Data-driven similarity scoring in matching refugees and native Dutch people

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ABSTRACT

The past few years, the Netherlands received serious amounts of refugees that had to flee because of war or other grounded reasons. The men mostly leave the country on their own, and if their asylum application is approved, the family will follow up. Years of learning the language, housing and getting a job will follow up, but the social integration with Dutch people is often found difficult. They often feel lonely and find it hard to find a way to connect to Dutch people. Finding a suitable match is not easy, which is also seen in other domains, such as online dating. In this field, things have changed over the years; computers became more skilled in matching two persons and help to find a relationship. The use of personal data and algorithms has played a role in this. In the area of social integration, there are no applications where these new technologies are applied. This paper will take a closer look at what is required for this connection and how a suitable machine learning technique and algorithm can help to find a suitable match between two people and the supplied data.

Keywords: Friendships; Similarity scoring; Clustering algorithms; Matching programs; Social integration; Social inclusion;

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INTRODUCTION

Every year the Netherlands receives a certain number of refugees that are forced to leave their country because of violence or persecution. These people are not able to receive this protection in their own country and have to leave. In the past decade, several wars in the Middle East occurred, which caused multiple refugee influx spikes through Europe. The most significant influx of refugees appeared in the year 2015 when the Syrian war forced millions of people to leave the country. In that year, the number of asylum requests in the Netherlands rose to nearly 60 thousand. The largest groups of the past couple of years come from Syria, followed by Nigeria and Iran (Vluchtelingenwerk Nederland, 2019). Multiple terms are used to refer to persons that recently started living in a new country. According to the United Nations High Commissioner for Refugees, UNHCR in short, the term 'refugee' applies to those who have a grounded fear of prosecution 'for reasons of race, religion, nationality, membership of a particular social group, or political opinion' (UNHCR, 1951). The term' asylum seeker' applies to people for whom this fear had not been confirmed by research yet, and for which a negative result could mean that the person will be sent back to his or her country'. This study will focus on refugees that already received their asylum because at that moment, the process of integration will start.

Asylum seekers that receive their asylum are then designated as 'refugees' and will enter a program to integrate into the Dutch society. Language courses, housing and work placement, are the first things that are taken care of, but social integration is just as important (Krasnova et al., 2018). Recent studies have shown that new people in the Netherlands often feel lonely and struggle with making friends and creating social relationships. EenVandaag (2017), a current affairs programme that broadcasts on Dutch public television, has interviewed more than a thousand refugees about life in the Netherlands and how they experience their integration. Half of the Syrians who have fled

from their country from 2015 to 2017 experience feelings of loneliness lonely and have a hard time establishing contact with Dutch people. A quarter (24%) of the people hardly have any contact with Dutch people. The amount of new people having Dutch friends is not high, although this is an essential indicator of the success of integration (KIS, 2018). Nine out of ten would like to have more Dutch friends, but they find this difficult to achieve. One participant of the research (2017) explained this answer with the following comment: "*Because we hardly see Dutch people, never talk to them. I have not yet found a way to contact them and get to know them.*" Young Syrian men, in particular, indicate that the language barrier stands in the way of good contact with Dutch people. Syrian people often feel lonely in the Netherlands also has to do with the fact that they usually arrive alone and leave their families in their home country (VluchtelingenWerk Nederland, 2019).

Successful social integration into the host country requires effort from both the newcomers as well as the natives (Berry, 2011). This results in a question from the refugee and an offer from the person who is willing to get in contact with them. In the Netherlands, several solutions exist for bringing Dutch people and refugees in contact with each other. There are multiple non-profit organizations that concern themselves with the right match between two persons. These solutions are based on the contact the refugee has with the organization and the Dutch person has with the organization. This middleman will do their best to find a suitable match, but the match will be a guess and whether it is a success remains to be seen (Vluchtelingenwerk Nederland, 2020). Most solutions are based on a matching procedure with a human input, which goes through an organization. Still, not everyone is connected to these organizations, and it can be an obstacle taking this step. These are the solutions that exist, but apps where more data is required, and a match will be made looking at the similarity in data with the use of an algorithm does not yet exist. One aspect of this study will be to out what a friendship needs to comply to and what has the most value in friendship, listening to both the refugee as the hosting group. On the other side, there will be

experimented with different algorithms and machine learning techniques to find the ones that fit the best to this case. This poses the following research question:

What are the requirements for a data-driven application where native Dutch people and refugees are matched?

THEORETICAL FRAMEWORK

SOCIAL INTEGRATION

The goal of this project is to contribute to the process of Dutch integration with refugees, for this reason, a close look has been taken into the sociological view on what integration is. Integration is a process of socialization where people from a non-dominant group mix with a dominant group, while maintaining contact with the other members of their group. The non-dominant group must accept the fundamental values of the dominant group, while the dominant group must adopt national organizations to meet the needs of the non-dominant group. Integration can only be successful if there is a cooperation between two sides. Acceptance of multiculturalism is necessary, which means that there are relatively few prejudices, racism, and discrimination (Berry, 2011). When a person is successfully integrated, as well from a social perspective, they will feel like a part of a community, connected by a shared identity and shared values. When thinking about the aspects of integration, learning the language, finding work, education, and housing are often thought of first. Apart from these aspects, also social factors play a role in successful integration. This theory can be explained in Maslow's hierarchy of needs. In the first tier, a person will long for physiological needs such as food, water, shelter, clothing, etc. After the physiological needs, the safety needs will follow up; personal security, health, employment, property, etc. The social aspect, where this project will play a role, comes next. According

to the theory, this tier can only be reached when the passed two tiers are taken care of. The third tier goes under the name 'Love and belonging' and covers the needs of friendship, intimacy, family, and sense of connection' (Maslow, 1943).

