

Capturing the Young and the Restless

A quantitative study on how Rotterdam can attract and retain the young and highly educated population



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Foreword

During the master program, Urban, Port and Transport Economics, the class visited multiple urban projects in Rotterdam at which we were hosted by the OBR (The Development Company of Rotterdam). Continually, they would ask us what we thought of the city, and what could be improved. It appeared to me as if the municipality did not have a clear view on how their city was perceived by the student population even though they have been very active in promoting the city as a student city. To me, this presented an interesting case. In combination with the popular views of Richard Florida and Edward Glaeser, that people are the engines behind urban economic growth, the case of Rotterdam and their aim to attract the young and highly educated population really appealed to me.

This research concludes the great decision to study in Rotterdam for my master program. When I was finishing my bachelor at the University College of Utrecht, my interest for applied economics made me attend the open day at the Erasmus School of Economics. There was Erik Braun, currently my thesis supervisor, presenting the Urban, Port and Transport economics program. But instead of talking about the content of the master, he posed questions, questions that triggered my interest for social economic issues. And soon enough, I found myself studying in Rotterdam. During the course of the year I discovered as much about the field of urban economics as I did about myself. Inspiring lectures, great material, and a fantastic group made it a memorable year. Finally, a trip to Venice with the class topped it all.

This research represents the end of an era. In my five years of student life, I have had the privilege to spend two semester abroad, meeting great people from around the world and discover about my personal interests. With that, I would like to thank my supervisor Erik Braun, for inspiring me, getting me to Rotterdam, and guiding me through this process. And thanks to my friends and family for shaping me to who I am.

Max Meijer

Utrecht, August 2010

Summary

Highly educated people are endowed with a high level of human capital which is found to be the main driver for urban economic growth. In addition, as moving probabilities decrease for the individuals after the age of around 25, the highly educated people are most easily attracted around that age, and the probability of losing them as a city, decreases with time. Hence, cities should attract young and highly educated to stimulate their economy. However, Rotterdam has the lowest share of highly educated people among the four largest Dutch cities. In addition, Rotterdam fails to attract the young population when other cities succeed. With 60.000 students enrolled in higher education institutions in Rotterdam, the city has access to a large source of young and highly educated people. Therefore, this research aims to analyze how Rotterdam can attract and retain the young and highly educated population. More specifically, it aims to analyze how perceptions, preferences and personal characteristics effect the overall judgment on Rotterdam. A questionnaire was designed and distributed during different lectures. This resulted in a sample consisting of 580 respondents.

The statistical analyses yielded three main results. First, the student population is highly diverse, and four groups can be distinguished based on their preference for urban environments and their overall opinion of Rotterdam. Second, the more experience a respondent has with Rotterdam, the more positive the student is about the city. This result is very comforting for the municipal office as it implies that once the student has been attracted, the probability of retaining them increases with time. Third, the intangible aspects of Rotterdam, such as coziness and openness, appear to have a strong effect on the overall opinion of the city.

Based on these results, three main policy recommendations for the policy makers in Rotterdam can be formulated. First, policy makers should acknowledge that the student population is diverse and specify the marketing efforts to each group. In addition, not every group can easily be won, therefore the city should concentrate their efforts. Second, policy makers should not abolish current student initiative such as Student City or RotterdamLife, but rather expand. A more integrated approach with the private sector, student associations and housing corporations should be presented at a central location on campus Woudestein. Lastly, change the city marketing approach to enhance the image of a cozy and open city.

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1. Introduction

1.1. Background

During the last decades, urban economic research has increasingly focused on the question ‘who?’. Within the field and among policy makers, there exists a consensus that ‘who?’ plays an important role in determining the strength of the local economy. Traditionally, the question of ‘who?’ was not considered as important as today. It was generally accepted that people follow jobs, and thus the question for local policy makers became: which? Which firms would create jobs and stimulate the economy? Nowadays, policy makers seem convinced that people “*do not slavishly follow jobs to places*”, as Richard Florida (2002, p.223) put it. Realizing the importance of ‘who?’ for the economy of the city, researchers and policy makers thus turn to the question of ‘what?’; ‘What attracts who?’.

This research will argue why the answer to the question of ‘who?’ is the young and highly educated population. This however, is hardly groundbreaking news. The importance of the young and highly educated population for the local economy has been recognized in economic literature and among policy makers, also in Rotterdam. Recent initiatives such as Rotterdam Student City and RotterdamLife, were designed to attract more young and highly educated people to the city of Rotterdam. Hence, it appears that Rotterdam has a clear target concerning ‘who?’. The next question therefore becomes: ‘what?’. This however, appears much less obvious. Not only is there little research conducted on the attraction factors of cities for the young and highly educated population, but also policy makers of Rotterdam have not investigated quantitatively what attracts or repels students.

Former alderman Harbers of Rotterdam stated in an article that: “The general consensus is that the city is only fun once you get to know it better” (Marchal, 2009, p. 14). But with an estimated 60% of the student population residing outside of Rotterdam, experiences with the city are minimal (Marchal, 2009, p. 14). The article argues that the majority of the students who travel to the campus Woudestein, are not exposed to attractive locations, thus have few incentives to move into the city. That is why, under the Student City program, several initiatives were launched to stimulate students to experience the city. But how students perceive the city, and which items are important to them, are questions that remain unanswered. This knowledge however, could help shape local policy, increase its effectiveness, and in turn can be used a tool to stimulate the local economy.

1.2. Problem statement

“Rotterdam has to become as student city”, was the headline of an article in the Erasmus Magazine, published in March of 2009. Considering that the Rotterdam has the third largest student population among Dutch cities, with 60.000 students, this heading may appear inappropriate at first glance as it implies that until thus far, Rotterdam has not been a student city. However, a closer look at local policies indeed confirm that the city of Rotterdam has a strong desire to become a student city. With reason, as also Rotterdam realizes that among the four largest cities in the Netherlands, Rotterdam scores lowest in share of highly educated population (OBR, 2010). In addition, as we will see in chapter 3, compared to the other cities, Rotterdam fails to attract people of the age group 25-30. In Amsterdam, The Hague and Utrecht, more people between the age of 25 and 30 years move into those cities than move out, but for Rotterdam, these numbers almost even out. Lastly, on an annual basis, more highly educated migrate outward than inward. These numbers suggest that Rotterdam fails to attract and retain the young and highly educated population. To stimulate the local economy, the share of highly educated people in the city should increase by capturing the young and highly educated population. Therefore, it is useful to investigate what attracts this population to the city, and how they perceive different aspects of the city.

1.3. Research questions

This research aims to add to the existing base of literature on attraction factors of cities for a specific population. In particular it attempts to analyze how the students of Rotterdam perceive the city and which factors are important in their overall opinion on the city and their potential location decision. Most importantly, this paper intends to present how the young and highly educated can be attracted to the city of Rotterdam. Therefore, the main research question in this study is:

RQ: How can Rotterdam attract and retain the young and highly educated population?

In order to answer this question several sub-questions will be addressed.

- R1: From an economic perspective, why is it important to attract the young and highly educated population?
- R2: How do students perceive Rotterdam as a city?
- R3: Which preferences and factors influence the perception of the students of Rotterdam?
- R4: Which preferences and factors influence the preferences of students for places to live and work, after graduation?

1.4. Outline

The paper will start off by addressing the first sub-question why it is important to attract the young and highly educated population. This will be done by literature research, which is presented in chapter 2. Following, a short analysis of the population in Rotterdam and the migration towards and from the city is discussed in chapter 3. In chapter 4, the research methodology is described in which there is an extensive discussion on development of the questionnaire. The results of the statistical analyses are presented in chapter 5. Afterwards, there is a discussion on the limitations, results and implications of this study in chapter 6. The concluding section of this research is captured by chapter 7.

2. Literature Research

2.1. Introduction

Recently, the Dutch researcher Gerard Marlet published a book named “De Aantrekkelijke Stad” (The Attractive City). Herein, the author analyses why some Dutch cities perform better in attracting human capital than others. His ideas are in the footsteps of Jane Jacobs, who published her most influential pieces in 1960’s. Jacob’s work has been called a ‘pioneering piece of social science’ (Glaeser, 2000). In her view, it is the interaction between people that create new ideas, and naturally, the interaction between people is higher in denser areas: cities. A more recent influential scholar in the field of urban economics is Richard Florida. His view on ‘the creative class’ (Florida, 2002) as stimulator of the local economy has been widely embraced by policy makers. Although the ideas of the creative class may be new, hip and sexy, we should not discount the traditional theories on urban economics immediately. Therefore, before we dive into modern creative class theories, we will start off by discussing the classic agglomeration theories.

This chapter aims to answer the question: why is it important to attract the young and highly educated population? What does the literature suggests on attracting and retaining them? It attempts to do so by first analyzing the classic agglomeration advantages of a city while observing that cities are increasingly viewed as a centre of consumption, rather than production. Second, it addresses the importance of human capital for economic growth, followed by theories on how to attract human capital. Subsequently, it attempts to answer who specifically a city should target to acquire the human capital. Lastly, it discusses the importance on attracting young highly educated people. The chapter intends to emphasize the importance of young highly educated for a city by showing that human capital is the main economic driver of economic growth, that the population endowed with a high level of human capital is attracted to amenity rich cities, and that population is most likely to be captured around the age of 25.

