS can be scored between 20 and 140 and has 6 reverse scored items.

Multiple studies use this scale as a before and after measurement for interventions that are aimed at improving the attitude towards people with dementia. An example is a study that investigates the impact that working with people with dementia in a museum has on medical students' perception on dementia [26]. The DAS scale is used two weeks prior to the intervention as well as directly after the intervention and shows an improvement in attitudes towards

people with dementia. The mean score before the intervention was 97.4 while the mean score after was 105.8. Another study that focused on medical students' attitude towards people with dementia let students participate in a poetry workshop with people with dementia and let them fill in the DAS a week before and a week after the intervention [11]. Before the intervention the participants scored 107.09 as a mean while they scored 121.82 mean afterwards. George, Stuckey and Whitehead [13] used the DAS scale in a mixed method approach to investigate the change in attitude of medical students during a storytelling workshop. Similar to the other studies, these authors used the DAS scale before and after the intervention. The study of Cowan [7] used the dementia attitude scale in a similar method but with a different target group. In this study the participants were college students and community members who joined a dementia friends information session. In this study, the DAS was filled in directly before (mean 110.7) and directly after (mean 121.9) the intervention and a significant difference was measured. The study of Banerjee, et al. [5] used multiple scales to investigate the effectiveness of their intervention on medical students over two years with one baseline and two follow-up moments. In their study they made a distinction between the DAS score and both DAS factors; comfort and knowledge.

All these studies show that the DAS scale can be used as a before and after comparison in order to investigate the effectiveness of an intervention and show differences on factor and item level. The scale has not been used to investigate a difference between two or more interventions in order to find the most effective one. However, it gives a clear rating, is focussed on assessing people's attitude towards people with dementia and is used for comparisons in previous studies.

METHOD

The goal of this study is to find out if the perspective from which a story is told has an effect on the way people look at a person with dementia. The study will consist of an experimental quantitative research setup. Each participant will watch a video from one of the perspectives or the baseline and answer Likert scale questions that are focused on their view on people with dementia.

Participants

The participants of this study will be adults between 18 and 65 years old. There are no demographic filters applied so that the outcomes can be generalizable. There could be a bias because of this since the stigma differs in every country [1]. In order to gather insights in this, the participants are asked to fill in the country that they live in the demographic questions section, see Table 1. The participants are recruited via Prolific and will be paid 9,70 euros per hour. A pilot study was performed to determine the duration of the survey and to find out if all the questions are answered in the right way. The pilot showed that the survey would last about 8 minutes on average. Therefore the participants get paid 1,29 euros which is 1,11 dollars. Participants will get rejected if

they do not spend at least 2 minutes plus the time of the assigned video on the survey or if they cannot answer the question after the video that will show whether they have watched the complete video. Each perspective will need approximately 20 to 25 participants, so in total 80 to 100 participants will be recruited. The participant sample will be chosen pragmatically. The reason that this random sampling is chosen instead of four groups with equal demographic representations (stratified sampling) is because the loss of participants that this could cause does not weigh against the possible bias of pragmatic sampling. Random sampling is also representative for the real world and can therefore be applied.

Video	1	2	3	4		1	2	3	4
Age					Education				
18-25	14	11	10	14	High school	9	7	9	9
26-35	5	5	8	5	Bachelor	8	6	4	6
36-45	2	2		1	Master	5	6	6	5
46-55	1	2	1		Do not know		1		
Gender					English				
Man	11	13	9	10	No	18	14	13	13
Woman	10	7	10	10	Yes	4	6	6	7
Non-binary	1								
Country					Mexico	1			1
Canada		1	1		Netherlands				1
Chile		1	2	1	New Zealand		1		
England	2	3	4	4	Poland	2	5	1	1
Estonia			1		Portugal	6	4	5	5
France			1	1	Scotland			1	
Greece	1	1	1	2	Slovenia	1	1		
Israel	1				South Africa		1		1
Italy	4	2	1	3	Spain	2			
Latvia	1				United States	1		1	

Table 1: Participant population over 4 groups

STUDY SETUP

The study will be held online, this is partly due to the current COVID-19 restrictions but also a suitable method to reach a lot of participants fast. Each participant will have to fill in a consent form before they can participate in the study. After this is done, the participants fill in demographic questions regarding age, gender, level of education, country of residence and if English is their proficient written and spoken language. Then they will answer Level of Contact Likert scale questions and watch the randomly assigned video of the first, second or third perspective or the baseline video. After the participants have watched the assigned video, they answer an attention check question followed by the Dementia Attitude Likert scale questions about their

experience. First 12 responses were collected via the pilot study, this study had shown that the exclusion criteria worked well and the questions were asked in the right manner. However, the study took on average 3 minutes longer than anticipated. Therefore, the participants of the pilot study were compensated for the extra time.

