

The relation between migration background and crime from an age, education, and gender perspective.

Abstract

Migration is a subject with many different aspects. The migration and crime relation is one of them. Research has covered this topic for nearly a century and its relation is very complicated. In this study, the relationship between migration and crime will be further analyzed on the influence of age, education, and gender in the Netherlands. A standardization and decomposition analysis will be used with data gathered from the CBS to gain insight into the influence of crime type, age, education, and gender on the crime rate between non-migrants and people with a migration background in the Netherlands. Furthermore, comparative rates are used to overcome the issue of lacking data. This will all be done with care for research ethics, as the topic researched is very sensitive. Findings indicate that compositional differences between non-migrant and migrant populations can explain a proportion between 8.8% and 61.6% of the differences between the crime rates. For both factors age and education, the non-western migration group is most heavily influenced by its composition. Also, differences between the populations on gender are identifiable. Male/female crime ratios are much higher for the non-western migration group. For future research, individual data gathering should be the main aim, as current data is not widely available. Also, more insight into labor, employment, and income characteristics is a useful addition to the existing literature.

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1 Introduction

In most European countries migration, and in particular, non-western refugees spark up debate in media and politics (Siebers & Dennissen, 2015). In the Netherlands, this is no different. Over the last decades, different right-wing politicians voiced their disapproval against the incoming refugees increasing public tension. The most famous example being Pim Fortuyn, the leader of the political party 'Leefbaar Nederland'. He was famous for his extreme stance against migrants, and got shot a few days before the election in 2002 (Engbersen, Van der Leun, & De Boom, 2007). In 2021 the Dutch society is polarized on the topic of migration, especially at the opposite extremes. (Albada, Hansen, & Otten, 2021). The 2021 Dutch election again increased debate about migration policy and legislation. Political parties like the PVV and FVD strongly voicing against it acclaiming that due to increasing migrant numbers, crime rates are substantially higher (Van Klaveren, 2012). Whether there is substance to this claim is debated among the academic literature. The relation between crime and migration has many dimensions and sides that are all connected (Bell & Machin, 2011). Furthermore, researching this relation between crime and migration is a sensitive topic and has to be done with thorough ethical considerations (Düvell, Triandafyllidou, & Vollmer, 2010).

Migration is a subject that is vastly covered by academic research and across multiple disciplines of study (Dingle & Drake, 2007). One of those disciplines is the field of geography which is one of the frontrunners to study this subject. Geographers have a broad-ranging subject matter and varied research methods ideal for covering such a wide concept (King, 2012). Migration not only impacts the place of origin of the migrants in both internal and external migration according to Lipton (1980); Lowell and Findlay (2001) but also the destination country (Ratha, Mohapatra, & Scheja, 2011). Due to the impact of migration, policies are debated upon in national politics framed by the safety and security concerns of its citizens (Ousey & Kubrin, 2018). Research on the existence of this relationship has been conducted for nearly a century with three main questions being researched according to Hagan, Levi, and Dinovitzer (2008). (1) Whether immigrants commit more or less crime than non-migrants. (2) If there exists a difference in the crime rates due to cultural differences between migrants and non-migrants. (3) How the trajectories unfold over time and whether or not the migrant group adapts its crime rates to the non-migrants group.

This research aims to fill the small gap in the existing literature that is identified by Engbersen et al. (2007). Their work on researching the migration crime relation in the Netherlands found difficulties with the limited number of data indicators available for researching integration processes of migrants concerning crime. According to Engbersen et al. (2007), the indicator of educational background is important to research this gap. The influence of the educational level of migrants is also discussed in other research papers like MacDonald, Hipp, and Gill (2013); Machin, Marie, and Vujić (2011); Rumbaut (2008). Engbersen et al. (2007) also identified other socioeconomic factors such as social capital and unemployment as important factors. Also, the factor of age is important for determining the relationship between crime and migration. According to Farrington and Tarling (1985), the age-crime profile is important to research when predicting crime. The inflow of migrants can heavily influence this age-crime profile in the destined country (Ousey & Kubrin, 2018). As well as age, gender can heavily influence crime rates as males are far more prone to commit a crime than females (Broidy & Agnew, 1997). These different factors may also result in different rates among different types of crimes. This research aims to find how much these factors explain the differences in crime rates among non-migrants, western migrants, and non-western migrants in the Netherlands. The main research question of this paper is: *What is the influence of crime type, age, education and, gender on the crime rate between non-migrants and people with a migration background in the Netherlands?* To answer the main research question each of the factors will be analyzed. The sub-research question is structured around each of these factors. The sub-research questions are as follows: (1) How do crime rates differ between migration background and crime type? (2) How do differences in age-composition influence crime rates between migration background types? (3) Does educational level explain differences in crime rates among migration backgrounds? (4) How does gender influence crime rates among people with a different migration background? By answering these sub research questions, a better understanding of the relation between the factors can be gained to answer the main research question.