SOCIAL INCLUSION

Refugees can be regarded as a group to which the social inclusion process is of great importance. Social inclusion is defined by Beck et al. (1997) as 'the process in which excluded or new groups find their place in the social networks of the host society, whereas incumbents provide them space and opportunity to do so.' Social inclusion depends on the refugees' ability to navigate through social connections and create a sense of social connectedness. This connection with other people and society leads to a sense of comfort, well-being and a reduced sense of anxiety. The connection with this social network will help the refugee feel less stressed in the acculturation process (Krasnova et al., 2018). Having social contacts with friends, family, and community creates a feeling of being connected, being part of a community, and being cared about. For the creation of a sense of belonging and identity, participation is essential. Being part of a social network will provide emotional support, which is helpful in times of challenges. This social network can prevent someone from getting caught up in multiple disadvantages when one disadvantage (such as unemployment) occurs. The social network of refugees includes both the network that exists back home with friends and family as the addition of a new network with locals. The network with locals develops a sense of belonging among refugees. The providing of emotional support from back home will help the person contributing to the settled feeling and engage with the local community and broader society (Krasnova et al., 2018).

MALE FRIENDSHIP

This project will contribute to improving the connection between refugees and locals. To reach this goal, knowledge is required about what makes a connection between two people valuable and meaningful. To gain this knowledge, social psychology research is being conducted. Since the majority (75%) of the refugees that arrive in the Netherlands are male, research concerning friendship between two males is consulted (UNHCR, 2018). This does not mean that women's friendship is left out, but the majority of the target group is male, so a male-orientated approach useful. Listening to professor of sociology Geoffrey Greif (2009), many male friendships revolve around an activity. The friendship exists mostly around activity and is mostly in the act of a meeting in which their partners or spouses are not interested in, such as meeting each other to watch sports or to play sports together. Greif explained men's friendship as 'shoulder-to-shoulder' interactions; when women get together, it is rather seen as 'face-to-face' interactions (Greif, 2009).

The demand for the connection with native Dutch people has been shown in aforementioned research, but for the connection also, the Dutch populations willingness' is needed. For this, research has been conducted among Dutch people in 2017. The Dutch governmental institution Statistics Netherlands has applied research on the experience of Dutch people in regard to refugees. It appeared to be that 77 percent of the Dutch population believes that the Netherlands should receive refugees who have fled their country due to war or persecution (N=3339). Nearly two-thirds of the adults are willing to help a refugee with everyday things if they come to live in the street with him or her, 13 percent would not. Women indicate more often that they want to lend a helping hand than men. The contact people had with refugees appeared to be essential; of the people that came into contact with

refugees, the attitude towards refugees more often changed positively as opposed to negatively (Kloosterman, 2018).

THE RISE OF ONLINE FRIENDSHIPS

Nayak, Zhang and Chen (2010) have found that due to a change of attitude and lifestyle, people expect to find new partners and friends in a more diverse way than just offline. The expectations of users have increased, and online matching companies are trying to adopt more and more recommender systems to match people with each other. A generation is emerging where finding friends or partners online is more and more regarded as an ordinary matter. Lenhart (2015) found that videogames, social media and mobile phones play an integral role in how teens meet. Friendships more and more start online: 57% have met a friend online, where boys (61%) are more likely to fiend friends online than girls (52%) (N=1060). Also, among adults of an earlier generation than the nowadays teens, the internet provides an essential alternative environment to maintain relationships and make new ones. This alternative environment can be helpful for when there is a transition phase that adults experience (e. g. high school to college, college to work), which can be accompanied by a heightened sense of loneliness (Baker, 2012). Transitions, such as leaving university or moving from country to country, disrupt earlier connections and earlier found security. These transitions require emerging adult to establish new friends (Asher & Weeks, 2014).

HOMOPHILY IN SOCIAL NETWORKS

McPherson, Lovin and Cook (2001) found that people with similar interest tend to connect to each other and are more likely to be friends; similarity breeds connection. This

social phenomenon is called homophily and structures network ties of every type, including marriage, work, support, friendship, and other types of relationships. This fundamental mechanism drives the dynamics of a social network. The result of this phenomenon is that personal networks of people are often homogeneous, which leads to similarities in sociodemographic, behavioural and interpersonal characteristics. When two people share common characteristics, communication and relationships formation develops more smoothly.

METHODS

For field research, a survey has been conducted, which included the native Dutch people as well as well as the refugees. The survey consisted of questions regarding friendship and experiences when people meet each other for the first time. Also, features of the prototype were questioned. The survey consisted of both questions that helped in qualitative research as in quantitative. The questions that led to qualitative results were asked in an open form, and the participants were free to answer without being guided with proposed answers. The quantitative questions were asked in a multiple-choice format. The personality statements that are selected in the multiple-choice questions are inspired by a company called 16Personalities (n.d.), which provides statements that determine a personality type. These statements were presented in the survey, and the respondents were asked to choose the ones they thought help matching two people. This multiple-choice question was also used for hobbies and interests. The interests and hobbies that were suggested were inspired by research that has been done on Leisure activity preferences and perceived popularity in early adolescent by Bruyn and Cillessen (2008). The main goal of the survey was to discover what the target group defines as having a feel of a connection. Answering this question could not only be done by only qualitative data or only quantitative data. That is why a combination is applied. From the origin, the plan was to ask the open questions in an interview, but multiple organizations that are in contact with refugees did not cooperate with this activity, due to the outbreak of Covid-19 and

the avoiding of social contact moments. For this reason, the questions have been asked in a survey, and the participants were free to answer in text. The survey consisted of 11 questions and has been sent on the 28th of September 2020 and lasted until the 5th of October 2020.