Instruments

The scales that are used are inspired by the study of Farina et al. [9]. The Level of Contact with people with dementia Likert scale is based on the level of contact with people with mental illness scale [17] as Farina et al. [9] applied it. Even though Farina et al. [9] altered the scale specifically for adolescents, the content of the scale is appropriate for this study since it is mostly altered for contact with people with dementia. After the participants have watched the assigned video, they will fill in the Dementia Attitude Scale (DAS) [23]. This differs from the study of Farina et al.[9] since they use the A-ADS scale which is specifically for adolescents. Another difference from the study of Farina et al.[9] is that the adapted version of the Allophilia scale was not applied. The reason for this was that the questionnaires are used to enable comparison between the four groups. An additional scale would be beneficial when the behaviour of the participants was investigated instead of the difference that the video has caused. The surveys were created in Microsoft Forms since this platform is protected by password which ensures that the data of the participants is saved and only accessible by the researcher.

Analysis

Before the analysis can be performed, the scores have to be calculated. The Dementia Attitude scale has 6 reverse scored items that have to be translated. The DAS and LOC scale are Likert scales of which the DAS score has 7 items ranging from strongly disagree (1) to strongly agree (7). The LOC scale has 5 items with a range from never (1) to a great deal (7). The scores of both scales can be calculated by adding up the answers. The next step is to calculate the factors of the DAS scale, which are comfort and knowledge. After that, the demographic answers have to be translated to numerical data for further processing.

After preparing the data, multiple statistical tests (with $\alpha=0.05$) are performed to determine the relation between the dependent variable (DAS score) and independent variable (assigned video). Besides that, the influence of the video’s on the two factors of the Dementia Attitude scale is investigated.

Intervention design

The participants will be assigned to one of the four videos. The **first perspective** video is a video from the perspective of a day in the life of someone with dementia in which the struggles that they face every day become clear. The **second perspective** video is filmed from the person who has a conversation with a person with dementia, the video shows what struggles they face when doing grocery shopping. The **third perspective** video shows the conversation between two people in which it becomes clear what struggles the two

people have in a morning routine. The fourth video is not focussed on a person with dementia and is used to gather a **baseline**. The baseline is used to determine the DAS score when no information about dementia is given so that the scores of the other perspectives can be compared to this score. The video is a manual on how to water plants correctly. It is acknowledged that it would be better to use the same scenario and show it from three different perspectives so that there would be no bias because of different scenarios. However, creating the videos without expertise in video making or animating could also cause a bias and therefore it was chosen to use existing material.

RESULTS

In order to find out what the relation is between the Dementia Attitude score and perspective from which a video is shown multiple statistical analyses are performed. The analysis started with a single regression which does not show a clear relation between the dependent (DAS score) and independent variable (video). As can be seen in Figure 1 and Table 2 the R-square is 5%, which shows that only 5% of the variance in the dependent variable is explained by the independent variable.

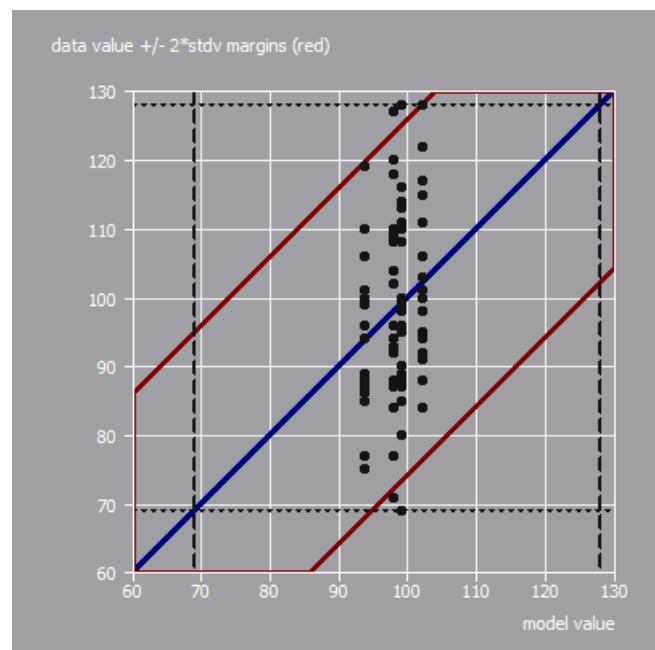


Figure 1: Graph of single regression Video vs DAS score

R	R2	Adjusted R2	Std. Error of the Estimate
0.223637	0.050014	0.013001	13.2341

Table 2: Single regression between Video and DAS score

The ANOVA analysis of the relation between the dependent variable DAS score and the independent variable Video did also not show a significant difference ($\alpha=0,05$) between the means of the groups (Figure 2). Therefore it is assumed that the other variables have an influence on the outcome. First it had to be investigated how much effect the independent

variables have on the DAS score. Therefore multi-model regression with the variables video, age, gender, education, country of residence, English as a profound language and Level of Contact score is performed. See Table 3 for the results of the analysis in which 1 to 7 are the independent variables. This analysis shows that the most weight goes to the model in which only the 7th variable, LOC score, is used. The table also shows that the effect of removing any of the variables, apart from the 7th, on R-squared is very little. This indicates that the other variables do not have a lot of influence on the outcome. Therefore, the LOC score can be seen as a confounding variable and its influence has to be filtered out of the data in order to be able to see differences between the four groups.