2.2. Agglomeration advantages

During the Industrial Revolution, economists sought the explain why firms and factories would locate on very specific sites, for example near mines, rivers and/or harbors. Classical location theories would suggest that the firms based their location decision on the costs of resources and transportation. However, as Marlet (2009) also points out, although these factors can explain the emergences of cities and economic centers, they cannot account for differences in recent growth between cities. In order to understand why some cities attract more firms and people than other, one must look at different advantages that can be gained from clustering.

The geographic clustering of firms and people can create productivity gains, which is called agglomeration economies. Alfred Marshall (1890) introduced three different kinds of benefits that companies can acquire from clustering together, these are often referred to as the *Marshallian externalities*. Marshall recognized that businesses benefit from clustering together as they have access to more suppliers which drives down the price of input (*input sharing*). In addition, in cities

there is a larger pool of potential employees to choose from, which increases the productivity of the firm (*labor pooling*). But perhaps most importantly, Marshall believed that in cities ‘there is something in the air’ that enhances the exchange of ideas and technology between firms and thereby increasing productivity (*knowledge spillovers*). The importance of knowledge spillovers will be discussed more extensively later in the next section.

Traditionally, there have been two prevailing theories on in which situations these advantages can be acquired most greatly; specialization versus diversification. The former implies that the *Marshallian externalities* most occur when firms are located near firms from similar industries. These are named the *Marshall-Arrow-Romer (MAR) externalities*, or *localization externalities*. The existence of the *MAR externalities* has empirically been proven by for instance Henderson (2003), but can also be witnessed by analyzing Silicon Valley, Hollywood or (although currently not the best example) the automotive industry of Detroit. On the other hand, one can argue that the advantages are largest in cities with a diverse industry structure, these are referred to as *Jacobs externalities* or *urbanization externalities*. The latter emphasizes the advantages that can be gained from a large diversified urban structure such as diverse labor skills, 24/7 available labor, developed infrastructures and different kinds of public and private services (Mathur, 1999). Empirical evidence on urbanization externalities can be found in for example Glaeser (1998) and Duranton & Puga (2001). From which type of externalities a company mostly benefits can depend on the type of industry (Henderson, 2003) and the stage of the product life cycle (Duranton & Puga, 2001). Another agglomeration effect is the so-called *home-market effect*, first formally introduced by Paul Krugman (1991). The larger the city and its direct environment, the larger the potential market for products. As such, it becomes more attractive for companies to locate in the city and export to other markets (Marlet, 2009).

Until thus far, the agglomeration effects have been argued from a production standpoint. Recently, the consumer perspective has received increasingly more attention, as the some of the classic *Marshallian* factors and the *home-market effect* also yield benefits to consumers, workers and households. The opportunity to draw from a large labor pool is beneficial for firms, but on the other hand, the ability to choose from many potential employers can be beneficial for a worker. Furthermore, the *spillovers of knowledge* not only benefit firms, but also individuals as it provides the opportunity to increase one’s human capital, resulting in a larger productivity and a higher wage. The *home-market effect* also implies that there is a wide range of products and services for the consumers to choose from. This view corresponds with the theories of Edward Glaeser who argues that the success of a city is increasingly more dependent on the ability to function as a consumption centre as it is people who drive the economy (Glaeser, Kolko & Saiz, 2001). These three factors contribute to the understanding why it is advantageous for people to move towards the city, but these effects will be discussed more in depth in the subsequent sections.

This section aimed to show a shift on the view of a city from a production centre to a consumption centre. The latter has become more popular recently, also because of the contributions of Richard Florida, who’s theories have been widely discussed among scholars and local policy makers. But before the paper can discuss in depth on how to attract people, it will first turn to the importance of their main asset: human capital.

2.3. Human capital

As we have seen above, there are different reasons for firms and individuals to agglomerate in a city. Recent urban economic literature however, suggests that next to the importance of attracting people it is even more important to focus on the question: “who?”. Who should cities target to attract stimulate their economy? To introduce this discussion, the macro economic importance of human capital will be addressed before the discussion will focus on human capital for a city.

In the 18th century, Adam Smith (1776) already recognized the importance of human capital as a resource in production. Workers who possessed more skills and more experience, were equipped with a higher level of human capital and were found to be more productive than the ones who lacked such. In the 1960's, both Theodore Schultz and Gary Becker published influential pieces on the role of human capital. Whereas Becker (1964) emphasized the personal returns on investment in human capital for workers, Schultz (1961) aimed to explain economic growth in economies after the Second World War and suggested that human capital was a main economic driver in the fast post-war economic development. Taking a short side-step here, Jane Jacobs (1969), an influential scholar, stressed the importance of social diversity and social networks for the exchange of ideas, or knowledge spillovers. Although knowledge spillovers were earlier identified as an effect of agglomeration by Marshall (1890), Jacobs' vision focused more on the individual's perspective rather than the firm's perspective. Jacobs (1969) argues that cities form a medium for the exchange of ideas in which people inspire each other and thereby increasing their human capital. Returning to growth theory, Jacobs' notion can also be found in the endogenous growth model of Robert Lucas (1988). For the first time, human capital enters a growth model as having both internal as external productivity effects as an individual's human capital does not only affects his or her own productivity, but also increases the productivity of surrounding workers (Mathur, 1999). In this endogenous growth model, human capital is no longer assumed to have diminishing returns to scale, but rather having increasing returns to scale. This was also picked up by Paul Romer (1990). In the Romer model, the growth of knowledge not only depends on the human capital but also on the stock of knowledge. As an example, the technology used for the mobile phone has depended on the scientific contributions of Hertz and Marconi in the field of wireless telegraphy. In fact, Romer argues that productivity of human capital increases the higher the current stock of knowledge.

From the above, we may conclude that human capital can be a driver for economic growth. But can it also explain growth on a regional or city level? In the past two decades, Edward Glaeser has performed research on why certain cities grow faster than others. In multiple pieces he finds a positive relationship between population and productivity growth and human capital at the city and metropolitan level (in: Glaeser et al, 2001, Glaeser & Saiz, 2003 and Glaeser, Scheinkman & Schleifer, 1995). However, in *Rise of the Skilled City* (Glaeser & Saiz, 2003) he finds that skill composition, next to climate, is the most powerful predictor for urban growth. But what mechanism lies at the root of this positive relation? Marlet (2009) suggest that there are four channels through which human capital stimulates the local economy.

Highly educated people are more productive

Remembering the principles of Adam Smith (1776), higher human capital leads to higher productivity. Human capital can be acquired through education, training, or experience, and indeed, it has been found in micro-studies that a higher education level corresponds with an increase in productivity even in different sectors (Black & Lynch, 1996). Marthur (1999) argues that the most important way in which human capital affects economic growth is through technological progress. Not every innovation is as groundbreaking as the light bulb, but applying existing technology for new purposes or process innovations also contribute to the economic development. Marlet (2009) rightly points out that not every innovation has to be of technological nature, as the majority of innovations in the service sector have very little to do with technology.

The spillover effects of knowledge also greatly contribute to economic growth. As Lucas (1988) labeled human capital accumulation a “social activity” (Lucas, 1988: p.19). This relates back to the increasing returns to scale of human capital. Indeed it has been shown by Rauch (1993) that an additional year of education above the average level has both individual returns as social returns. Especially the social effects are expected to be higher in a denser economy, like the one of a city, as more interaction and exchanges between people take place (Mathur,1999).

Highly educated people are more likely to start-up their own business with more success

Classic economic theories (Schultz, 1961; Becker, 1964) suggest that higher human capital leads to higher success rate of entrepreneurship as individuals endowed with a higher level of human capital are better in recognizing market opportunities and when engaged in business they are more likely to identify growth opportunities (Davidsson & Honig, 2003). However, a glance at the literature weakens this statement. The proclaimed positive relation between human capital and entrepreneurial success is highly debated. There are studies that confirm this statement and studies that disprove it. Confirmation can be found for example in Bates (1990), Storey (1994), Van Praag (1996) and Bosma, van Praag & de Wit (2000). But Van Beest, Klomp, & Van Uxem, (1997) Schutjens & Wever, (2000) and Davidsson & Honig (2003) cannot find such relation. Briefly reviewing the concerning literature, it appears that human capital can be a factor in the success of the entrepreneurship but is far from often a determinant factor. Institutional, cultural, psychological and financial factors also appear to play a role.

Concerning whether highly educated people are more likely to start up their own business, the empirics show different results for different countries. For the U.S. Blanchflower (2004) finds that education level correlations with the probability of being self-employed. However, for Europe the author finds opposite results. In addition, Blanchflower (2004) finds that other demographic factors such as age and gender also have an effect on the rate of self-employment in countries. Other literature (such as Van Stel, Storey, & Thurik, 2006) focuses on the influence of regulation, income and administrative institutions to explain different levels of entrepreneurship across countries; a field that is beyond the scope of this study. This discussion on entrepreneurship aims to show that human capital is merely a small factor in a much larger scheme and it certainly does not guarantee entrepreneurial success.

Highly educated people are better equipped to adapt to changing economic environment

In Glaeser's *Reinventing Boston* (2005), he argues that Boston has survived the many structural economic changes because the population of Boston was equipped with a high level of human capital. Moreover, a skilled city appears more capable of surviving economic shocks, and still come out on top. For example, in the Western economies before the second World War, cities thrived on large manufacturing industries. But the decline in transport costs meant that manufacturing became more footloose, and the cities that continued to fare well were the cities that made a shift to other industries, such as the service industry (Glaeser et al., 2001). A city that has failed to do so is for example Detroit, which recently was hit by the crisis in the automotive industry and appears to be in severe problems. Glaeser et al. (2001) show that the cities with a higher level of education were faster in realizing such a shift than manufacturing areas with less human capital. Marlet (2009) shows similar results for Dutch cities (Marlet, 2009, p. 157).