To answer the sub and main research questions first an extensive literature review will be done. The existing academic literature will be explored for theories explaining the relation between migration and crime with a focus on their relationship with age, education, and gender. Then in the methodology, the quantitative research process will be explained and how this helps substantiate the results found in the literature review. The quantitative method used for this research is the demographic method of

standardization and decomposition also used in Preston, Heuveline, and Guillot (2001). Further elaboration will be given in the methodology. The results of the standardization will first be analyzed separately. Then the results will be compared together with the results found in the literature review. Then in the conclusion, the sub-research questions will be answered, and then finally the main research question will be answered.

2 Theoretical Framework

2.1 Migration and crime

As mentioned in the introduction, research on the relation between migration and crime has existed for centuries. Of the three questions identified by Hagan et al. (2008) that have been leading in the research on this topic, this paper will focus on the first one: whether immigrants commit more or less crime than non-migrants. The answer to this question is still very much up for debate. The work of Ousey and Kubrin (2018) showed that quantitative studies that research this question show various, and sometimes contradicting results. In the immigration-crime nexus, three main theories have been identified by Mears (2001a): (1) social disorganization theory, (2) strain theory, and (3) cultural deviance theory.

The first one, social disorganization theory, is based on the assumption that a community that experiences differences in values amongst residents. These differences lead to the inability to maintain social control amongst the community which increases crime rates (Sampson & Groves, 1989). This is most common in areas with high poverty, ethnic heterogeneity, family disruption, and residential mobility (Mears, 2001a). The second theory, strain theory, focuses more on the individual with the hypothesis someone is more likely to succumb to crime when the individual has few prospects to achieve his social goals (Agnew, 1992). Cultural deviance theory suggests that groups of people become susceptible to adopt criminal behavior through poor living conditions and eventually it becomes normative behavior according to Mears (2001b).

How do these three theories connect to the relationship between crime and migrants and non-migrants? According to Musterd and Deurloo (2002); Ousey and Kubrin (2018) the sheer concentration of migrants with an ethnic different background clustering together prevents participation in society. This is dangerous when these migrants occupy lower positions socioeconomically and thus qualifying for the three theories (Bell & Machin, 2011). So an individual who is less fortunate socioeconomically is more prone to fall into criminality (Buonanno, 2003). This relation is further researched from an economist's point of view. The work of Becker (1968); Ehrlich (1973) developed an economic theory that tries to explain whether crime pays for the economically less fortunate. This is done by the economic concept of utility. Two factors are identified. (1) The earnings from successful crimes should exceed those from legitimate work. (2) The discounted present value of crime, taking account of the risk of arrest and incarceration should exceed the discounted present value of legitimate work Freeman (1999).

Now the leading theories explaining the relationship between crime and migration have been discussed, it is time to look at the migration and crime situation in the Netherlands. Dutch society has been heavily influenced by migration processes over the years (Engbersen et al., 2007). Flows of postcolonial guest workers and processes of family reunification in the 1950s and 1960 lead to an increase in crime rates. Especially an increase in crime rates for second-generation migrants has been identified. Most studies on the relationship between migration and crime have been conducted with a focus on non-western migrants. The work of Junger and Polder (1992) shows that mainly social control factors explain the crime rate differences. Crime rates may thus be the same for indigenous boys if these factors were similar. Bovenkerk and Fokkema (2016) agree with this as they state that socio-economic situation but also a portion is due to their native region. Engbersen et al. (2007) further address the important role that the government has in policy and integration processes among migrants.

2.2 Education

One of the prime socioeconomic indicators is educational level (Duncan, Daly, McDonough, & Williams, 2002; Huang, Van den Brink, & Groot, 2009). Educational level is one of the indicators identified by (Engbersen et al., 2007). Higher education can often lead to higher wages and thus a higher position socioeconomically. This relation should therefore reflect a negative relation between crime and educational level. The study of Machin et al. (2011) identifies three crime education mechanisms that are closely related to the previously mentioned theories. (1) The income effect mentioned above works through education as it reduces the economic benefits of crime. (2) Time spent in the educational system and through achieved diplomas in employment cannot be used to engage in criminal activity. (3) Education can psychologically influence risk aversion and patience processes. Individuals that have gone through the educational system tend to have higher patience and hence value future earnings more and thus reducing the likelihood to fall into crime.