Pair	1	2	3	4	5	6	7	Weight	R2
1	x	x	x	x	x	x	x	0.00338703	0.22991
2		x	x	x	x	x	x	0.0105881	0.22748
3	x		x	x	x	x	x	0.0116305	0.22926
4	x	x		x	x	x	x	0.0110843	0.22835
5	x	x	x		x	x	x	0.00692381	0.21933
6	x	x	x	x		x	x	0.00382075	0.20779
7	x	x	x	x	x		x	0.00879427	0.22393
8	x	x	x	x	x	x		2,33193e-05	0.10150
9			x	x	x	x	x	0.03424	0.22635
10		x		x	x	x	x	0.0338465	0.22612
11		x	x		x	x	x	0.0209699	0.21692
...									
27	x	x	x	x			x	0.0126459	0.20708
28	x	x	x	x			x	8.77892e-06	0.05111
29	x	x	x	x	x			4.40504e-05	0.08816
30	x							0.000158815	0.01004
31		x						0.000140826	0.00710
32			x					0.000169353	0.01161
33				x				0.000419344	0.03349
34					x			0.000457773	0.03558
35						x		0.000105586	0.00001
36							x	0.613079	0.19266

Table 3: Multi model regression

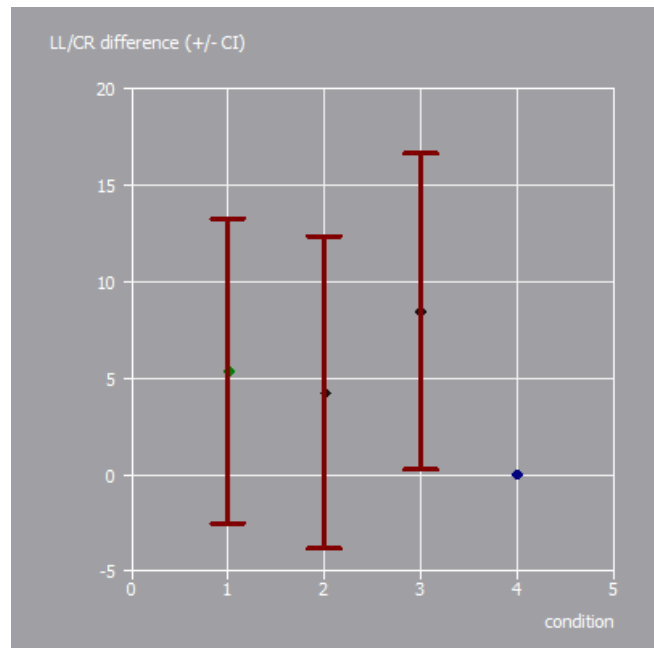


Figure 2: Dementia Attitude scale vs Video (condition). Condition 4 is the baseline.

First, covariant analysis was performed (Figure 3) with the assumption of constant slope, which means that the influence of the confounding variable would be distributed evenly over all the groups.

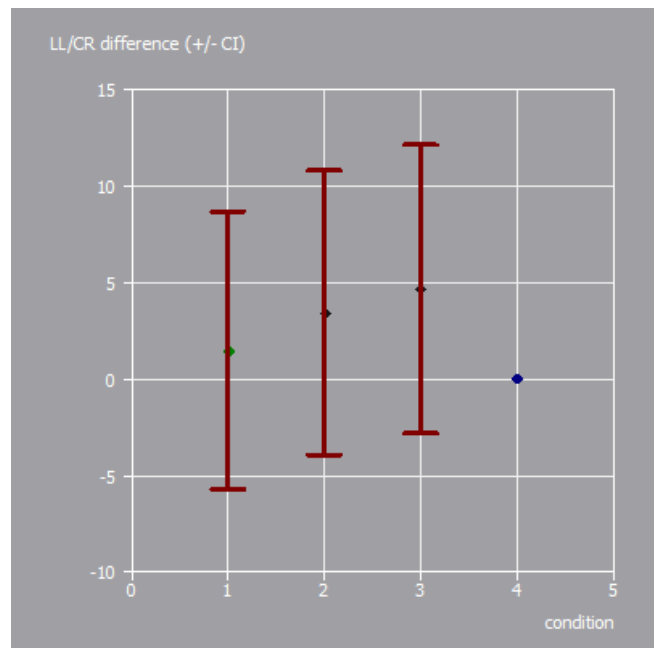


Figure 3: DAS score vs Video after covariant analysis.

This graph shows a minor difference, therefore the distribution of the influence of the LOC score should be investigated by looking at the gain vs the attribute of the LOC score, see Figure 4.