Highly educated people spend more and thus stimulate the lower level industries

This theory is based on the *trickle-down effect*, as discussed in Aghion & Bolton (1997). They suggest that as highly educated people on average earn more income, they also spend more. They spend their income in inner-city shops, café's, theaters museums etc., which in turn stimulates the employment rate of lower educated people, thus contributing to the economy as a whole. Although the relationship between high-earners and employment rate for the lower educated people has been shown for American cities, Marlet & Woerkens (2004) cannot find such a relationship for Dutch cities.

In sum, human capital drives the economy of a city. The four mechanisms through which human capital stimulates the local economy, as suggested by Marlet (2009) are not uncontested. Nonetheless, the fact that human capital supports the local economy and can explain differences across cities, implies that from a policy perspective human capital is desirable and therefore should be attracted. As human capital is a vital ingredient for urban economic growth, the question then remains, how can a city attract human capital?

2.4. Attracting human capital

For policy makers, knowing that human capital contributes to economic growth is merely a first step. A second step is to realize that human capital can be attracted. Research has shown that people with a higher education are more likely to move between different regions than lower educated people (Cortright & Coletta, 2005). In other words, highly educated people are more mobile. This notion creates competition between cities, as human capital can be won or lost. Indeed cities are increasingly competing for customers, among which the highly educated (Braun, 2008). When attracting people is the priority at hand, the view on the city has to change from being a center of production, to being a center of consumption. What do people consume in cities, and what attracts people to cities? During the last decade, several scholars have attempted to find out what attracts people to the city. But before we can address this issue, a measure for demand must be identified.

The demand for cities in the Netherlands cannot be represented by merely population growth. This is because of the restricted building policy in the Netherlands, as Marlet (2009) points out. Population growth in the Netherlands therefore is more related to city planning than with economic performance. Unlike in the U.S., land is scarce, and therefore cities cannot freely expand. In the basic model of supply and demand, the question thus becomes: what happens when demand increases but supply is totally inelastic? Indeed, price increases. Therefore, Marlet (2009) uses the average housing prices per square meter, controlling for different types of accommodation as a proxy for demand for location. Furthermore, as the price of housing increases, it is likely that the housing will be occupied by higher educated people, as they, with a generally higher income, are the one who are able to afford the higher priced accommodation. Therefore, it is reasonable to assume that the a rise in average housing prices correlates with a rise in human capital.

In the Netherlands, housing prices differ substantially. The average price per square meter in Amsterdam estimated at almost €3000, compared to €1250 in Heerlen (Marlet, 2009: p.40). Why people are willing to pay more for their accommodation in Amsterdam than in Heerlen, has to do with two components according to Glaeser et al. (2001). They argue that the price people are willing to pay for their accommodation consists of the Urban Productivity Premium and Urban Amenity Premium as outlined in the equation below.

$$\text{Urban Productivity Premium} + \text{Urban Amenity Premium} = \text{Urban Rent Premium} \quad (1)$$

The equation suggests that the people are willing to pay more to live in cities as they assume to be more productive in cities and earn higher wages and because they are willing to pay for the supply of amenities that the city can offer. First we turn to the Urban Productivity Premium.

Urban Productivity

As we have seen in the theoretical shift from production to consumption perspectives, the flip-side of the *labor pooling* argument for consumers is the *large supply of jobs* to choose from. Combine that argument with the notion of Lucas (1988) which states that human capital has increasing returns to scale, and together it can imply that people in cities find not only better jobs, but earn higher wages as their human capital increases. The latter effect has been confirmed by Shapiro (2003) who finds that people are attracted to high human capital cities because it increases their production, and in turn results in higher wages. For workers in American metropolitan areas, average wages are 30% higher than the non-metropolitan colleagues (BTA Economic Research Institute, 1994). This corresponds with the view of Jacobs and Lucas that knowledge spillovers have both internal as external effects. However, for the Netherlands, Marlet (2009) argues that the nominal wages do not differ significantly across cities. Wages in the Randstad are on average only 2.9% higher than in the rest of the country (Groot, Smit, & de Groot, 2009). Thus moving to a city for a higher productivity resulting in a higher wage is not likely to accommodate for the location decisions made by households in the Netherlands. As a possible explanation for the lack of difference in nominal wages is that the distances in the Netherlands are much smaller compared to the United States, as for instance one can live in Utrecht but work in Amsterdam. Another explanation for the lack of differences in wages concerns the collective bargaining

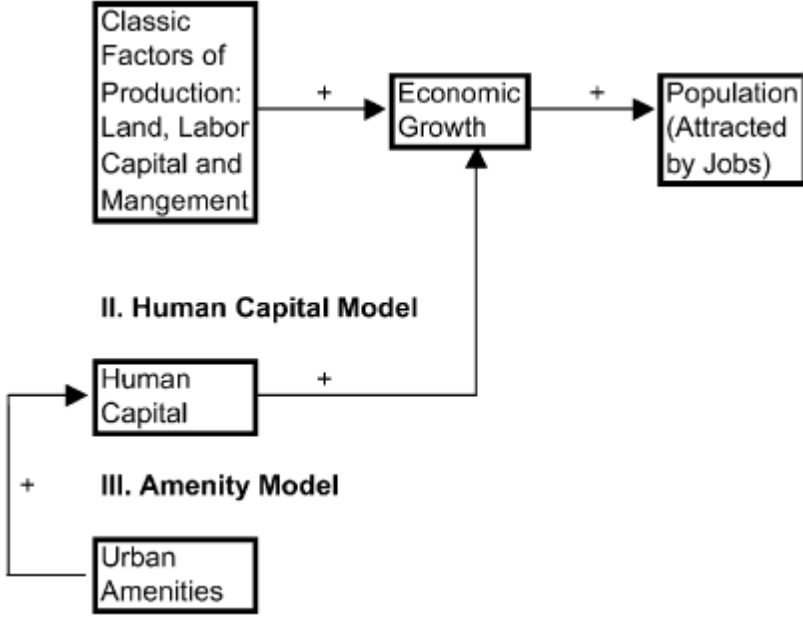
agreements (CAO's) which are made on a national level. An example of this are the strikes by the city cleaning staff in Utrecht and Amsterdam recently which had national consequences.

But before we discount the Urban Productivity Premium completely, maybe other employment factors could play a role in why the accommodation in Amsterdam is so much more in demand than in Heerlen. Marlet (2009) hypothesizes that for the Netherlands, although the productivity argument does not hold, the large supply of jobs still does. This brings additional advantages for the individual. For one, as the job supply is high, there exists a higher probability on better *matching*. Individuals are therefore more likely to find the jobs they pursue in for example the Randstad, than in Leeuwarden. Second, with a large availability of jobs, the costs of becoming unemployed can be much smaller than in areas where jobs are scarce. In fact, in the latter situation, it might force a household to move to a different location. Indeed, Marlet (2009) finds that the accessibility of jobs does seem to have a significant positive correlation with housing prices. But that still is not the whole story as it for example cannot explain the differences in demand for housing in Amsterdam compared to Rotterdam.

Amenities

According to Clark (2003) human capital theory is incomplete without amenities. Human capital, as main driver of urban growth, is well recognized, but very few explanations have been offered on why human capital clusters in some cities and not in others. He argues that amenities are the missing link in the model of explaining urban growth. Clark (2003) proposes a model that states that amenities attract human capital which stimulates economic growth, which depends on the availability of resources and leads to population growth as jobs are created and attract additional people. This model is presented in figure 1 below. When the measure of demand was discussed above, it was argued that for the Netherlands, population growth is not an adequate indicator. Therefore, the model by Clark (2003) which suggests a positive impact of economic growth on population, does not necessarily hold for the Netherlands. However, at this point it is still a relevant model to discuss as it incorporates the effect of amenities on the level of human capital and economic growth.

Figure 1 - Models of Urban Development from Clark (2003)



While thinking about urban amenities, we have to realize that even historically they played a vital role on the view on a city. Take for example the Coliseum in Rome or the Akropolis in Athens. Cities can be defined by their amenities, as Paris is by the Eifel Tower, Sidney by the Opera building and New York by the Statue of Liberty. Before further exploring their role in attracting human capital, it is necessary to define what is meant by amenities in this report.

An important characteristic of amenities is that they are location bound (Glaeser et al., 2001). For example, a car is something one can enjoy, but it is not bound to the city. Restaurants, cafés, parks and museums are all location bound and thus can be considered as urban amenities. Amenities can have the characteristics of a public good, as in the case of green air. But most amenities are not fully public goods, and can be considered a semi-public good, such as a museum, theater, or stadium (Clark, 2003). Taking it one step further, a meal at an exclusive restaurant has very private aspects, but is still included in many analyses on amenities. Clark (2003) argues that people do not have to consume the product or service for it to be of value to them, there is also a value in having the option to consume the product or service. This is called the *option value*. In the example of an upscale restaurant, which can exclude customers, Clark (2003) notes, that the presence of such a restaurant can define the local context. In a way, the restaurant has spillover effects to its environment and which in total can attract people. Therefore, Clark (2003) included such in his analysis on amenities.