Sample description

The survey has been spread in a WhatsApp group chat of 256 people. All of these people are of foreign descent and moved to the Netherlands in the past few years. The spreading of the survey is done with the help of Muataz Salam, a 41-year-old man from Yemen, who also participated in the survey. In total, nineteen people of this group chat responded to the survey. For the second target group, the native Dutch people, the survey has been spread in several groups chat where young adults are in. For this target group, 26 people have participated, which makes the ratio 42/58. In total, 45 people have participated in the questionnaire.

The survey started with three demographical questions, which gave more insight into the participants. Some participants only lived in the Netherlands for three months and others have been living in the Netherlands for five years. The average age of the refugees that participated was 34 years old, where no one was younger than 20 and no one older than 45. The vast majority of the participants (16/19) identified themselves as male, 2 of them preferred not to say, and one was female. Of the 26 Dutch people that participated, 18 people that participated identified themselves as male, eight people identified themselves as female. The average age of the native Dutch participants was 24 years.

Privacy

The data were collected anonymously; there were no questions that could reveal the identities of the participants. The participants could continue without giving personal data such as

their first- and last name, location or IP. The participants were made aware of this in the introduction text.

Software needed

For the screen design process, InVision Studio is installed. This software allows one to design the screens and create the prototype. The prototype can be tested directly in the program. The clickable prototype can be saved in an updatable link that is accessible to access for everyone with a link. Creating the model and working with the data will be done with the help of Anaconda-Navigator, whence Jupyter Notebook is accessible. The programming language where the model is created will be Python.

Main question

What are the requirements for a data-driven application where native Dutch people and refugees are matched?

Sub questions

What values are an indication of 'having a sense of connection' with someone new?

To what extent is having a similar personality profile beneficial to the process of matching two people?

To what extent is having similar interests and hobbies beneficial to matching two people, and which hobbies and interests help to match?

Which algorithm and machine learning technique is the most suitable with the goals of the application?

RESULTS

In this section, the findings of the survey will be presented, and the sub-questions will be answered with the collected data. The last sub-question will be answered in the technical documentation.

Terminology

The two target groups that are involved are refugees and native Dutch people. This target group has been divided after the following question (Figure 1):

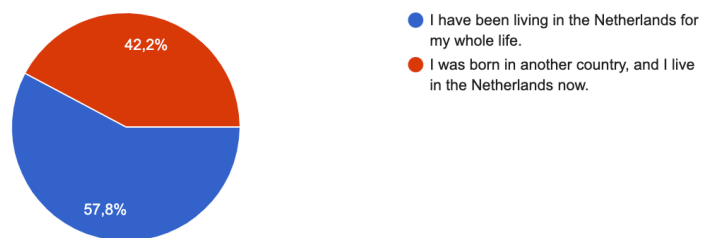Please check the box that applies to you

45 antwoorden

● I have been living in the Netherlands for my whole life.
● I was born in another country, and I live in the Netherlands now.

Figure 1. Target group division

To describe the target groups more easily, the following terms will be used:

- *I have been living in the Netherlands for my whole life* - Native Dutch people.

- *I was born in another country, and live in the Netherlands now* - Refugees.

It can be that a person that has filled in the survey (and answered B) is not a refugee, but since the survey has been spread in a groups chat in which the most prominent part had to flee to the Netherlands, this term is used.

FRIENDSHIP VALUES

The target groups indicated various aspects that increased the feeling of a connection after they met someone new. They noted that having the same mindset matters to feel connected to someone, also the same sense of humour, having the same view on life, and having similar interests helps. Additionally, being heard matters, and having mutual respect and being honest to one another are factors that were heard in the answers to this question. The answers that have been given are summed up in Table 1.

Native Dutch	*Refugee*
If talking goes smooth'	Same interests and the same humour'
'Having the same mindset'	Speak up'
'vibes, same interests, being able to learn from each other'	if you have similar subjects where you both know how to talk about'
Afterwards, when you realise you enjoyed the time you spent together'	goals in life. And good conversation. Understood the difference between peoplel'
Same sense of humour'	Human should have respect for other people and honesty …'
That the other person is open minded and has the same views on life as you do, even if there is a big cultural difference.'	Acceptance'
Same sense of humour'	Mutual interest'
Sharing personal stuff with each other and feeling heard by the other person.'	Question from time to time and check on him from time to time.'
'Dat je een goed gevoel aan het contact hebt overgehouden'	Honesty'

'Having a laugh and knowing that you're on the same page. Not having the same opion but more like looking at life sort of the same way.'	
'same kind of humor, that you are not too irritated by certain characteristics of the other person'	
'Common grounds'	
'There must be understanding for each other and the click must just be there"	
'Genuine laughter and interest'	
'interesting conversation flow'	
'When you feel the need to share stuff with them. Doesn't matter how big or how often you want to share.'	
'Funny, good conversation, shows interest and is interesting to talk to'	
'I think having the same sense of humour can create a quick feeling of connection'	
'Mutual respect'	

Table 1. Responds on what both target groups think is important in order to feel a connection with someone

PERSONALITY/INTEREST MATCHING

Having hobbies and interests in common

A relevant matter to cover is the question of whether the target group thinks it is essential to have the same interest and personality profile. By answering this question, it is made sure that the variables the participants are matched on, will contribute to the feeling of a connection between two persons. 73.1% of the native Dutch people (Figure 2.2) think it is important to have similar interests, against 47.4% of the refugees (Figure 2.1), which brings the total mean to 60.4%.