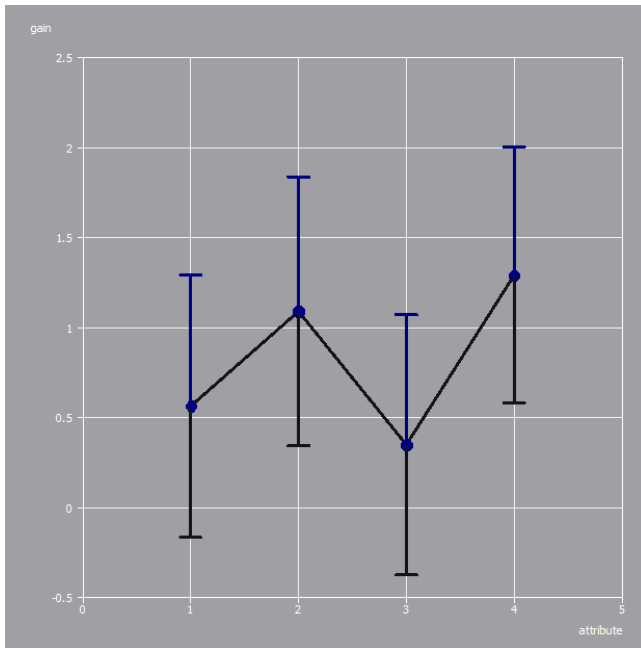


Figure 4: Gain vs attribute: distribution of the influence of the LOC score on the DAS score.

This graph shows that the influence is not evenly distributed among the four groups. Therefore the covariant analysis is not fair and multi-level analysis is needed (Figure 5).

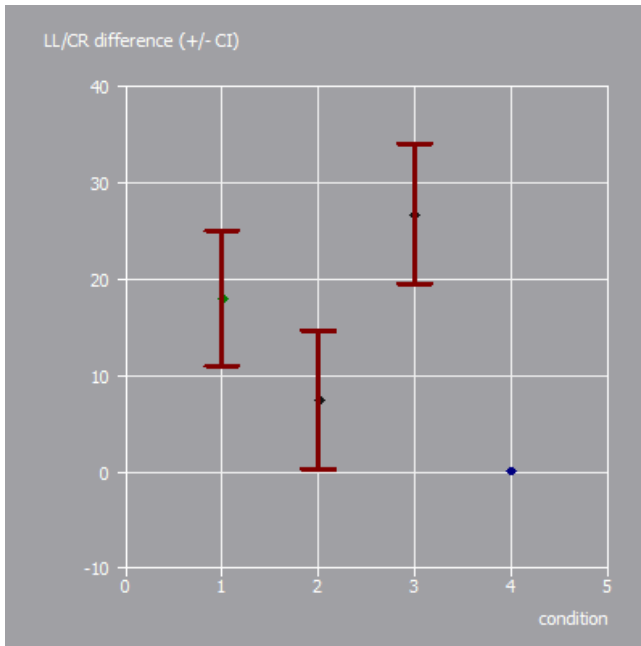


Figure 5: Difference between means for DAS score vs Video after filtering the influence of the LOC score with multi-level modeling.

Figure 5 shows the distribution in a better way. In order to find out if there is a significant difference in the mean between these groups, the ANOVA analysis is needed. This analysis shows $F(3,77)=19,497$ ($p=1.67971e-09$) which is $\alpha < 0.05$ and therefore, that there is a significant difference between the groups. However, this analysis does not show

how much and between which groups this is. Therefore a Post-Hoc analysis is performed, see table 4. Table 4 shows that there is a significant difference between all groups except for group 2 and 4. As can be seen in Figure 5, group 3 has on average the most positive difference to the baseline, followed by group 1. Group 2 and 4 have the lowest score. However, the difference between 2 and 4 is not significant so it cannot be said that the baseline video had the least effect on the DAS score and that therefore the video's improved the attitudes towards dementia.

	Confidence interval	P	Significant
1-2	3.35119,17.8343	0.00469785	Yes
1-3	-16.1028,-1.42136	0.0199827	Yes
1-4	10.6717,25.1549	4.72192e-06	Yes
2-3	-26.8637,-11.846	2.09803e-06	Yes
2-4	-0.0914377,14.7325	0.0528917	No
3-4	19.1665,34.1843	6.07579e-10	Yes

Table 4: Post-Hoc test DAS score vs Video

Simple regression of the filtered data shows that the R-squared is 43,17%, which is quite low (Table 5). However, compared to the previous analysis, there are significant differences. A reason for the low value could be that the data gathered is of human behaviour, which is harder to predict by a model. As can be seen from Figure 1 and Figure 6, filtering the effect from the LOC score out of the data improved the model in a way that the variance in the DAS score can now be explained by the different Video's in 43% of the cases compared to 5%.

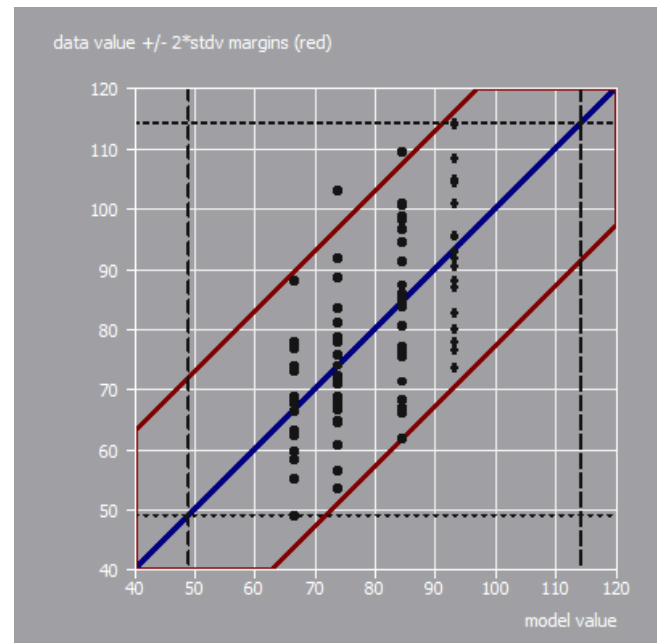


Figure 6: Single regression DAS score vs Video after filtering.