In the literature, different categories of urban amenities are presented. Glaeser et al. (2001) define four types of amenities. The first type is the presence of a *rich variety of services and consumer goods*. The *aesthetics and physical setting* of a city account for the second type. The third is the availability of proper *public services*, such as schools, safety, clean air. Lastly, they define *speed*, the fast accessibility of services but also the availability of fast transportation networks that facilitate the mobility of the individual. Clark (2003) employs a different distinction between amenities. He separates

natural from *constructed* amenities. A natural amenity is for example an ocean view. A constructed amenity is a theater, restaurant or a stadium for instance. For his research on Dutch cities Marlet (2009) distinguishes between *dwelling specific* and *location specific* amenities. The former includes for example the size and the architectural or aesthetical value of accommodation. The *location specific* amenities concern the direct living environment of the individual, such as safety, the availability of green spaces and accessibility to transport networks. For *location specific* amenities Martlet (2009) further distinguishes between amenities in the direct living environment (or neighborhood), the city, and the surroundings of the city.

The relationship between amenities and urban growth has carefully been researched. For American cities it has been shown that amenities attract people by Glaeser et al. (2001) and Clark (2003). In the former, the authors find that temperature, dryness and proximity to the coast are powerful predictors of county growth. They also find positive effects for live performance venues and restaurants per capita on county growth. Although not all consumption amenities are significant predictors of county growth, they argue that the ones that are harder to copy and accommodate the higher human capital workers have a significant positive effect. Bowling alleys, which the authors argue are easier to copy, are not found to have a significant effect. In their empirical analysis they do not incorporate the relationship between public services and economic growth, but point to other publications that show a strong negative relation between crime and city population growth (Cullen & Levitt, 1999) and a positive relation between government spending on schools and city growth (Rappaport, 1999). Clark (2003), who distinguishes between natural and constructed amenities, finds that older people tend to move towards places that are rich in natural amenities (temperature and climate) and college graduates are more numerous in places with a large supply of constructed amenities (juice bars, whole foods stores, libraries). Marlet (2009) finds that both *dwelling specific* as *location specific* amenities can significantly contribute to the attractiveness of cities, measured by the housing prices at neighborhood level. Among the significant location specific amenities are, crime rate (negative relation), soccer stadiums, performing arts facilities, culinary quality, amount of café's, historical centre and canals and proximity to nature and the coastline.

Concluding, the interest for attracting people stems from the notion that the performances of cities are dependent on the make-up of their population. Attracting human capital for policy makers has thus become a priority. Research shows that for the Netherlands, it is not the availability of jobs a city can offer that determines the demand for location, but rather the accessibility of jobs *from* the city. Furthermore, a shift in perspectives on the city from a productive to a consumption centre have increased the interest in the supply of urban amenities. Amenities are found to attract people. But not all amenities attract the right target group for a city. Therefore, it is important to establish who the city is trying to attract.

2.5. Attracting who?

In Richard Florida's best-selling book *The Rise of the Creative Class* (2002), he offers a new theory on regional economic growth. However, as we will see, the theory is hardly new, but rather adds to the already existing human capital theory.

Florida (2002) argues that not just do general people drive economic growth, but especially a certain group of people, namely the *Creative Class*. Members of this class are creative and innovative which translates into a higher productivity. Creative people are drawn to cities in which there exists a wide variety of 'local' consumer amenities, such as bars, coffee houses, live performance venues. In this way, the theory is not much different from the amenity theory of Clark (2003). More important of the creative class, is their work *ethos*. The creative *ethos* is a combination of a Calvinistic work spirit and a hedonistic lifestyle. In other words: *Work hard, Play hard*. The creative people are not the regular nine-to-five office employees, but work hard when it suits them, even if that is in the middle of the night. The creative person also enjoys socializing with other creative people in coffee houses or bars, where they can exchange ideas and in that way add to their creative capital. But also this notion hardly seems new as Jacobs (1969) and Lucas (1988) already were convinced of importance of social networks for increasing human capital. Florida's empirical analyses have also been criticized. In a response to the theory Edward Glaeser (2004) shows with some regression analyses that the creative class does not significantly better predict economic growth than the presence of the highly educated. The creative theory would add nothing to the already existing human capital theories for regional economic growth.

In a response to Glaeser's critique, Florida (2004) argues that his concept of the creative class does not substitute human capital theory, rather it aims to deliver a better indicator for measuring people's skills and their actual contributions to the economy. The indicator for the creative class is based on people's profession, what they in fact contribute to society. In comparison, the measure of the highly educated people is only based on their diploma, a piece of paper. For example, a university graduate who is currently unemployed, would be included in the measure for highly educated people in a city, but would not contribute to the creative class. On the other hand, a successful designer without a diploma who does contribute to the economy, does show up in the creative class, but not in the classic human capital indicator. In a way, there is more to people than the education level suggests. And the *creative class* indicator is a way of measuring peoples contributions to the economy, rather than their performances in school. Although the *Creative Class* is always associated with bohemian types, hippies and gays, in fact it is just another indicator of human capital as it aims to measure skills. As such, Marlet & Woerkens (2007) find that the creative class is a better predictor for employment growth in cities than the share of highly educated people (Marlet, 2009). Should we then discount education as a driver for economic growth?

No. Although some people in Florida's creative class are not highly educated, most of them are. For the Dutch population, Marlet & Woerkens (2007) find a high correlation of 73% between the share of the creative class and the share of highly educated people in Dutch cities. However, they find higher coefficients for the creative class explaining employment growth, and when both are added to the model, the significance for the share of highly educated people drops down

substantially (Marlet, 2009). However, the authors also note that they are doubtful that these positive relation with the creative class and employment growth have ‘anything to do with bohemianism, or creative ethos, other than social interaction as meant in the human capital theory’ (Marlet & Woerkens, 2007: p. 2620).

Another aspect of the Florida’s theory is that the key to attracting the creative class is not merely amenities, but openness or tolerance. Creative people flourish in an environment that is open to new ideas, and have ‘low barriers to entry’ (Florida, 2005a, p. 130). Using indicators for ethnic diversity, and the presence of bohemian people and gays among the population, Florida’s establishes a proxy for ‘tolerance’ and shows that high educated people are more numerous in tolerant cities (Florida, 2005a, p. 134). Florida also points out that creative and high educated people are attracted to the aesthetics or the physical setting of a city (Florida, 2005b). In testing these effects for Dutch cities Marlet & Woerkens (2005) find that the indicators for tolerance cannot significantly explain the share of creative people in a city. Aesthetics, measured by the share of historical buildings and proximity to nature, do have an effect on attracting the creative class (Marlet & Woerkens, 2005). However, Marlet (2009) also notes that these results are similar when attempting to explain the share and the growth of high educated people in a city.

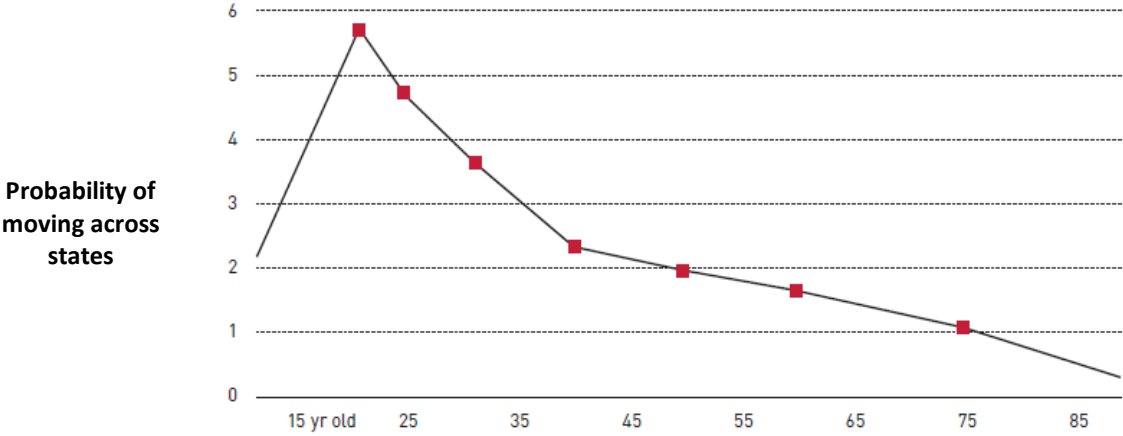
Concluding the discussion on the creative class in the Netherlands, the creative class as defined by Marlet & Woerkens (2007) does explain employment growth more powerfully than just education level. This is due to the fact that the indicators for creative class regards what people actually *do* instead of what is on their résumé. However, as creative people are often also highly educated, and both are attracted to the same aspects of a city, it seems that education level is still a very useful indicator for further analyses.

2.6. Attract people when?

In the more recent book by Richard Florida “Who’s your city?” (2008), he argues that in the span of a life-time, individuals in the United States generally make three big moves. The first move is when one goes to college. Increasingly, young people leave the parental house for college, and for the first time they live on their own. The second move is when the student graduates and moves to a place to live and work. Job opportunities and consumption amenities can be important factors to the recent college graduates. Furthermore, as people stay single longer they are more flexible in their location decisions, and do not demand spatial accommodation, which allows them to be close to the high density inner cities, where one can walk to bars, cafes and public transit and enjoy the social interaction (Florida, 2008, p. 242). In fact, the search for a future life partner can be an important factor in location decision as Florida points out. The last big move is when the person’s settles down with his or her partner, and perhaps even children already. Often, married couples with children will move to areas where there is more green space for the children to play, more safety in the streets, and larger accommodation to have enough room for the whole family.