Do you think it is important to have similar interests or hobbies when you're becoming friends with someone?
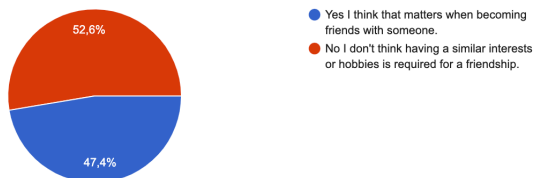
19 antwoorden

- Yes I think that matters when becoming friends with someone.
- No I don't think having a similar interests or hobbies is required for a friendship.

52,6%

47,4%

Figure 2.1

Do you think it is important to have similar interests or hobbies when you're becoming friends with someone?

26 antwoorden

- Yes I think that matters when becoming friends with someone.
- No I don't think having a similar interests or hobbies is required for a friendship.

26,9%

73,1%

Figure 2.2

Having a similar personality profile

The minority of both target groups (mean = 33.1%) indicate that having a similar personality is not important when becoming friends with someone (Figure 3.1 and Figure 3.2) (N=45).

Do you think it is important to have a similar personality when you're becoming friends with someone?
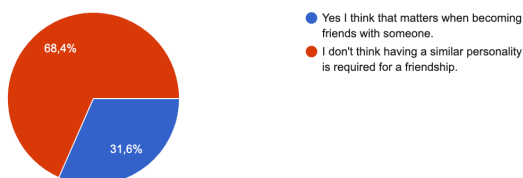
19 antwoorden

- Yes I think that matters when becoming friends with someone.
- I don't think having a similar personality is required for a friendship.

68,4%

31,6%

Figure 3.1

Do you think it is important to have a similar personality when you're becoming friends with someone?

26 antwoorden

- Yes I think that matters when becoming friends with someone.
- I don't think having a similar personality is required for a friendship.
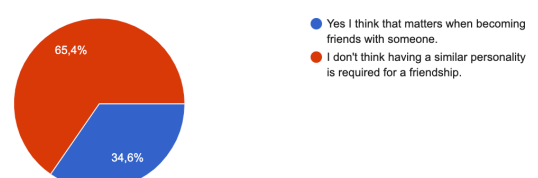
65,4%

34,6%

Figure 3.2

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Weight distribution

In the application, ten statements to will be proposed to give an indication of value to. The distribution of statements for the interest category and the personality category will be based on the aforementioned results of the survey. Because there is more of a weight to have similar hobbies and interests than having a similar personality profile (60.4% versus 33.1%), the ratio will be 7/3. If the app would grow, the number of questions could increase and become 14/6 or 21/9. Although the majority of the participants think having similar personality types does not contribute to the sense of connection with someone, it is not entirely left out. Keeping it partially in the application also has to do with the fact that other research has found contradicting results (McPherson, Lovin and Cook, 2001).

DEMOGRAPHICAL MATCHING

Next to the questions that relate to interests and personality aspects, three questions that have more of a demographical background have been asked. The target group have been asked whether they think these aspects are important as grounds of commonality when becoming friends with someone.
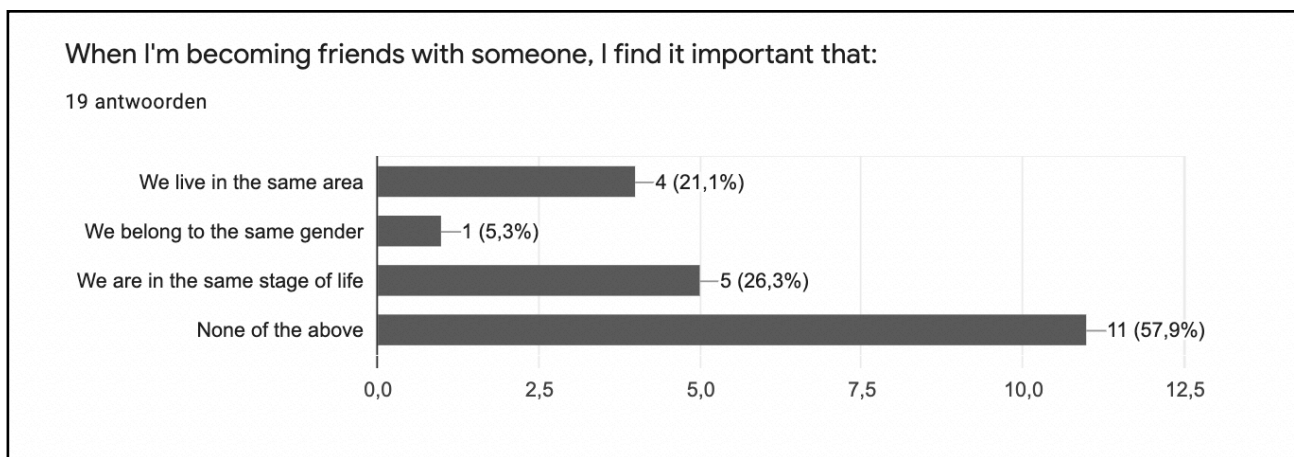

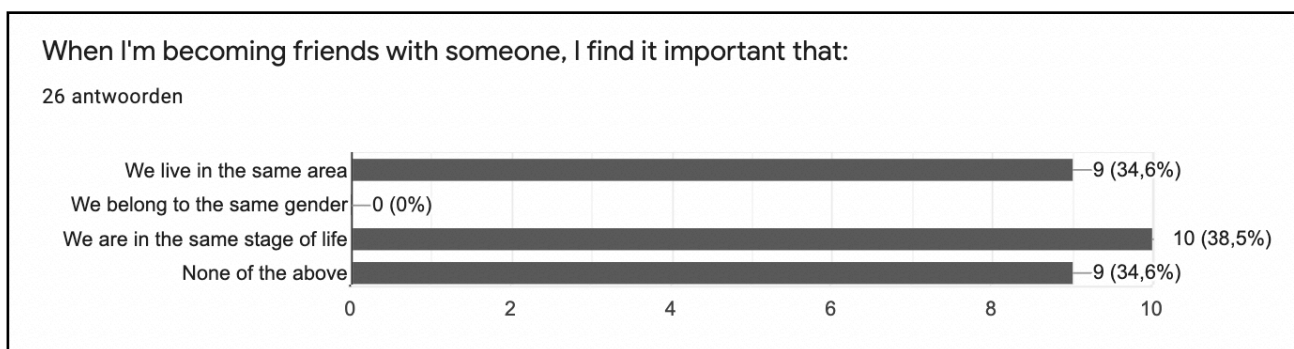*Figure 4.1 Importance of demographical similarities, listening to refugees (N=19)*