According to Dubin and Goodman (1982), neighborhoods with lower educational levels also see higher crime rates. Studies also find that post-crime correctional education programs significantly increase employment opportunities and hence reduce crime rates (Batiuk, Moke, & Rountree, 1997). The study of Groot and van den Brink (2010) finds that education has specific reducing effects on crimes like shoplifting, destruction, and assault. On the contrary, the probability of committing tax fraud rises with more education. Lochner (2020) agrees with this and states that more time in the educational system reduces the probability of committing most types of crimes. This reduction is attributable to yielding sizable social benefits. This pattern continues in the study of Lochner (2004) stating that street crimes reduce significantly with education. White-collar crimes however showed returns to scale or even an increase in crime rates. Lochner (2004) also emphasizes the strong link between education and employment labeling the two as 'human capital'. This study also states that along with the education-crime the age-crime relationship exists.

2.3 Age

According to Sweeten, Piquero, and Steinberg (2013) the age-crime profile is one of the most prolific correlates of criminal behavior accrediting this to multiple developmental theories. Sociological, psychological, and biological changes to the body and mind during adolescence and adulthood between 15 and 25 years of age play a part in this. To explain this crime-age relationship three main hypotheses exist identified by Gottfredson and Hirschi (1990); Hirschi and Gottfredson (1983): (1) The invariance hypothesis, (2) The non-interactive hypothesis, and (3) The inexplicability hypothesis. The first one the invariance hypothesis is based on the evidence that an age-crime curve exists across multiple tested demographic groups and populations. The non-interactive hypothesis is based on self-control that is seen as a stable trait across age during adolescence and adulthood. This theory tries to explain variations in crime rates per age on an individual level. Then finally the inexplicability hypothesis that claims that the age distribution of crimes cannot be explained by the previously mentioned variables or any variables used in criminology.

Many studies, like the one of Hansen (2003) support the invariance theory and see a short peak in crime rates around 16-25 years. It is noted that different type of crimes see strong vary in where this peak takes place and how strong it rises and declines (D. J. Steffensmeier, Allan, Harer, & Streifel, 1989). Farrington (1986) reports that for some types of crimes the distribution goes unnoticed in the age-crime curve. Take violence for example. Although the highest rates are at the age of 16-25 you can hardly call it a peak. The age-crime curve of violence is almost flat but goes very unnoticed due to its total numbers being lower than for example crimes like theft.

2.4 Gender

Along with age also gender has a huge influence on the probability to commit a crime. In criminology it is accepted that there exists a gender gap in criminality. D. Steffensmeier and Allan (1996) even proclaims that: "women are always and everywhere less likely than men to commit criminal acts" (1996, p. 459). In their study, a pattern is reported on the differences between both genders. Through the years female offense rates are between 15% and 30% on average of the total crimes committed. This number is slowly increasing over time (D. Steffensmeier & Allan, 1996). A large part of the female offense rates is in minor offenses. For serious offenses like Robberies and assault females only have 7% to 12% in comparison to the male population. The most used theory in the gender-crime analysis is the gender equality hypothesis. The hypothesis states that more gender equality will lead to more masculinity and taste for risk in the female population. Therefore a more gender-equal population will see a higher female share of crime (D. Steffensmeier, Allan, & Streifel, 1989). Another theory that can also be applied to understanding the gender-crime relation is the general theory of crime by Gottfredson and Hirschi (1990) which was also applied in the crime-age part. According to Burton Jr, Cullen, Evans, Alarid, and Dunaway (1998), the concept of self-control concerning crime rates applies to the gender and crime relation.

2.5 Hypothesis and conceptual framework

Following the theoretical framework, it is hypothesized that crime rates among migrants in the Netherlands are substantially higher than those of people with a Dutch background. Differences between the migrants and non-migrants can be explained by differences in education and age. Within the groups, differences in rates between the genders can differ but show similar patterns. The three

variables will explain different effects on the type of crime committed. Differences in the type of crime rates will also be different among the different migration background groups. This is visualized in figure 1.