R	R2	Adjusted R2	Std. Error of the Estimate
0.657040	0.431701	0.409560	11.7744

Table 5: Single regression between Video and DAS score after filtering out the effect of the LOC score.

Figure 7 shows the averages for every group, this is a similar picture compared to Figure 5. However, this graph also shows how high the scores are in the range from minimum 20 to maximum 140 as a DAS score.

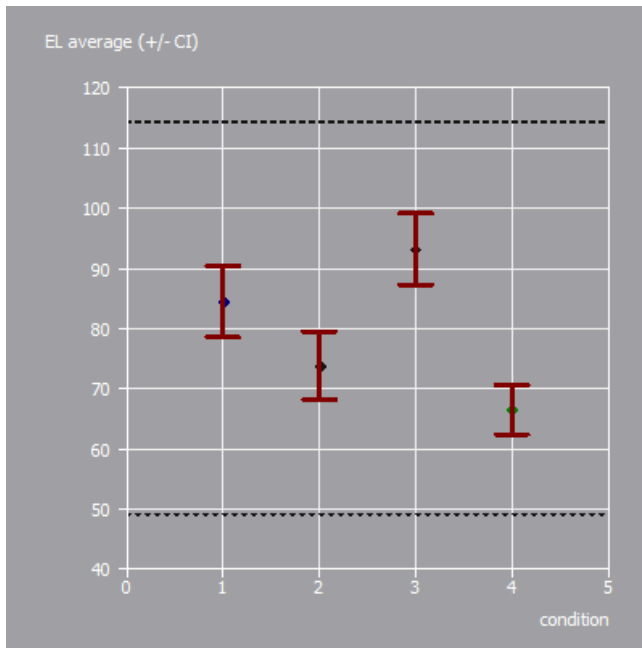


Figure 7: Averages for every video after filtering the influence of LOC score from the DAS score

In order to determine if the sample size fits the study, the power (beta) is calculated via the Post-Hoc analysis. The minimal required value for beta=0,8. Table 8 shows the results of the analysis and the amount of measurements required to reach the beta.

DAS		Factor1		Factor2	
1-2	0.748488 (1.51*)	1-2	0.414091 (3.35*)	1-2	1
1-3	0.560872 (2.31*)	1-3	0.389843 (3.359*)	1-3	0.545758 (2.39*)
1-4	0.998945	1-4	0.99904	1-4	0.915889
2-3	0.998311	2-3	0.0283786 (746.98*)	2-3	1
2-4	0.567667 (2.27*)	2-4	0.999999	2-4	0.99467
3-4	1	3-4	1	3-4	0.99985

*need x times more trials for beta=0.8

Table 8: Power for each group

Factors of the Dementia Attitude scale

As mentioned before, the dementia attitude scale is divided into two factors, comfort and knowledge, each consisting of 10 items. Both factors can have scores with a range from 10 to 70. It could be the case that one video has more effect on factor 1 and the other has more impact on factor 2. Therefore the same multi-level analysis is performed for factor 1: comfort and factor 2: knowledge as was done for the DAS score.

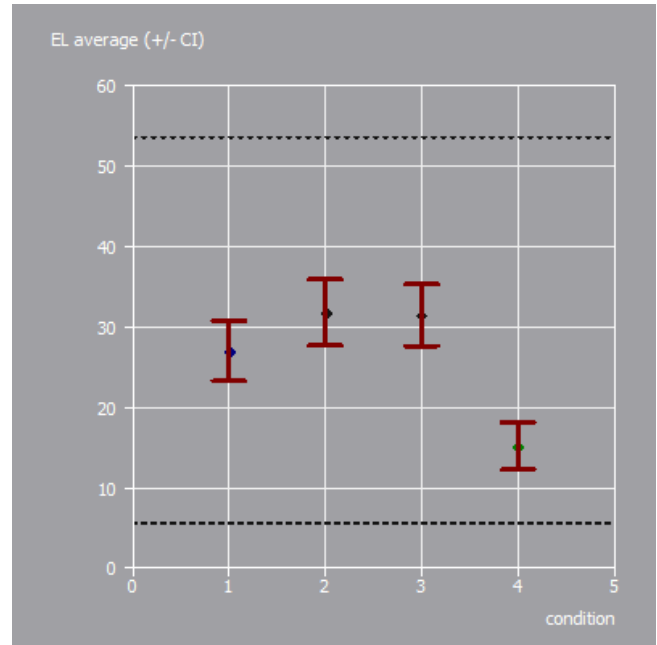


Figure 8: Factor 1 (comfort) after multi-level analysis.