Figure 4.2 Importance of demographical similarities, listening to native Dutch people (N=26)

The majority of both target groups did not think it is important to have these aspects in common; 28.8% of the participants think it is important to live in the same area; 46.7% thinks it is important to be in the same stage of life and just one person out of 45 thinks the gender matters. For this reason, these aspects are left out in the matching procedure

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LONG- TO SHORTLIST

For the selection of the shortlist, the results of the survey will be applied. First, the selection for hobbies and interest will be made. In this question, 12 interests and hobbies have been proposed, the 7 statements that are voted for the most will be questioned in the prototype.
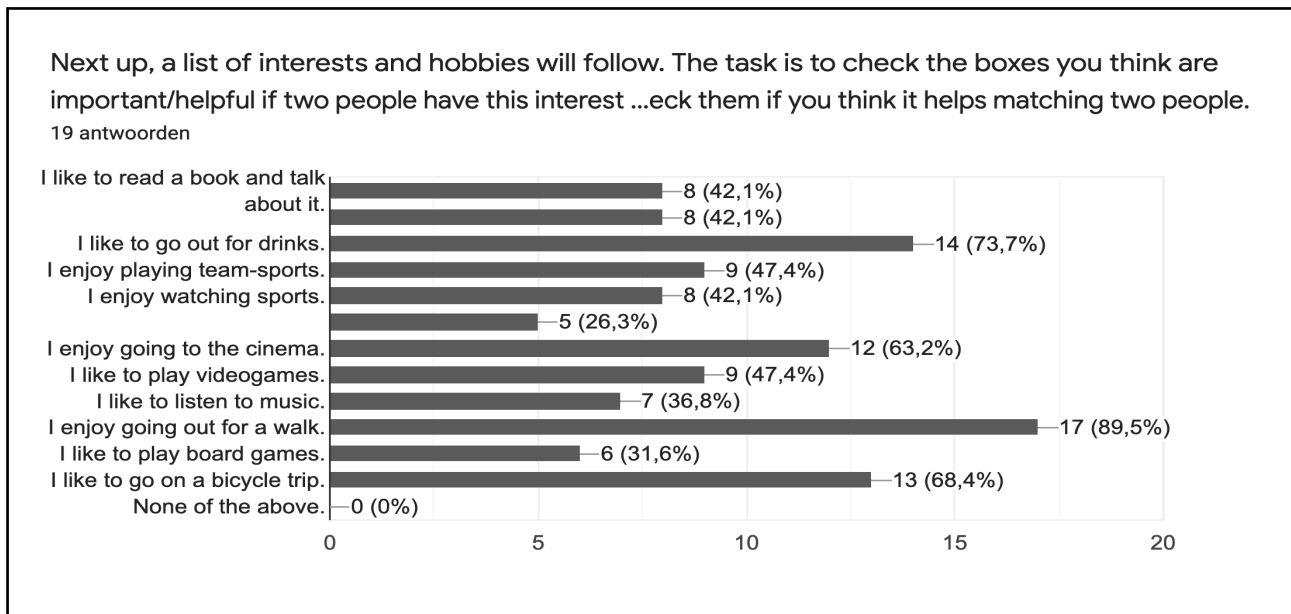

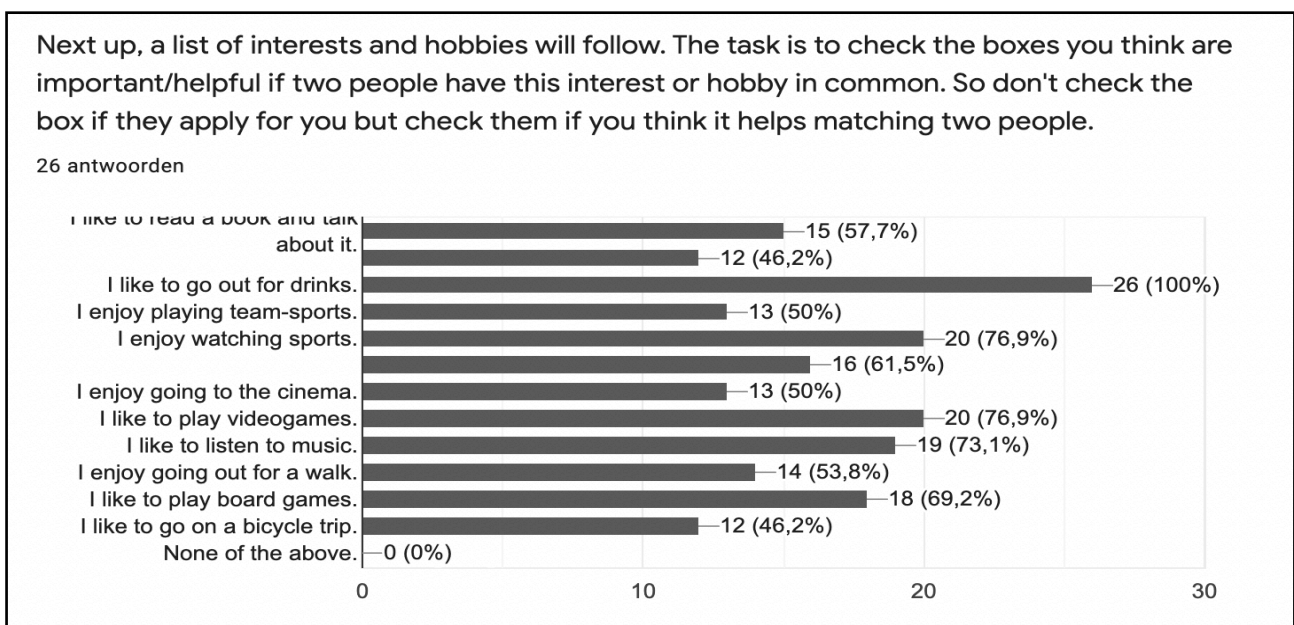*Figure 5.1 Importance of several interests and hobbies, according to refugees (N=19)*