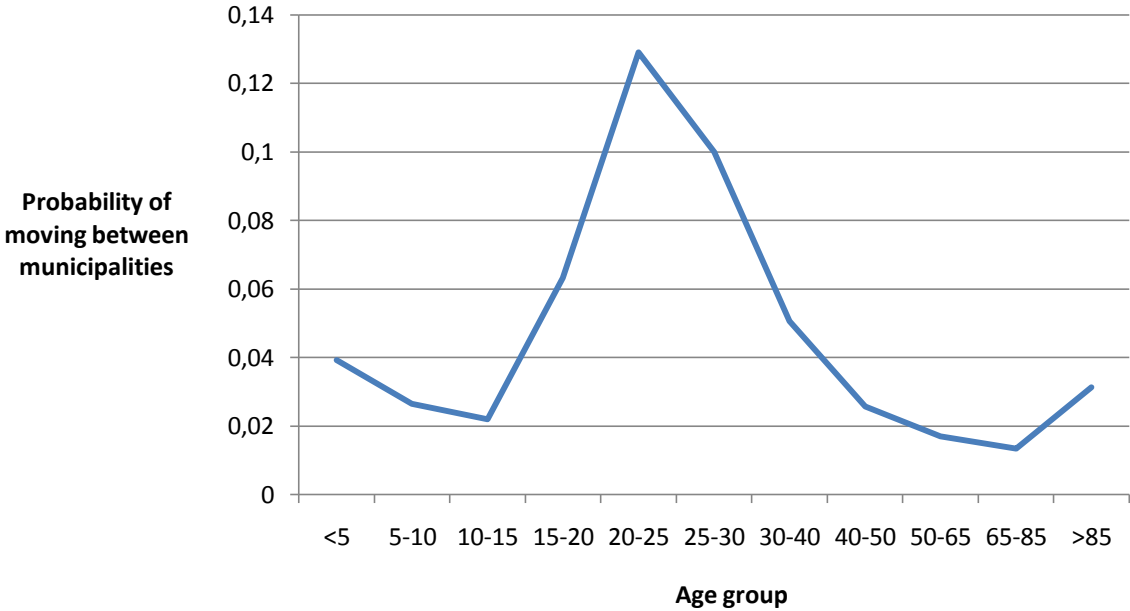
How is this information relevant for this topic? As it turns out, the likelihood of moving across states in the U.S. peaks before the age of 25 according to a study of Cortright and Coletta (2005). After that, the likelihood to move drops down significantly with age. It decreases by a factor of three in a twenty year span from 25 to 45 years old (Cortright & Coletta, 2005, p. 9). This can be witnessed in the figure below.

Figure 2 - Probability of an interstate move in percentages, 2002 to 2003, by age (adopted from Cortright and Colleta, 2005)



Also for the Netherlands this effect is visible. The Dutch Central Bureau of Statistics calculates the likelihood of moving for each age group by dividing the total amount migrants of an age group by the total amount of inhabitants that age group. In the graph below, the likelihood of moving is depicted for the different age groups. As can be seen, people are most likely to move when they are between the age of 20 and 25. After which the likelihood only decreases until it rises again at an age of higher than 85.

Figure 3 - Probability of moving between municipalities for the Dutch population (3-year average 2006-2008, data from CBS.)



In the competition between cities for attracting human capital this has vital implications. When cities are able to attract the young and highly educated, the benefits are long term as the probability that the individual moves away from the city decreases with age. When cities fail to attract young graduates, it will face even more difficulty in doing so later on. Florida agrees by stating:

“Places that lose young people will never be able to recoup, since moving slows down with age. The winning places are the ones that establish an edge early on, by attracting residents in their mid-twenties. These places gain a long-lasting advantage; those that lose out find it all but impossible to catch up.” (Florida, 2008, p.227)

As people with a higher education level are also more likely to move across states than people with a lower education, it makes the young and highly educated population a highly mobile group, which can be won or lost (Cortright & Coletta, 2005). To which aspects the young highly educated are especially drawn to is much less clear. Clark (2003) is one of the few who analyzed the effect of amenities on different populations. As stated briefly above, the young are especially attracted to cities with a large supply of *constructed amenities*, such as restaurants, bars, live performance venues, coffee bars etc. Also for the young American population, Forbes magazine asks young singles what is the most important factor in their location decision. The most important turns out the ‘number of other singles’, quickly followed by ‘great career prospect’, further behind is ‘wild nightlife’ and ‘low costs of living’. But these are hardly scientific results. Perhaps an indirect approach can be taken. Discussing the creative class, Cortright & Colleta (2005) show that there is a strong correlation between the presence of the creative class and the presence of recent college graduates. This could mean that a large share of the college graduates is part of the creative class, but also that the two are drawn to the same cities. If we assume that indeed the young highly educated are attracted to similar aspects of a city as the creative class, the results from Marlet (2009) which shows to what aspects creative people (and people with a high level of education) are drawn can also be applied to predict to which cities young highly educated people are likely to move.

2.7. Conclusion

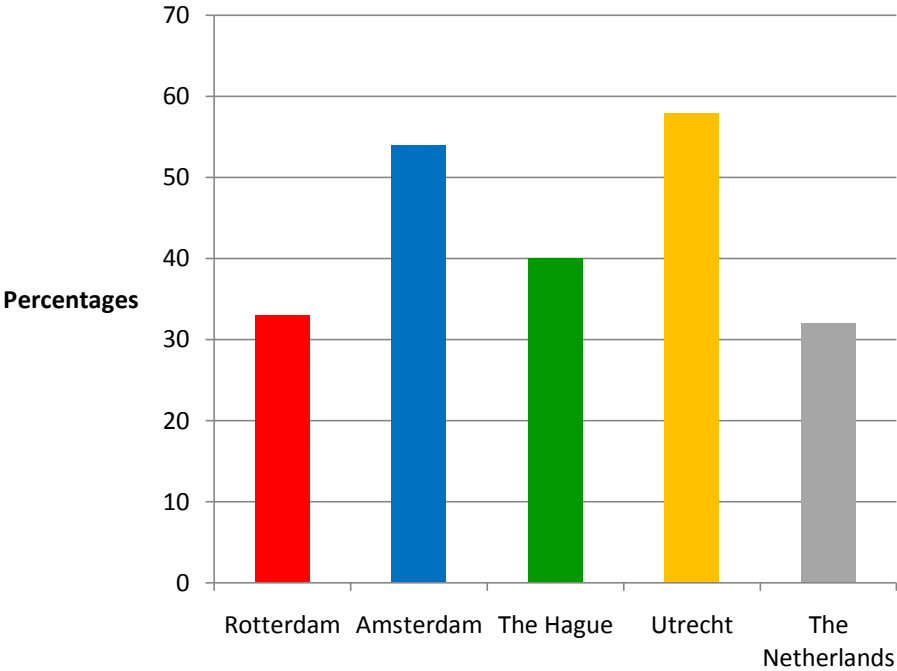
Before this paper turns its focus towards Rotterdam, it aimed to discuss urban growth theories. In the first section, we saw that the agglomeration forces can still provide valid arguments for explaining the clustering of firms and households in cities. However, it cannot account for the differences within a region. A shift in perspectives from the production perspective to the consumption perspective was apparent, which also lies as the base for more recent human capital theories. Human capital is increasingly recognized as the engine of urban economic growth. Attracting people therefore has become more popular among policy makers. Highly educated people, being the most mobile, can be won or lost by cities. Knowing what attracts them is key to local policy. A right mix of urban amenities seems to be able to attract highly educated people. However, as probabilities of moving between municipalities decrease after the age of 25, cities would be wise to target the young highly educated. To which amenities or aspects of the city they are attracted, has not been widely studied, and provides the starting point for this paper.

3. A closer look at Rotterdam

3.1. Share of highly educated people

As we have seen in section 2.3, human capital is a vital ingredient for the performance of the local economy. Furthermore, we have established in section 2.5 that education level is still a good indicator of the level of human capital. In various studies, researchers analyze not the average education level of the population, but rather regard the amount of people that have finished a higher level education with respect to the total workforce. In the case of the Netherlands, the Central Bureau of Statistics regards people as highly educated when they have finished the equivalent of an HBO bachelor education or higher. As can be seen in Figure 4, Rotterdam has the lowest share of highly educated people compared to the other three major Dutch cities, Amsterdam, The Hague and Utrecht. In fact, among the 50 largest municipalities, Marlet (2009) reports that Rotterdam is ranked 24th, a couple of percentage points below the average of those 50 municipalities. The literature research pointed towards the conclusion that a higher share of highly educated people would be beneficial for the city.