ANOVA analysis gives $F(3,77) = 19.099$ ($p=2.34885e-09$) which shows that there is a difference between the means of the groups. The results from the Post-Hoc analysis in table 6 shows that there is only a significant difference between the baseline and the other perspectives but not between the three perspectives. From this, it becomes clear that showing a video about dementia results in a higher score regarding comfort but it does not explain which perspective results in the highest score.

	Confidence interval	P	Significant
1-2	-9.67994,0.0731549	0.0535194	No
1-3	-	0.0752629	No
1-4	6.95077,16.7039	6.85081e-06	Yes
2-3	-4.73106,5.38205	0.898373	No
2-4	11.6394,21.622	4.08705e-09	Yes
3-4	11.2487,21.3618	1.02325e-08	Yes

Table 6: Post-Hoc test factor 1 vs Video

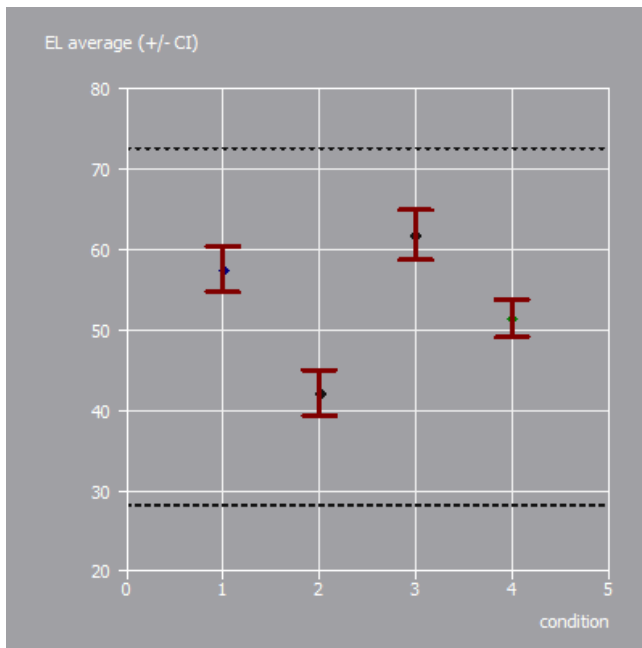


Figure 9: Factor 2 (knowledge) after multi-level analysis

The ANOVA analysis shows that there is a difference in means between the groups: $F(3,77) = 40.104$ ($p=1.02772e-15$). The Post-Hoc analysis in Table 7 shows that all the differences between the means are significant and therefore it can be concluded that group 3 had on average the highest score on the factors knowledge, followed by group 1, group 4 and lastly group 2.

	Confidence interval	P	Significant
1-2	11.704,19.0868	2.66051e-12	Yes
1-3	-8.03044,-0.546506	0.0252895	Yes
1-4	2.39471,9.77756	0.00155067	Yes
2-3	-23.5115,-15.8562	5.11628e-16	Yes
2-4	-13.0875,-5.53095	5.0935e-06	Yes
3-4	6.54692,14.2023	7.28916e-07	Yes

Table 7: Post-Hoc test factor 2 vs Video

DISCUSSION

The goal of this study was to find out if there is a relation between the perspective from which a video is watched and the attitude that people have towards people with dementia. From the results of the study it becomes clear that showing a video of someone with dementia results in a higher DAS score compared to the baseline video for the first and third perspective. Furthermore, it can be concluded that showing a video of someone with dementia increases the comfort that participants had regarding a person with dementia compared to the baseline video, which is corresponding to related work [5, 7, 11, 13, 26]. However, for the factor comfort it does not become clear which perspective has the highest score compared to the baseline and had therefore the most effect. The last finding of this study is that the first and third

perspective had a higher score compared to the baseline on the factor knowledge, while the second perspective resulted in a lower score than the baseline on this factor. This shows that the first and third perspective increased the knowledge on dementia for the participants compared to the baseline but the second perspective did not. In contrast to the related work [6, 10, 12], the third perspective has, on average, the highest DAS score and highest score for the factor knowledge.

Limitations

This study has some limitations. First of all, the sample size of this study is not ideal, as can be seen in Table 8. This table suggests that for part of the comparisons more measurements are needed. Ranging from 63,4 more measurements (1-2 for DAS) to 140.7 more (1-2 for factor 2) with an extreme of 29.132,22 more measurements for the comparison between 2 and 3 for the factor comfort.

Another limitation is that participants of the study were gathered via Prolific and therefore are paid for their efforts. The effect of this could be that people try to finish as many surveys in as little time as possible and therefore do not consciously answer the questions. Part of this bias is removed by the attention check question that ensures that people watched the video. However, the participants could still fill in answers with little consideration. Another bias that could be caused by the use of a platform as Prolific is that the stigma differs in every country [1] and that this can influence the outcome of the DAS score. However, as mentioned in the results section, the only variable that had a major influence was the Level of Contact score.

As mentioned before, the content of the videos could cause a bias for the participants. A way to remove this bias is to let the participants watch the same scenario from different perspectives. However, the researcher is not specialized in video making and therefore the quality of the video could also have an influence on the outcome of the DAS score. Future research could use the outcomes of this study to build onto further and eliminate this bias. Designers can also use the outcomes of this study when designing a stigma reducing video intervention.