Figure 5.2 Importance of several interests and hobbies, according to the Native Dutch people (N=26)
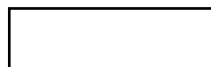
The results of the survey will now be compared, and a selection will be made. The total

percentage will be decisive for the selection of the shortlist (Table 2).

Hobby/interest	Native Dutch	Refugee	Total
Go out for drinks	26 (100%)	14 (73.7%)	40 (88.8%)
Go for a walk	14 (53.8%)	17 (89.5%)	31 (68.8%)
Play videogames	20 (76.9%)	9 (47.4%)	29 (64.4%)
Watch sports	20 (76.9%)	8 (42.1%)	28 (62.2%)
Listen to music	19 (73.1%)	7 (36.8%)	26 (57.8%)
Bicycle trip	13 (68.4%)	12 (46.2%)	25 (55.56%)
Cinema	13 (68.4%)	12 (46.2%)	25 (55.56%)
Board games	18 (69.2%)	6 (31.6%)	24 (53.3%)
Book	15 (57.7%)	8 (42.1%)	23 (51.1%)
Team sports	13 (50%)	9 (47.4%)	22 (48.9%)
Play an instrument	16 (61.5%)	5 (26.3%)	21 (46.7%)
Museum	12 (46.2%)	8 (42.1%)	20 (44.4%)

Table 2. Shortlist selection hobbies and interest

[ ]   Selected for shortlist   [ ]   Not selected for shortlist

In the following question, 5 statements that help with determining someone's personality have been proposed, the 3 statements that is voted for the most will be questioned in the app.
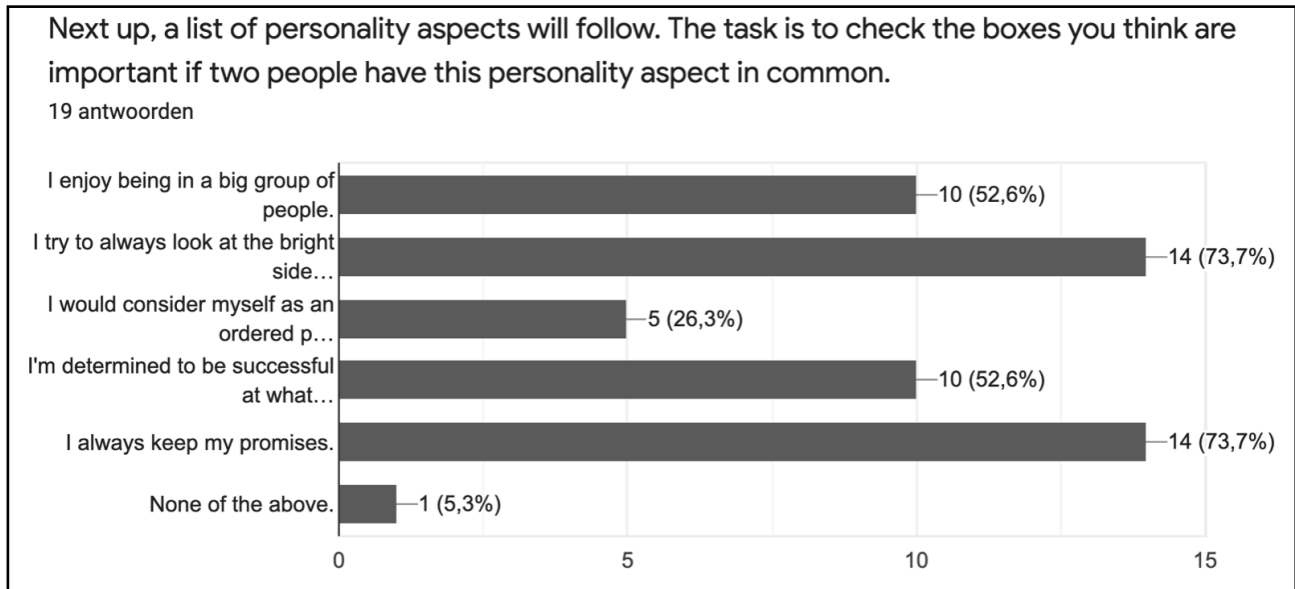