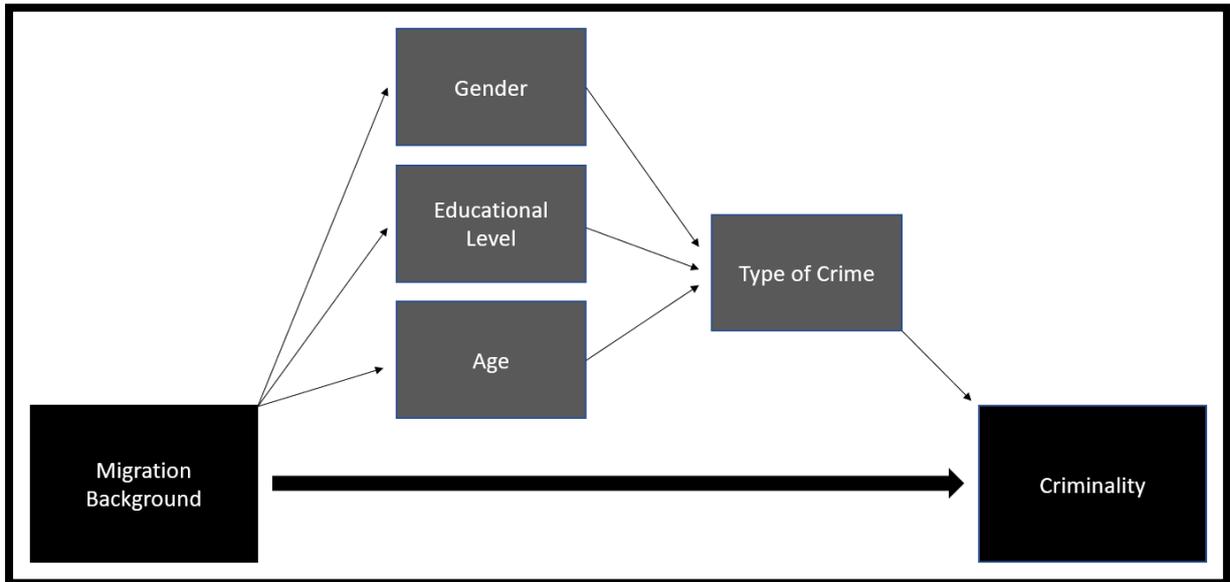


Figure 1, Conceptual Framework

3 Methodology

3.1 Data Collection and Quality

Data is required to analyze how migration background affects criminality. Considering the sensitivity of the subject, especially in combination with migration background, this data is not widely available. In an ideal situation, individual data would be used for statistical analysis with basic regression models. However, there is no public individual data available that can be used to better understand the relationship between crime and migration. The type of data that is available on this subject is aggregate data listed by the CBS of the Netherlands. The numbers are taken from the Basic Registration of Persons (BRP). The data of several datasets of the CBS will be combined for a similar standardization and decomposition analysis as described in the research of Preston et al. (2001). All the datasets are from the annual period of 2019. More specifically, the first quarter. The first dataset CBS (2019a) used for the analysis gives insight into total population numbers from different migration backgrounds also separable by age and gender. The second dataset of the CBS (CBS, 2019c) contains total annual crime rates from the Netherlands, the subject crime rates are reported by the national police in the HKS system. It is important to note that the crime rates are based on suspect rates reported by the national police. This data is separable by crime type, gender, age, and migration background. The final dataset of CBS (CBS, 2019b) used in this research gives insight into the total education number in the Netherlands. The dataset is separable by migration background, Gender, and a variety of educational classifications. The CBS of the Netherlands is an independent research bureau that aims to produce insight into social issues (CBS, 2021). The bureau follows strict regulations set by the government like the statistics Netherlands act, the data Acquisition Decree, as well as the EU GDPR act. This ensures that the data is of high quality and gives an objective view of population characteristics without breaking any privacy restrictions. It also ensures that statistics acquired from CBS can be used in research with minimal data collection bias.

3.2 Standardization and Decomposition data analysis

To analyze the effects crime, age, and gender have on different migration backgrounds a process of direct standardization and decomposition will be used. This technique is used by demographers to eliminate compositional effects from two or more populations (Gupta, 1993). Since it first occurred in Kitagawa (1955) the methods have been developing. For this research the process described in Preston et al. (2001) will be used with slight alterations. Instead of mortality-rates, crime rates will be calculated. In this research, different variables will be used as population distribution. However, for explanation purposes, solely the variable age will be used. The first step in this process is calculating the percentage of each population that is in each age group (C_i). The second step is controlling for differences in age-specific crime rates and probabilities are calculating the age-specific Crime Rates (M_i). To calculate this the following notation is standard:

$$\text{Age Specific Crime Rate } (M_i) = \frac{\text{Number of crimes in the variable range } x \text{ in period } T}{\text{Number of persons living in variable range } x \text{ in period } T}$$

This Age-specific crime rate is calculated for all the different ranges of age and analyzed for all migration backgrounds. The next step in the process is calculating the crude crime rate (CCR). The CCR is determined by two functions. The set of age-specific crime rates (M_i) and the proportionate age distribution (C_i). This is calculated as follows:

$$CCR = \sum M_i \cdot C_i$$

After the CCR is calculated for each of the populations the values need to be standardized. Standardization is eliminating the effect that differences in age composition have on how the population is sorted. To do this the specific crime rates have to be multiplied with the distribution of the population that it is compared with. In the upcoming formulas, the population is indicated by p_1 for population 1 and p_2 for population 2. What population groups 1 and 2 are differ per calculation, but the Dutch population composition will be seen as the standard. The formula to calculate the age-standardized crude crime rate (ASCCR) is as following, using the age-specific crime rates of population 1 ($M_i^{p_1}$) and the proportionate age distribution of population 2 ($C_i^{p_2}$):