CONCLUSION

This study shows a first step towards understanding which perspective can be used best when improving people's attitudes towards people with dementia via a video. Based on the current findings it can be concluded that in the setup of this study, the third perspective video resulted in the highest scores for the Dementia Attitude scale and the factor knowledge. For the factor comfort it can only be concluded that showing a video with the subject dementia in it resulted in a higher score than the baseline video. These findings enable various opportunities for further research and stigma reducing design interventions.

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APPENDIX

Reflection

At the beginning of this project, I wanted to focus on the expertise area technology and realisation and create an interactive design that could be used in the research. During the project I have decided to shift into a different direction because that appeared to be more suitable. Because of this, I have not achieved the goals that I had in mind at the beginning of this semester. However I did gain a lot of knowledges in areas that I did not expected to in the beginning.

The largest learning points of this project for me were that I can conduct a quantitative study and analyse it, and that my interests are not solely focused on patient related problems. During the project I have implemented expertise areas except for technology and realisation. However, since part of technology and realisation is related to math, data and computing, especially data analysis. Therefore, improvements regarding both expertise areas are established. Data analysis with use of statistics was very new to me. I had some courses regarding data analysis in the bachelor, but the examples that these courses used are not related to the way data analysis was needed for this project. Because this way of analysing was new to me, I started by investigating the best methods for my study and asked Carlijn for her opinion on my study setup and analysis plan. Besides that, I asked a friend that studies data science if the steps that I took were the right ones, he was quite impressed and proposed some alternatives. I could explain to him why I chose the current method and not the alternative, which increased my understanding in the subjects and helped me to get confident of the choices made.

Another expertise area that I did not implement completely is creativity and aesthetics. I chose to use existing material for the research prototype. I carefully sought and edited the existing video's so that they are representing the right perspective. The reason that existing material is chosen instead of own created material from the same scenario is because I have never made a video with actors of high quality. It was chosen to use video's as prototypes since they can transfer emotions better than for example written scenarios or storyboards. I therefore, chose not to focus on this expertise area and build onto other people's specialities. I have learned that in some cases it is better to outsource certain aspects of a project instead of doing it yourself with the risk of less quality outcome.

The project was started for the openluchtmuseum in their development of the house of memories. This is taken into account during the whole process, even though the outcome is more generalized and can be applied in other areas too. Because of this,

the chances are higher that the findings come to use to help to reduce the stigma and therefore improve the lives of people with dementia and their environment. This was the first study for me that involved a large amount of users and validated scales. I have learned that this way of working gives more confidence in the results since the amount of participants represents society better and since the questions of the scales are validated and used in previous studies, the feeling of forgetting something is less. In previous qualitative studies I sometimes got this feeling after analysing the data. For a future study I would like to use mixed methods to be able to have the benefits of both quantitative and qualitative methods.

As I mentioned before, sometimes help was needed to go in the right direction. Looking back, I would have liked to narrow the research down earlier in the semester. However, I feel like I have set up a study based on a lot of literature research and therefore found a niche. I needed some help from my coach to decide that this was the way to do the research. I also used the help of Carlijn to set up my study in a way that data analysis was taken into account and all decisions are considered thoroughly.

I always thought that I wanted to be a researcher that uses design to gather knowledge. However, in this project I have not used design to gather knowledge but created new insights for designers. I also focused on qualitative research so far and thought that quantitative research and the analysis of it was not something that I could do or would enjoy. This might also be the reason that the first part of the project took longer than anticipated, I did not dare to think of options for quantitative research because I was afraid that I would not be able to do the analysis. However, this project has learned me that I enjoy doing quantitative data analysis and diving into statistics. In the past I wanted to focus on technology and realisation, however I noticed now that math, data and computing correlates with my interest. Before this project, I have mostly focused on healthcare problems regarding the patients. In this project I have focused on the society instead of the patient, and I have noticed that I like finding a solution for these kinds of problems too. For my M2.1 I want to do a project for a societal organisation to find out if this fits my interests and to see how I can be of a contribution there. I want to help people with the research that I do and the designs that result from that. I want to help to improve the mental quality of life of people who struggle with their health, but also their relatives because they mostly also get mentally affected by the health problems of their loved ones. So far, I have done this on a personal level, with this project I have learned that it is also possible to apply this to a societal level.

Survey

Consent form

Dear Participant,

You have been invited to take part in the following study. It is important to note that participation is voluntary, and it requires your written consent. Before you decide whether you want to take part, please read the information provided below carefully. If you have any questions or concerns, you can send an email to: j.c.b.d.leeuw@student.tue.nl

1. General information and purpose of the study

For the master Industrial Design I am investigating the effect that a video has on the attitude of participants towards dementia.

2. What participation involves

- At the beginning of the survey, you will be asked to fill out a general demographic questionnaire to gather some information about you so that certain conclusions can be drawn based on demographic information of the participants.
- Secondly, you will watch a video and answer multiple choice questions.
- There is no right or wrong option. It is merely your opinion on how you feel towards a person with dementia. We do not constitute an opinion on your behavior.