Figure 6.1 Importance of specific personality aspects, according to refugees (N=19)
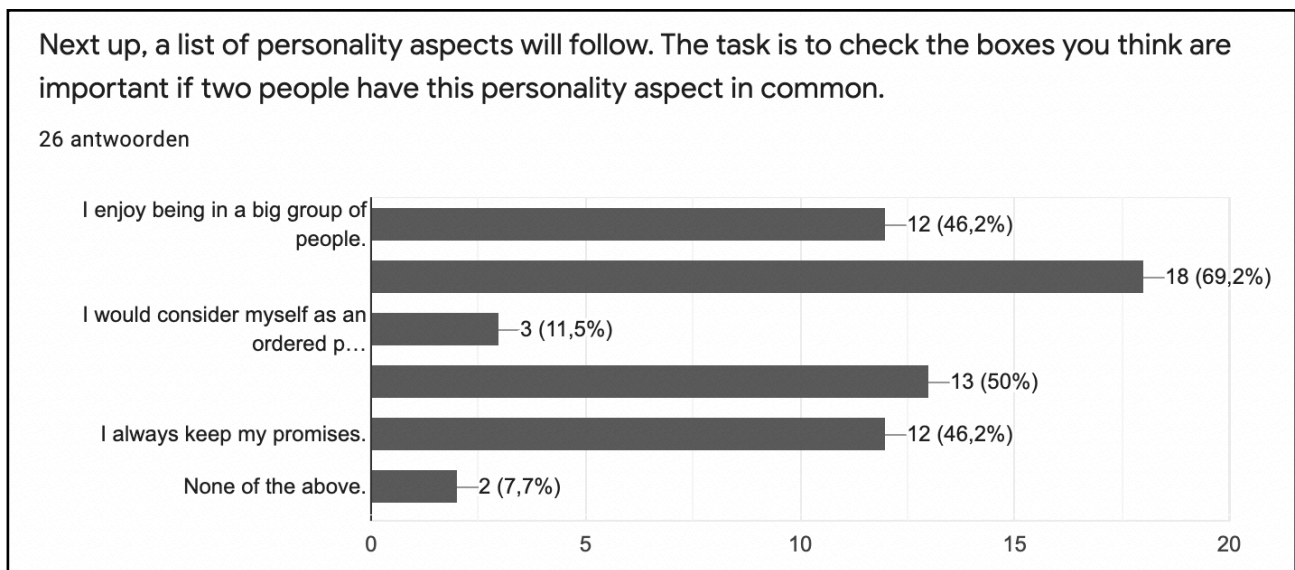

Figure 6.1 Importance of specific personality aspects, according to the native Dutch people (N=19)

The results of the survey will now be compared, and a selection will be made. The total percentage will be decisive for the selection of the shortlist.

Personality statement	Native Dutch	Refugee	Total
I try to always look at the bright side of life.	18 (69.2%)	14 (73.7%)	32 (71.1%)
I always keep my promises.	12 (46.2%)	14 (73.7%)	26 (58.8%)
I'm determined to be successful at what I do.	13 (50%)	10 (52.6%)	23 (51.1%)
I enjoy being in a big group of people.	12 (46.2%)	10 (52.6%)	22 (48.9%)
I would consider myself as a ordened person.	3 (11.5%)	5 (26.3%)	8 (17.8%)

Table 3. Shortlist selection personality statements
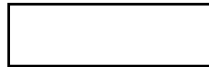
☐ Selected for shortlist   ☐ Not selected for shortlist

CONCLUSION

There are large amounts of refugees living in the Netherlands that had to flee from their country and to start a new life in the Netherlands. Men often arrive alone in the Netherlands, and the family will follow them later on. In the first years of integration, these people often experience loneliness and have a hard time establishing social relations with native Dutch people. This is not because native Dutch people are not open to this, but because there are not many ways to that help to find a suitable match between members of these two groups. This study has taken a closer look at what both sides think is essential when meeting someone new, what will help to have in common in the matching procedure and what will not. To conclude, both target groups think having similar interests and hobbies in common is more important than having similar personality aspects. It has also been found that the majority of the participants do not think it is important to belong to the same gender, live in the same area or to be in the same stage of life. Additionally, the target group rated the specific statements and helped in the decision making where to match two people on. The results of the survey served as the fundamentals of the solution that has been created, in the form of an application called Matched. In this application, the participants indicate which statements they regard as valuable by moving a value indicator from 0 to 10. The process that led to the final prototype can be found in the technical documentation.

DISCUSSION

This study aims to take part in the process of social integration of people that recently started living in the Netherlands and are willing to make friends. It appeared to be that loneliness is an issue among refugees, and finding a sense of connectedness with Dutch people is a difficult task. Digital matching procedures where personal data and machine learning are seen in other domains and have proven to be successful. In the world of matching Dutch people with refugees, this has not been done yet. This study takes a closer look at the possible use of personal data and machine learning in the matching procedure. From this viewpoint, the following research question has presented itself:

What are the requirements for a data-driven application where native Dutch people and refugees are matched?

In the survey that has been sent, a selection of the hobbies, interests and personality statements has been made. These statements are inspired by organizations specialized in creating personality profiles. In the survey, a selection of 17 statements in total were made and the participants were asked to choose the ones they think helps when matching two people. The 17 statements that formed the longlist have been selected without insights of the target group, which poses the question whether the same 17 statements would have been chosen, or different statements.

A problem that the research on the algorithm was confronted with is that there has been working with data that is not provided by the target group; the answers were generated randomly and not from real people. It was unavoidable to have 750 'real' participants, so this decision had to be made to experiment with the algorithm. This is also a downside of the application if it would be realised; it will be hard to find a match for the first users that will fill in the questions. The application is dependent upon a group of people that have filled in the questions. That is also the

reason that there are two models presented, for the earlier phase the model with fewer questions can be used, when the number of users using the application grows, the number of questions can increase in conjunction.

Future research

An interesting step after this research is to follow the matches that have been made by the app. By doing this, the success is being tested, and the prototype can be improved with new information. New questions will arise: Is there a match that ended up in a long-term friendship because of this matching system? What do people regard as functions that miss when a match comes to nothing, and can the prototype improve with this knowledge? By following the people that matched, the system can become smarter. These are long-term questions that are interesting to investigate.