$$ASCCR = \sum M_i^{p_1} \cdot C_i^{p_2}$$

After the standardization procedure also, the decomposition will be conducted. According to Preston et al. (2001), the process of decomposition comes down to answering the following question from Kitagawa (1955): “How much of the difference between crime rates in population 1 and 2 is addressed through differences in their age distributions?”. To calculate this, two calculations must be made. The first calculation is to calculate the contribution of the age composition differences between population p1 and p2. It is calculated as following using the same type of values as the previous calculation:

$$\Delta 1 = (C_i^{p1} \cdot C_i^{p2}) - \frac{(M_i^{p1} + M_i^{p2})}{2}$$

The second calculation is to calculate the age-specific crime rate differences. That is done by the calculation below:

$$\Delta 2 = (M_i^{p1} \cdot M_i^{p2}) - \frac{(C_i^{p1} + C_i^{p2})}{2}$$

By doing this calculation the percentage of differences between the populations can be determined for the examined variable in this case age. The percentage in differences between the specific rates will be classified as ‘unexplained’.

This process of standardization and decomposition can’t be done when the specific rates are not available or ‘known’ for the population. In this case, there are no specific rates for crime per educational level for the Netherlands in 2019. Preston et al. (2001) proposes a method to work around this research problem. This method is to calculate the comparative rate and is also used in this research. Instead of using the crime per educational rates for the population, which are unavailable, a standard rate from another population will be used. In this study, this is done for per crime type educational rates ‘borrowed’ from the work of Groot and van den Brink (2010). Even though the rates are from another year, the population researched which is the Netherlands is ideal for this research. To calculate the comparative crime ratio (CMR) the following calculation is used.

$$CMR = \frac{D^{p1}}{\sum N_i^{p1} \cdot M_i^{p2}}$$

In this calculation D^{p1} is the recorded number of crimes at all education groups combined in population p1, N_i^{p1} is the number of persons in education group i in population p1. M_i^{p2} is the crime rate in the i th age interval in population p2.

The last part of the quantitative analysis is focused on gender. This part also uses a different method. Even though a standardization and decomposition analysis is possible as there are no data limitations for it. The process would not add any useful results for the research as male/female compositions in all the populations are similar in a 50/50 divide. Instead of the standardization and decomposition analysis, a comparison will be made between male and female crime ratios for each population.

3.3 Implementation of the data analysis

Now the process of standardization and decomposition that will be used in this research is clear, it is important how it will be specifically implemented to gather results. In this research, the relationship between migration background and crime rates per crime type will be analyzed on its effect with the following variables: age, education, and gender. The first step in this process is to determine the different groups of migration background that will be researched. Vital is that there are suitable datasets available for these groups. For this study people with a Dutch background or non-migration background will be compared with two different types of groups with a migration background. The group with a Dutch or non-migrant background includes people of whom both parents have been born in the Netherlands. The two migrant groups that will be used are the group of western migrants and non-western migrants that have migrated to the Netherlands. Not only is the data of the CBS available for these groups, it is also a good comparison according to the literature. Many studies examining the migration-crime relations in the Netherlands focus on non-western migrants and refugees like the work of Bovenkerk and Fokkema (2016). By comparing a western-migrant and non-western migrant group two culturally widely different groups can be compared. Not only are the cultures of these groups

different, their reasons for migrating are also varying. Non-western migrants most likely include more refugees while the western migrant group is more likely to have migrated for work reasons. Furthermore, the type of crimes that will be researched have to be available in the data gathered. In this research crime rates in theft, destruction, and public order violation, violence, and traffic will be examined for all variables. Drug-related crimes and illegal firearm usage will only be used for the age variable due to data limitations.

To analyze the effect differences in age composition have on crime rates per migration background the standardization and decomposition process described above will be used. First, the ASCCR per 1000 will be calculated and compared between the different populations. This comparison will be done on the different types of crimes to see which crimes are most heavily influenced by differences in age and migration background. Then decomposition will be used to see the percentages that are explained by age and the percentage that is still left 'unexplained. The next variable, education will be analyzed by the comparative method also described above. Instead of using age groups, the populations will be sorted on educational level. The following educational levels are available along with the rates that have to be borrowed from Groot and van den Brink (2010): primary, lower secondary, lower vocational, intermediate vocational, higher secondary, higher vocational, and university level. For each of the migration background groups, the percentage of the population in each educational group will be calculated. The borrowed rates are gathered from a survey. The percentages are probably higher than if these rates would be available similar to the suspect rates reported by the police and CBS. This is because the survey questioned whether applicants 'did' the certain crime and not whether they got caught. With the help of the 'borrowed' rates, the comparative crime ratio will be calculated to see differences a standardized education level between the groups makes. Then, the comparison between the male and female crime rates within each population will be compared. The results of all the different variables will be analyzed and compared with findings in the literature review. Now the effects of age, education, and gender are more clear, combining the results is the final step. Due to the different types of results for each variable as a result of data limitations combining them is a difficult process. The effect of gender can be neglected in this process as there are no substantial differences in gender composition in the Netherlands. The effect of age is calculated in the direct standardization and decomposition analysis. The proportion that can be explained by differences in age composition being more precise than the indirect standardization process. For the effect of education, indirect standardization was used. Decomposition isn't possible due to this so the percentage difference between crude and standardized rate is calculated. Adding these two effects together gives a 'rough' estimation of the combined effect of these two variables.