3. If you do not want to participate or you want to stop participating in the study

It is up to you to decide whether or not to participate in the study. Participation is entirely voluntary.

During the study, if you change your mind and wish to withdraw your participation from the study, you may do so. You are not obligated to state any reasons for withdrawing your participation. You can also choose to remove your data upon withdrawal from the study.

4. Potential benefits and risks for your participation

As a participant, you will share how you feel towards a person with dementia. Besides that, you will watch a video. You will not be at risk at any point. The experiences that you have can help to understand what the effect of the video is and this information can be used in further research.

5. Usage and storage of your data

In this study, we are collecting and storing data from you, such as your answers to the survey. Researchers may use the outcomes and general demographic information for scientific publications. All data will be anonymized. Therefore, your personal identity will remain confidential.

With this form, we ask your permission for the use of your data.

Confidentiality of your data

To protect your privacy, your data will be anonymized. Any information that can directly identify you will be omitted. The data cannot be traced back to you in reports and publications about the study.

Access to your data for research and verification

Some people can access your data in the Eindhoven University of Technology, including the survey data: researchers who will analyze the data and the committee that monitors the safety of the data. They will keep your data confidential.

Your data must be kept for five years after the ending of this project, that is, until July 2026, at Eindhoven University of Technology.

More information about your rights when processing data

For general information about your rights when processing your personal data, you can consult the website of the Dutch Data Protection Authority.

6. Any questions?

If you have any questions about your rights or complaints about the study, please contact Jeanine de Leeuw, e-mail: j.c.b.d.leeuw@student.tue.nl

If you have questions or complaints about the processing of your personal data, you can also contact the Data Protection Officer of Eindhoven University of Technology, email: dataprotectionofficer@tue.nl or the Dutch Data Protection Authority.

7. Signing the consent form

Please decide on your participation after sufficient reflection. We will ask you to confirm this by marking the box below.

By signing the consent form, you indicate that you have understood the information and consent to participation in the study. The signed form is kept by the Investigator. If you would like to receive a copy of this, you can request this via email to j.c.b.d.leeuw@student.tue.nl.

I have read the subject information form. I was also able to ask questions. My questions have been answered to my satisfaction. I had enough time to decide whether to participate.

I know that participation is voluntary. I know that I may decide at any time not to participate after all or to withdraw from the study. I do not need to give a reason for this.

I give permission for the collection and use of my data to answer the research question in this study and to use it for future research in the field of the research.

I know that all the responses are archived are kept confidential. The ideas and responses can be used as part of project reports and publications.

I know that some people may have access to all my data to verify the study. These people are described in this information sheet. I consent to the inspection by them.

Demographic questions

What is your age?

- 18-25
- 26-35
- 36-45
- 46-55
- 56-65

What is your gender?

- Man
- Woman
- Non binary

Prefer not to say

What is your education level

- No education
- Primary school
- High school
- Bachelor's degree
- Master's degree
- Ph.D. or higher
- I do not know/ I prefer not to say

In which country do you live?

Is English your most proficient written and spoken language?

- Yes
- No

Level of contact scale

	Never	Rarely	Occasionally	Moderately	A great deal
I have come across people living with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have spent time with people living with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have spent time with a family friend who is living with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have spent time with a family member living with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have looked after someone living with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have watched TV shows or movies in which a character has dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have come across adverts (e.g. billboards, leaflets) about dementia in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have come across people living with dementia on social media (e.g. Twitter, Facebook)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have searched for information on dementia on the internet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have learnt about dementia in school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have spoken to family or friends about dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Assigned video

Attention check question (differs per video)

1. What groceries from the list could the woman not find?

2. What groceries does the woman have trouble identifying?

3. What did the son have to do before getting coffee?

4. What do you have to pay attention to when watering your plants?

Dementia Attitude scale

	Strongly disagree	Disagree	More or less disagree	Neutral	More or less agree	Agree	Strongly agree
It is rewarding to work with people who have dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am afraid of people with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People with dementia can be creative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel confident around people with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am comfortable touching people with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel uncomfortable being around people with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Every person with dementia has different needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am not very familiar with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would avoid an agitated person with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People with dementia like having familiar things nearby	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is important to know the past history of people with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is possible to enjoy interacting with people with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel relaxed around people with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People with dementia can enjoy life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People with dementia can feel when others are kind to them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel frustrated because I do not know how to help people with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I cannot imagine caring for someone with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I admire the coping skills of people with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can do a lot now to improve the lives of people with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficult behaviors may be a form of communication for people with dementia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What is your Prolific worker ID?

[Link back to Prolific](#)

Data analysis

For the data analysis, ILLMO version 1.7 is used. The manual of Jean-Bernard Martens is used regarding the confounding variable: <https://www.youtube.com/watch?v=LI1hIceum5w>. After this is done, the statistical analysis were performed as mentioned in the results. The unfiltered data can be found in the data foundry. If the assessors need the processed data, this can be requested through an email to j.c.b.d.leeuw@student.tue.nl.