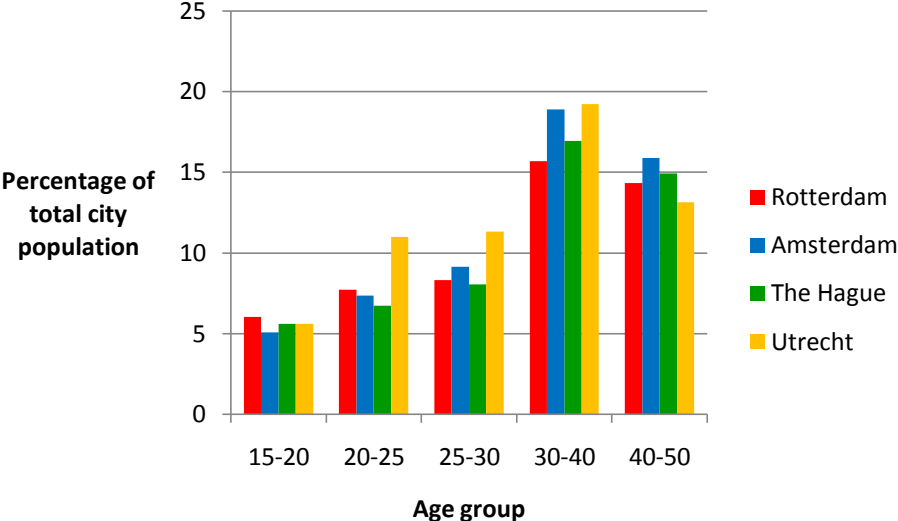
Figure 4 - Share of highly educated people in relation to the total workforce (OBR, 2010)



To get a better understanding of the population make-up of Rotterdam, we can take a look at the relative sizes of the different age groups. This is depicted in figure 5 for the four major cities. As can be seen, Utrecht has large relative share of 20-25 and 25-30 year olds. This is probably due to the relatively large draw of students. For the category of 20-25 year olds, Rotterdam has a larger share than Amsterdam. However, for 25-30 year olds, although the share of Rotterdam's population increase barely, Amsterdam's share in that age group is a much larger than the

previous. However, from these numbers are static and say little about the city’s capabilities to attract young and highly educated people. For that, we can analyze migration statistics.

Figure 5 - Size of age group, as a percentage of total city population (CBS, 2010)

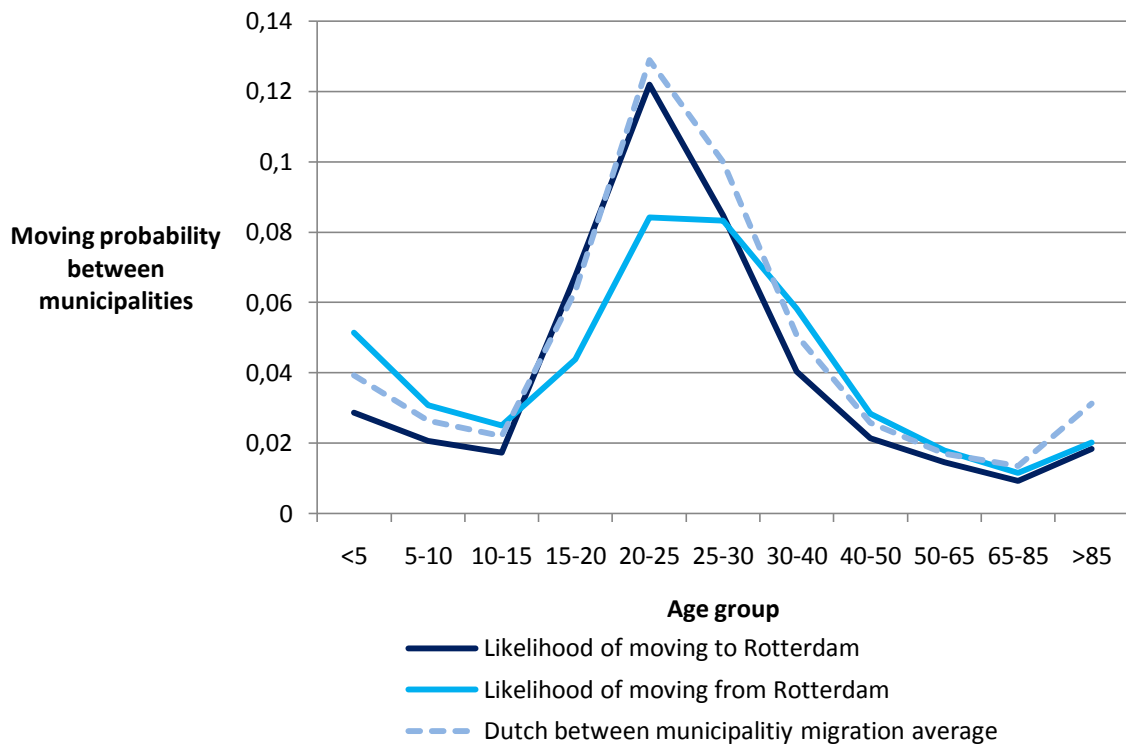


3.2. Migration towards and from the city

In order to gain further insight into the population of Rotterdam, we can analyze the migration statistics. Recall the figure in section 2.6 concerning the moving probabilities between Dutch municipalities. It showed a curve that peaked around the age of 25, and declined afterwards. This implied that the older people get, the less likely they are to move to another municipality. Therefore, it is easier to attract people to a city when they are younger (20-25) than when they are older.

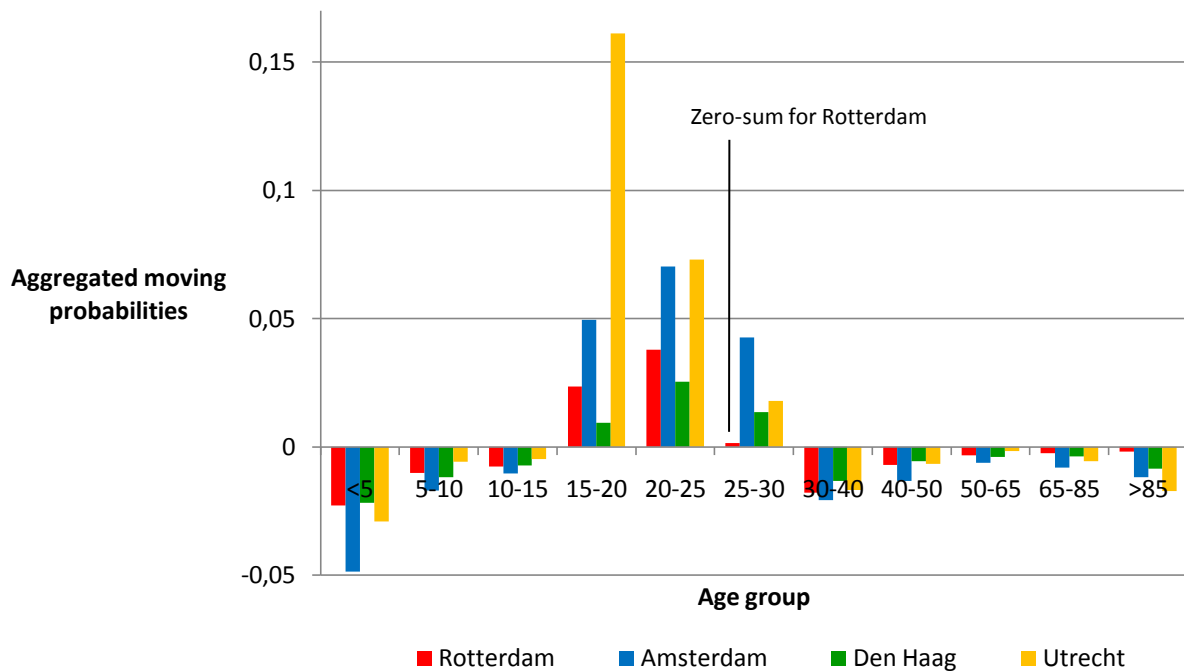
For Rotterdam holds that the likelihood to move to Rotterdam and the Dutch average follow a similar rise for the age groups 10 to 25 years, but after the age of 25, the likelihood the move to Rotterdam is below the national average suggesting that people are less likely to move to Rotterdam compared to the average municipality. Second, the likelihood of moving from Rotterdam is quite high from young children, indicating that young families are more likely than average to move away from Rotterdam. This also corresponds with the age groups 30-40 and 40-50 in which people are likely to either start a family, or have a family already and choose to move away from the city.

Figure 6 - Moving probability towards and from Rotterdam for different age groups (CBS, 2010)



However, this is completely normal for cities to have a negative moving ratio for young families. For the higher income classes in Rotterdam, family extension and marriage is an often named reason for moving away from the city (Dujardin & Van der Zanden, 2010). Young families often prefer a spacious, green, and safe environment for their children to grow up. Marlet stresses the importance of the capability of a city to capture they ‘young households’, the young professionals without a family. In Figure 7 the aggregated moving probabilities are shown for the G4 cities: Rotterdam, Amsterdam, The Hague and Utrecht. Aggregated moving probabilities are constructed by subtracting the probability to move away from the city from the probability to move towards the city. Therefore, a positive number implies that the age group is more likely to move towards the city, and a negative number implies that the age group is more likely to move away from the city.