3.4 Limitations and Ethical Considerations

As mentioned, the limited data available on the relation between migration background and crime is limiting this research. Using methods like the comparative ratio gives useful results but are always less concluding than when the actual rates are available. The data limitations are of course a result of the sensitivity of the topic. In this research ethical considerations are highly regarded with prejudice and bias being minimalized. Regardless of the results of this research will only be seen and shared by an academic audience of peers and assessors.

4 Results

4.1 The influence of age

In the result section the findings will be shown, discussed, and compared with the literature review. The first part of the data analysis shows the results from the standardization and decomposition analysis on the relationship between crime, migration background, and age. The results of this analysis are shown in table 1: Crime-Age ASSCR and Ratio's and Table 2: Crime-Age percentages. Table 1 shows the ASSCR of the different crime types when the Dutch age structure is used as standard. The table also shows the crude ratio and then the corrected age-standardized ratio. Table 2 further shows the proportion of the differences in the crude rates that is attributable to age composition and the part that is still left unexplained.

	All Crime	Theft	Destruction & Public order Violation	Violence	Traffic violations	Drugs related crime	Illegal firearm usage
Dutch ASSCR x1000	6	2	1	2	2	1	0
Western ASSCR x1000	15	7	2	3	4	2	1
Non-Western ASSCR x1000	19	8	3	6	4	2	1
D-W Crude Rate Ratio	2.68	3.79	2.16	1.88	2.30	3.17	2.65
D-W Standardized Rate Ratio	2.40	3.41	1.94	1.68	2.02	2.83	2.41
D-NW Crude Rate Ratio	3.82	5.02	3.76	4.37	2.64	4.82	4.77
D-NW Standardized Rate Ratio	3.08	4.06	2.88	3.53	2.10	3.80	3.59

Table 1, Crime-Age ASSCR and Ratio's

From the results in table 1, a clear pattern is visible. In line with the literature and studies of Engbersen et al. (2007); Junger and Polder (1992) review crime rates are higher among both groups with a migration background in comparison to the group with a Dutch background. The crime rate for all types of crimes per 1000 inhabitants of the Dutch population is 6. For both migrant groups, this is significantly higher with a respective ASSCR of 15 for the Western and 19 for the non-Western group. When standardizing for age this number lowers. The ratio of 2.68 for the western group drops to 2.40 and the ratio of the non-western group falls from 3.82 to 3.08. When further analyzing different types of crimes, the group with a non-western migration background has higher crime rates for all crime types compared to the group with a western migration background. The most common type of crime in all groups is theft, or in other words, capital crime. The least common type of crime is illegal firearm usage. The biggest differences in ratios between migrant backgrounds and Dutch backgrounds are theft and drug-related offenses. Between the Dutch and migrants groups, drug-related offenses have a 3.17 and 4.82 ratio before standardizing. After standardizing this falls to 2.83 and 3.80. For theft this is 3.79 and 5.02 before and 3.41 and 4.06 after. The least difference between both migrant groups and the Dutch background group is in traffic offenses with the ratio between migrants and non-migrants after standardizing being 2.02 and 2.10.

In table 2 the effect of age is shown for the different types of crime. Differences in age composition for both migrant groups can explain a portion of the differences in crime rates in comparison with the Dutch group. The percentages range between 8% and 24%. The much younger migrant population especially for the non-western group has a higher proportion of the population in the age-crime profile group, as identified by Hansen (2003). Similar to these ratio's, the proportion that can be explained by age is higher for the non-western group than the western group. Only for violence, age composition explains similar proportions between the western and the non-western migrant group with 16%. In the literature review, violence was identified as having the least relation with the age crime curve (Farrington, 1986).

Differences in theft rates are least influenced by age composition and traffic violations the highest. The results of standardization and decomposition analysis have shown that age explains a part of the differences in crime rates between migrants and non-migrants, but still, a large proportion between 76% to 90% is left unexplained.