RESOURCES

Amelia, A. (2018, September 27). K-Means Clustering: From A to Z. Retrieved from https://towardsdatascience.com/k-means-clustering-from-a-to-z-f6242a314e9a

Amnesty. (2019, June 19). What's the difference between a refugee and an asylum seeker? Retrieved from https://www.amnesty.org.au/refugee-and-an-asylum-seeker-difference/

Autoriteit Persoonsgegevens. (2020). Data protection impact assessment (DPIA). Retrieved from https://autoriteitpersoonsgegevens.nl/nl/zelf-doen/data-protection-impact-assessment-dpia

Baker, D. (2012). All the lonely people. The Australia Institute paper no. 9 (ISSN 1836-8948).

Beck, W., van der Maesen, I. and Walker, A. (1997). "The Social Quality of Europe." (The Hague, Kluwer Law, 1997).

Berry, John. (2011). Integration and Multiculturalism: Ways towards Social Solidarity. Papers on Social Representations. 20.

Datanovia. (2018, October 20). Agglomerative Hierarchical Clustering. Retrieved from https://www.datanovia.com/en/lessons/agglomerative-hierarchical-clustering/

de Bruyn, E. H., & Cillessen, A. H. (2008). Leisure activity preferences and perceived popularity in early adolescence. *Journal of Leisure Research*, *40*(3), 442.

Fallon, K. (2018, July 17). Newcomer or refugee? Why the Dutch are sensitive about labels. Retrieved from https://www.aljazeera.com/indepth/features/newcomer-refugee-dutch-sensitive-labels-180716183946603.html

Free personality test. (2020). 16Personalities. https://www.16personalities.com/free-personality-test

Greif, G. (2009). Buddy System: Understanding Male Friendships (1st ed.). Oxford, UK: Oxford University Press.

KIS. (2018, February 7). Succesvolle integratie en aanpassing beginnen bij oprechte emotionele binding. Retrieved from https://www.kis.nl/blog/succesvolle-integratie-en-aanpassing-begint-bij-oprechte-emotionele-binding

Kloosterman, R. (2018). Opvattingen over vluchtelingen in Nederland. Retrieved from https://www.cbs.nl/nl-nl/achtergrond/2018/13/opvattingen-over-vluchtelingen-in-nederland

Maslow, A. H. (1943). A theory of human motivation. Psychological Review, 50(4), 370-96.

McPherson, M. et al. "Birds of a Feather: Homophily in Social Networks." *Review of Sociology* 27 (2001): 415-444.

Ministerie van Algemene Zaken. (2017, October 23). 4.6 Integratie. Retrieved from https://www.rijksoverheid.nl/regering/regeerakkoord-vertrouwen-in-de-toekomst/4.-nederland-in-de-wereld/4.6-integratie

M. Shmueli-Scheuer, H. Roitman, D. Carmel, Y. Mass, and D. Konopnicki. 2010. Extracting user profiles from large scale data. In Proceedings of the 2010 Workshop on Massive Data Analytics on the Cloud (MDAC '10). Association for Computing Machinery, New York, NY, USA, Article 4, 1–6.

Personality Types | 16Personalities. (n.d.). 16Personalities. Retreived from https://www.16personalities.com/personality-types

R. Nayak, M. Zhang and L. Chen, "A Social Matching System for an Online Dating Network: A Preliminary Study," *2010 IEEE International Conference on Data Mining Workshops*, Sydney, NSW, 2010, pp. 352-357

Santos, M. (2020, February 24). Applying Machine Learning to Find Love. Retrieved from https://medium.com/datadriveninvestor/applying-machine-learning-to-find-love-3558dafcc4a1

S.R. Asher, M.S. Weeks. 2014. Loneliness and belongingness in the college years R.J. Coplan, J.C. Bowker (Eds.), The handbook of solitude, Wiley Blackwell, Chichester, UK (2014), pp. 283-301.

Sociaal en Cultureel Planbureau. (2016). Integratie in zicht. Den Haag, The Netherlands: Sociaal en Cultureel Planbureau.

S. Yang, B. Long, A. Smola, N. Sadagopan, Z. Zheng, and H. Zha. (2011). Like like alike: joint friendship and interest propagation in social networks. In Proceedings of the 20th international

conference on World wide web (WWW '11). Association for Computing Machinery, New York, NY, USA, 537–546. DOI:https://doi.org/10.1145/1963405.1963481. 2011.

United Nations High Commissioner for Refugees. (1951). Convention and protocol relating to the status of refugees. Retrieved from https://www.unhcr.org/3b66c2aa10.html

Vigil, Jacob. (2007). Asymmetries in the Friendship Preferences and Social Styles of Men and Women. Human nature (Hawthorne, N.Y.). 18. 143-161. 10.1007/s12110-007-9003-3.

Vluchtelingenwerk Nederland. (2019). Vluchtelingen in getallen 2019. Retrieved from https://www.vluchtelingenwerk.nl/feiten-cijfers/cijfers-over-vluchtelingen-nederland-europa-wereldwijd

VluchtelingenWerk Nederland. (2020). Wat wij doen | VluchtelingenWerk Nederland. Retrieved from https://www.vluchtelingenwerk.nl/wat-wij-doen

Abujarour, Safa'A & Krasnova, Hanna & Hoffmeier, Farina. (2018). ICT as an Enabler: Understanding the Role of Online Communication in the Social Inclusion of Syrian Refugees in Germany. Retrieved from https://www.researchgate.net/publication/326185770_ICT_as_an_Enabler_Understanding_the_Role_of_Online_Communication_in_the_Social_Inclusion_of_Syrian_Refugees_in_Germany