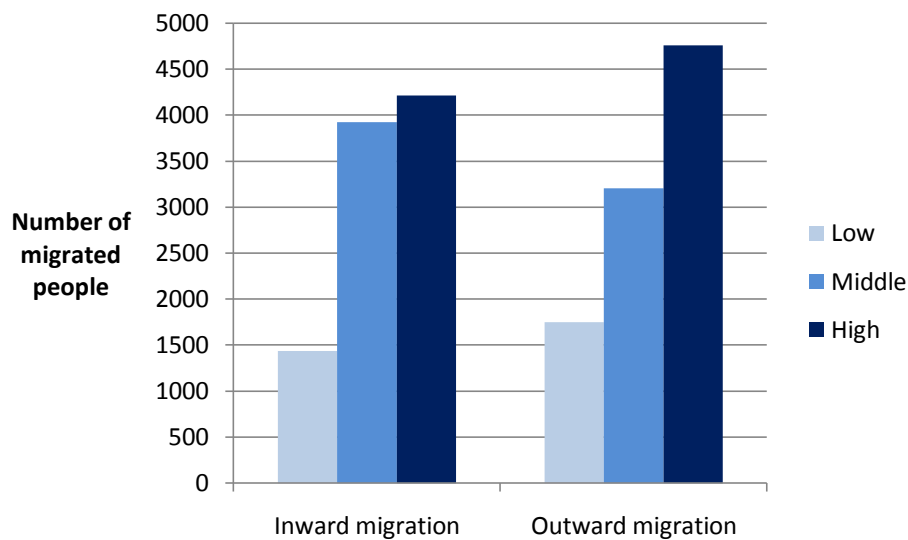
Figure 7 - Aggregated moving probabilities of G4 cities per age group (CBS, 2010)



As can be seen in the above presented figure, all cities experience migration from the city of the age groups above 30 years old. This is very likely due to the fact that young family households prefer outside city locations. Also noticeable is the enormous peak of migration towards Utrecht in the age group 15-20. This is possibly due to the large influx of students in a relatively smaller city. However, the most important point I would like to stress from this figure, is the score of Rotterdam for the age group of 25-30. In this age group, Amsterdam still gains people, just as The Hague and Utrecht, but then in smaller proportions. Rotterdam however, barely gains, as the aggregated moving probability is positive, but very small. This implies that compared to the other cities, Rotterdam **loses** the young households.

The other aspect interesting to look at is the education level of the people who migrate in and away from the city. As is visible in the figure below, more highly educated people left the city of Rotterdam in 2009, then moved in. The figure also shows that the highly educated are highly mobile, as they represent the largest migration groups.

Figure 8 - In- and outward migration statistics of 2009 for Rotterdam, for different education levels (CBS, 2010)



Concluding, we have seen that Rotterdam is not able to attract as much young population (25-30 years) compared to the other three large cities in the Netherlands. In addition, they are still lacking in the share of highly educated people and yearly, more highly educated leave the city than enter the city. To improve the economy of Rotterdam, it should aim to improve their capabilities of attracting and retaining young and highly educated people.

4. Research Methodology

From the literature review, we concluded that human capital is vital for a city's economy, and that human capital can be gained by attracting young highly educated people. Furthermore, as we have learned from chapter 3, Rotterdam fails to capture the young and highly educated. As the current Rotterdam students are potentially the young and highly educated population that Rotterdam aspires, this research aims to analyze how students view Rotterdam and which aspects influence their perception. Furthermore, it hopes to provide insight into the preferences of students in terms of places to live after graduation and the factors that play a role in the decision. To analyze such, a questionnaire can be designed and distributed among the target population. This chapter will therefore start off with the development of the questionnaire. Following, the method of data collection will be discussed and lastly the data analysis will be described.

4.1. Research framework

Before the we can address a conceptual model, it is necessary to look back at the research questions to determine what we want to measure. What do we want to know? In order to answer the main research question, the sub-questions should be addressed. The sub-questions were formulated as follows:

- R2: How do students perceive Rotterdam as a city?
- R3: Which preferences and factors influence the perception of the students of Rotterdam?
- R4: Which preferences and factors influence the preferences of students for places to live and work, after graduation?

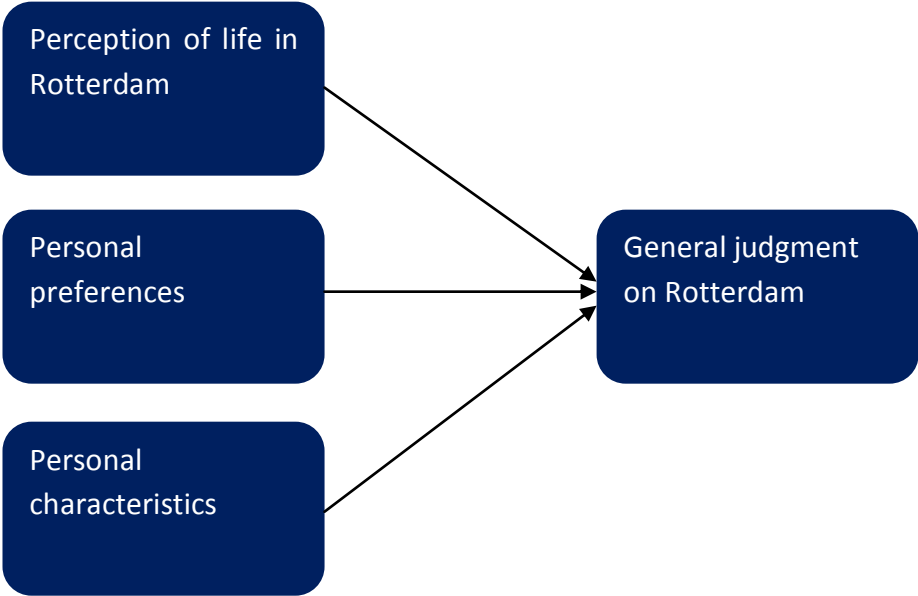
To answer the first sub-question, an overall judgment on the city of Rotterdam could suffice, but would sketch a very simplistic picture. To gain more insight into the problem, the second question needs to be addressed. For that, different aspects or factors would be analyzed. For the third question, one needs to analyze where students would prefer to live in the future and which factors influence the preferences.

In making location decisions Braun (2008) explains that residents or potential residents base their decision on two factors. On one side, the customer has preferences, or needs and wants. In this context, people have preferences for the type of environment they desire to live in. In their minds, they generate an 'aspired relevant environment' (Braun, 2008). On the other side, people have certain perceptions about different places and environments. They compare those perceptions to the 'aspired environments' and evaluate the benefits and sacrifices to eventually arrive at a conclusion that determines their spatial behavior. In addition, Braun (2008) suggests that the customer characteristics, such as age, background, income etc., influences both the customer's preferences and the perceptions.

In my view, the model as suggested by Braun (2008) is a relevant starting point for the conceptual model in this research as we aim to analyze what influences the student's perception of Rotterdam and the preferences for places to live and work after graduation, as also formulated in the research question. Furthermore, the student's characteristics could also have an effect, but next to demographic information, the experience with the city of Rotterdam might be more relevant. In the conceptual model of this research, the general judgment, measured by an overall opinion and a desire to live in Rotterdam, is determined by three factors.

First, the respondent's perception of life in Rotterdam has influence on the perception of the city as a whole. Because the target population involves potential inhabitants, it is relevant here to analyze their perception of life in Rotterdam. How do they view different aspects of the city? And which aspects weigh heavier in their overall judgment on Rotterdam than others? Second, the respondent's personal preferences, or the needs and wants of the customer, could have a large influence on the overall judgment on the city. Although one might rate the quality of leisure amenities very high, perhaps the respondent prefers peace and quiet in which case the urban environment of Rotterdam would be a mismatch. Third, the respondents characteristics could also have an effect the general view on Rotterdam. One example Braun (2008) mentions is the emotional connection to a community. If a respondent has always lived in Rotterdam, the emotional connection can dominate the opinion on the city. The conceptual model is presented below.

Figure 9 - Conceptual Model



Now that a conceptual model has been developed, we can turn to the questionnaire development in order to establish what we need to ask to get the answers we want.

4.2. Questionnaire development

4.2.1. General judgment on Rotterdam

For the purpose of this research it is particularly interesting to ask where the respondent would prefer to live in future, as the aim of Rotterdam is to attract and retain the young and highly educated people. Furthermore, in line with the model of Braun (2008) we inquire the respondent about his (future) spatial behavior which is influenced by the preferences and perceptions of the customer. Different however, is that we inquire about potential location decision, not the actual location decision. Nonetheless, where the respondent would prefer to live is a very relevant question to ask as it reflects the evaluation of the respondent's preferences with his perceptions. For a time frame, it seems reasonable to select five and fifteen years; five years because most students are expected to have graduated their current study, as the majority of educational programs do not exceed five years. In addition, it is expected that most of the students by then are either working already or on the job market and thus form the group that Rotterdam lacks and is targeting. In fifteen years, the situation can be completely different. It is likely that the respondents have moved away from the city to start a family, which is a common reason to leave the city (Dujardin & Van der Zanden, 2010). It would be interesting to see if indeed, respondents who prefer to live in a city in five years from now, would not consider living in a city in fifteen years. Furthermore, as it is also important to identify the respondents who are unsatisfied with Rotterdam, but do prefer urban environment, the option of preferring another large city is essential for this research. Then there are three other categories that are increasingly less urban: just outside a large city, in a medium sized city, or in the rural areas. To overcome confusion, some examples are mentioned next to the options. The idea is that the respondent selects **one** option for '5 years' and **one** option for '15 years'. The question would look as following.