	All Crime	Theft	Destruction & Public order Violation	Violence	Traffic violations	Drugs related crime	Illegal firearm usage
D-W Proportion attributable to age composition	11%	8%	13%	16%	15%	11%	10%
D-W Proportion still 'unexplained'	89%	92%	87%	84%	85%	89%	90%
D-NW Proportion attributable to age composition	17%	15%	21%	16%	24%	17%	20%
D-NW Proportion still 'unexplained'	83%	85%	79%	84%	76%	83%	80%

Table 2, Crime-Age Percentages

	All Crime	Theft	Destruction & Public Order Violation	Violence	Traffic violations
D-W Crude Crime Rate	2.68	3.79	2.16	1.88	2.30
D-W Comparative Crime Ratio	2.69	3.76	2.19	1.93	2.22
Percentage difference	0.4%	-0.8%	2.2%	2.8%	-3.4%
D-NW Crude Crime Rate	3.82	5.02	3.76	4.37	2.64
D-NW Comparative Crime Ratio	3.03	4.26	2.22	2.82	2.76
Percentage difference	-20,7%	-15.1%	-40.1%	-35.4%	4.4%

Table 3, Crime-Education Rate's/Ratio's

4.2 The influence of education

The second part of the data analysis is analyzing the relationship between crime, migration background, and education. In Table 3: Crime-Education Rate's/Ratio's, the results of the indirect standardization process are shown, depicting the comparative educational crime ratios. Also, the percentage differences between the crude ratio and the comparative ratio are shown. According to the literature, a population with a higher educational level should have lower crime rates (Engbersen et al., 2007; Lochner, 2004). Both the population with a Dutch background and the western migration background have a similar higher education level than the group with a non-migration background. For the results in table 3 education shows a differing effect when compared to age. For the western migration group differences between the Dutch group are minimal, caused by the mentioned minimal differences in educational level. Differences range from -3,4% to 2,8% due to correction in educational composition. The

differences between the non-western group and the Dutch group are far larger. The ratios are modified between -40,1% and 4,4% after being corrected for educational composition. Only traffic violations have an increased ratio when corrected for age composition. violence and destruction & public order Violation show huge differences in crude and comparative ratio with -35,4% and -40,1% after the correction. That violence and destruction & public order violations are highly influenced by educational level is predicted by Groot and van den Brink (2010). the study from which the per education level crime rates used in this research are taken from. The rates align with the total crimes reported.

4.3 The influence of gender

The third part of the data analysis covers the relation between crime, migration background, and gender. As mentioned, a slightly different analysis is conducted as male/female compositions in the populations are similar. The results are shown in table 4: Crime-Gender Ratio's/Percentages. The table covers the different male/female crime ratios of the different groups. Also, the percentage difference in male/female crime rates for the migrant groups is shown in comparison to the Dutch group. Crime rates are higher for males than females for all different crime types, as predicted by the literature (D. Steffensmeier & Allan, 1996). The male/female ratio, for all groups is the lowest in theft crimes and the highest for illegal firearm usage. In migration groups, the male/female ratio is higher in comparison to the Dutch group. Between both migration groups, the percentage differences are varying widely but for all crimes, the western migrant ratio is lower. In the literature review the gender equality hypothesis is discussed (D. Steffensmeier & Allan, 1996). The higher male/female ratio of the non-western migrant group could be explained by this hypothesis. Gender equality for non-western migrants is generally lower in their country of origin, compared to, for example, non-migrants in the Netherlands and the group of western migrants.

The effect of migration background and crime rates in the Netherlands can partly be explained by differences in population characteristics. Age and education differences within the migrant groups make migrant populations more probable to commit crimes. Even though gender distributions are similar between the group's differences in crime rates in the male and female ratios are very different.

	All Crime	Theft	Destruction & Public order Violation	Violence	Traffic violations	Drugs related crime	Illegal firearm usage
Dutch Male/Female Ratio	3.88	2.22	6.10	6.00	5.24	6.08	10.35
Western Dutch Male/Female Ratio	4.84	3.42	6.51	7.30	8.44	6.01	14.8
Western percentage more from Dutch Ratio	24.7%	54.1%	6.7%	21.7%	61.1%	-2.2%	43.0%
Non-Western Male/Female Ratio	5.67	3.93	8.40	7.52	10.23	13.57	18.57
Non-western percentage more from Dutch Ratio	46.1%	77.0%	37.7%	25.3%	95.2%	123.2%	79.4%

Table 4, Crime-Gender Ratio's/Percentages

4.4 Cumulative effect

To combined effects of age and gender are shown in table 5: Combined effect for western migrants, and table 6: Combined effect for Non-Western Migrants. As mentioned in the methodology the cumulative percentage combines the proportion explained by age and education. Changes in composition explain a larger part for non-western migrants with 37.7% for western migrants this is 10.6%. For the non-migrant group, two types of crime have more than half of the percentage explained. This is for violence

with 51.6% and destruction and public order violation with 61.1%. The percentage still unexplained is large between 91.2% and 38.9%. Which sparks the question: what variables and effects can explain this? Are these effects measurable by number or are they more reliant on qualitative research for clarification?

	All Crime	Theft	Destruction & Public order Violation	Violence	Traffic violations	Drugs related crime	Illegal firearm usage
Proportion of differences explained by age differences	11%	8%	13%	16%	15%	11%	10%
Percentage difference Education	-0.4%	0.8%	-2.2%	-2.8%	3.4%	-	-
Cumulative 'Percentage'	10,6%	8.8%	10.8%	13.2%	18.4%	-	-
Percentage still 'unexplained'	89.4%	91.2%	89.2%	86.8%	81.6%	-	-

Table 5, Combined effect for Western Migrants

	All Crime	Theft	Destruction & Public order Violation	Violence	Traffic violations	Drugs related crime	Illegal firearm usage
Proportion of differences explained by age differences	17%	15%	21%	16%	24%	17%	20%
Percentage difference Education	20,7%	15.1%	40.1%	35.4%	-4.4%	-	-
Cumulative 'Percentage'	37.7%	30.1%	61.1%	51.4%	19.6%	-	-
Percentage still 'unexplained'	62,3%	69.9%	38.9%	48.6%	80.4%	-	-

4.5 Future recommendations

For future research, it is beneficial to overcome the challenges this research had to cope with. Overcoming the lack of data would give researchers more options to see the influence migration has on crime. When using a similar approach as this research with a standardization and decomposition analysis it is useful to have more data on specific rates for education. Using standard rates of a different population is less precise than using the actual rates. Also, aggregate data could bring much more information if it were possible to cross-classify for all the different variables. In this research the total contribution of the variables is roughly estimated but can't be calculated in a precise manner. Hence the usage of individual data would be ideal to research this subject. To get this additional data new data collection is needed. Therefore, it is recommended to distribute surveys in targeted populations for example prison populations to gain insight into this. Furthermore, the characteristics of employment, income, and labor are interesting to further research.

5 Conclusion

In this research, the relationship between migration and crime is examined with a focus on age, education, and gender. This is done by reviewing the existing literature, using standardization, and decomposition to analyze data. In the Netherlands crime rates among migrants are higher than amongst the non-migrant population.

One of the most important identifiers of the probability of someone committing a crime is the age-crime curve. 'younger' people are more likely to commit a crime according to invariance and non-interactive hypothesis. In the Netherlands, the average migrant population is younger than the non-migrant population, which explains between 11% and 17% of the crime rate differences on average. Traffic, destruction, and public order violations are most influenced by age. For theft and drug-related offenses, this is the lowest. The influence of education on the probability to commit a crime is also established by the literature. Theories in criminology, like the strain theory, proclaim that lower chances to achieve goals increase the probability to commit crime. This states that, according to the income effect mechanism, a less educated population would be less 'able' to achieve its goals. In the Netherlands, non-western migrants have a lower educational level than the western migrants and non-migrants which have a similar composition. The data analysis, using comparative rates, supports the literature. For all types of crimes, there is between -0.04% and 20,7% difference that is proven to be caused by differences in educational composition on average. The influence of education level is for a large part determined by the type of crime. For violence and public order and destruction, the percentage amounts up to 35 to 40%. While for traffic violations this is much lower and an reversed effect can be identified. In contrast to age and education differences in composition on gender are almost nonexistent. However, within the groups, the male/female offense rates do differ, however. For the non-migrant population, the male/female offense ratio is 3,88 while for the western, and non-western migrant populations the ratio is 25% to 46% higher on average. That males are more likely to commit a crime is an undeniable fact in the literature. Differences in the male/female ratio are to be explained by the gender equality hypothesis. Additionally, the gender equality hypothesis can also be used for explaining differences between non-migration and groups with a migration background, since gender equality is often lower in the regions of origin.

In conclusion, the relation between migration and crime is influenced by factors such as age, education, and crime. Often differences in population composition (age and education) are partly of the reason behind these differences in crime rates. However, factors that cannot be explained by compositional differences, like gender differences, do occur. Combining the effect of the different variables is difficult and only gives a rough estimation. The standardization effect of age and education explain between 8.8% and 61.6% of the differences in crime rates. Results differ by type of crime. For future research acquiring data, preferably individual data should be the main aim. When further researching this topic with aggregated data a solution for combining the variables more precisely can be beneficial. With the data gathering process, new characteristics like employment, income, and labor should be added to future research.

6 Bibliography

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