In five and fifteen years, where would you prefer to live?	In 5 years	In 15 years
In or near Rotterdam	<input type="checkbox"/>	<input type="checkbox"/>
In or near another large city (e.g. Amsterdam, Utrecht)	<input type="checkbox"/>	<input type="checkbox"/>
Just outside of a large city	<input type="checkbox"/>	<input type="checkbox"/>
In a medium sized city (e.g. Arnhem, Haarlem)	<input type="checkbox"/>	<input type="checkbox"/>
In a village or rural area	<input type="checkbox"/>	<input type="checkbox"/>

To establish the measure of general judgment on Rotterdam, it is proposed to inquire the respondents on their view of Rotterdam as a city in general, and Rotterdam as a city for students. This distinction is important, as the former still holds in the future when they are no longer students. The latter focuses more on what they think of the city now, for their current lifestyle. Another reason to create a general measure is to be able to differentiate the effects of various independent factors. In other words, we need to be able to analyze which aspects of Rotterdam matter more to the student population in their overall opinion on the city than other factors. The respondents are asked to rate both aspects on a five point Likert scale, ranging from *1=very negative* to *5=very positive*. Echtner and Richie (2003) observe that in destination research, a Likert type scale is often employed because of the ease to construct the questionnaire and the ease of analyzing the scores.

Overall judgment on Rotterdam	1	2	3	4	5
How would you rate Rotterdam specifically for students ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How would you rate Rotterdam in general ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

One of the risks of a Likert scale is that respondents can be biased to select middle options (Harzing et al, 2009). To gain more clarity in their view of Rotterdam a ‘yes-or-no’ question can be included. For this a recommendation-type question is used. In marketing research, to test the consumer satisfaction, respondents are often asked whether they would recommend the concerning product or service to a friend. The idea behind it is that by recommending the product to a friend, they put their own reputation on the line, therefore the consumer must be very convinced of the quality (Reichfeld, 2003). Concerning locations or places, the indicator of ‘recommend a friend’ has also been widely used (for example in Kozak & Rimmington: 1999, 2000; on customer satisfaction after visiting Turkey and Mallorca respectively; and Hui, Wan & Ho: 2007; testing for Singapore). It must be noted however, that there is a distinct difference between *stated* actions, and *actual* actions. Nguyen, Romaniuk and East (forthcoming) test through a survey whether respondents who indicated that they would recommend the product to a friend, actually *did* recommend it. After one week, only 30% of the respondents lived up their intentions of recommending. However, over 90% of the respondents who indicated that they would *not* recommend it, also did not. The conclusion from this result might be that negative intentions are easier to follow-up than positive intentions. In other words, “recommending is easier said than done”. Thus, the positive response in the questionnaire might contain less value that previously supposed. Although this research does not focus on customer referrals, this should be taken into account when interpreting the results. Nevertheless, asking the question “Would you recommend Rotterdam to a friend as a city to live?” seems an appropriate indicator of overall satisfaction. In addition, I want to distinguish between living and working in Rotterdam and therefore ask both questions.

Would you recommend Rotterdam?	Yes	No
Would you recommend Rotterdam to a (distant) friend as a place to live ?	<input type="checkbox"/>	<input type="checkbox"/>
Would you recommend Rotterdam to a (distant) friend as a place to work ?	<input type="checkbox"/>	<input type="checkbox"/>

4.2.2. Perception of life in Rotterdam

As this research focuses on the student population of Rotterdam, the questionnaire aims to capture the elements of the life of a student in Rotterdam. It attempts to ask to students about their perceptions on different aspects of the city. To envision the daily life of a student, we can ask ourselves where the student is at any time of the day. In broad terms, we can divide the possible answers into four categories. First, the student can be at his or her ‘direct living environment’ which includes ‘home’ and the neighborhood surrounding the home accommodation. Second, the student often spends time at the university campus, studying, working on group projects, or even merely socializing. In the day of a student, the university complex certainly plays a role. Third, the student can often be found in the city. After all, students consume recreational and cultural goods at a high rate (Russo, van den Berg, & Lavanga, 2003). Fourth, students can be active in other organizations such as sports clubs, drama clubs,

fraternities and sororities or even having a side job. These four categories form the base for the structure of the questionnaire. Specifically which indicators will be used per category will be addressed in the following sections.

The direct living environment

To test the respondents for the perception on their direct living environment, the following items will be presented:

Theme 1: Your living environment in Rotterdam

Quality of your home
Price of your home
Quality of your neighborhood
Accessibility to transport networks (metro, roads)
Accessibility to services (grocery stores, bars, etc)

In the literature, Marlet (2009) is one of the few authors that uses indicators at the accommodation level in order to explain price differences of housing, while controlling for size and type of accommodation. The quality of the accommodation can certainly play a role in the experience of the respondent of the city. Furthermore, also the direct living environment, thus the neighborhood, can have an effect on the perception on the city. Marlet (2009) agrees that quality of the neighborhood also plays an important factor in deciding where to live. The author employs various indicators at the neighborhood level to explain price differences such as nuisance, gentrification (measured by the amount of artists living in the neighborhood), water, the proximity to shops and the city centre, the amount of café's, the quality of the restaurants and finally the proximity to the North Sea Shore. Glaeser et al. (2001) merely look at the distance to the central business district to explain price differences. For this study, accessibility to the services of the city and other major transport networks to access job markets and recreational areas therefore seems appropriate to include at the level of the direct living environment.

Going out in Rotterdam

In order to test the respondent for their perception on life in the city centre, the following items will be presented:

Theme 2: Going out in Rotterdam

Places to shop
Places to eat
Places to drink
Places to dance
Ease of transport within city (getting around)

The importance of small amenities, such as bars, restaurants café's was already stressed by Jane Jacobs (1969). In such venues, people meet, socialize and exchange ideas. For students, bars, where alcoholic beverages are available, are a regular meeting point as the student population consumes alcoholic drinks at a high rate (Maalsté, 2000). However, Clark (2003) finds that also a

large supply of coffee places can be an attraction for the recent graduates. To include both categories of bars / cafés the items are listed as *places to drink*. A similar approach is taken for the other categories.

In the literature, the amount of restaurants and culinary quality are used by Marlet (2009) and Glaeser et al. (2001) to explain the attractiveness of a city. Although the financial budget of a student traditionally does not allow it to eat in restaurants often, restaurant can still be of value to the student in terms of *option value* as they facilitate the local context (Clark, 2003). *Places to eat* therefore still seems as a relevant indicator to include in the questionnaire. Another common indicator is the amount of live performance venues. Clark (2003) uses the amount of operas specifically. Generally, students are not the target audience of opera's. Other music venues such as discotheques, clubs and live performance stages do target the young adult population and should be considered in the questionnaire. Recent newspaper articles report on the lack of success of dance clubs in Rotterdam (Hoogstad, 2010). Apparently, the young crowd is not satisfied with the supply of dance clubs in Rotterdam. It would be interesting to see if this is also true for the student population. Therefore, *places to dance* is also included in the mix. The availability of consumer goods is also an aspect that Glaeser et al (2001) argue enhances the attractiveness of the city. *Places to shop* should measure the perception the students have on the quality of the supply of shops in Rotterdam. Lastly, the mobility within the city allows a student to explore more of the supply of small amenities of the city and therefore is also included in the questionnaire.

Campus life

One aspect that all respondents have in common is the fact that their studies are located in Rotterdam. It is expected that their experience of university or college education in Rotterdam also contributes to their experience of Rotterdam as a whole. Therefore, it seems reasonable to add a theme that concerns the life at school or campus. This theme should address some of the practical matters of studying in Rotterdam, such as the facilities, the lectures and accessibility of the campus, but also the enjoyable parts of campus life. Is it a nice place for students to spend their days? This can be related to the leisure facilities on campus but also the atmosphere and architecture in and around the educational buildings.

Theme 3: Campus life

Study facilities (computers, library, printers etc.)

Leisure facilities (dining hall, Smitse bar, coffee lounge)

Atmosphere, architecture

Campus accessibility (by car, bike, metro, tram, bus)

Lectures and classes

Extracurricular activities

Another theme that should be introduced concerns the activities that students engage in next to studying. This can be anything from sports to dance classes to fraternities or sororities. It can form the 'student life', but this certainly does not hold for every student. However, as these

institutions add to the student life, they can also function as an additional connection to the city. These institutions often add social circles which stimulate the exchange of ideas. Although not all the students are participating in such activities, their perception and especially their ranking of importance would be very interesting as the latter would give an indication of the *option value* they attach to the specific items. The theme extracurricular activities is presented below.

Theme 4: Extracurricular activities

Sport facilities (sport clubs, fitness centres etc.)
Performing arts facilities (dancing, singing, theater)
Student associations (fraternities, study associations)
Availability and accessibility of student jobs

Perception on intangible aspects of the city

Next to the four categories of the student's life in Rotterdam, the study aims to inquire the respondents on some general feelings of the city. Most literature does not discuss the feelings of the respondent about a city. For example, researchers often use crime statistics to arrive at a proxy for safety. However, the perception of safety can be very different from the actual level of safety. Especially in cities, Van den Berg et al. (2005) argue that there exist a safety paradox, which implies that although crime rates have been decreasing, the fear of crime has increased. It is the perception that has effect on the individual's spatial behavior. How can we measure such intangible aspects? Marlet (2009) and Glaeser et al. (2001) discuss the amount of historical buildings in a city centre as a proxy for beauty. It is suggested that historical centers, where organically restaurants and bars have given color to the environment, have more value than planned cultural centers (Santagata, 2002). But Rotterdam is famous for its modern architecture, a different kind of beauty, but perhaps still beautiful. The literature often does not account for such. Therefore, in the questionnaire it is proposed to ask the respondent about the following intangible aspects of Rotterdam.

Theme: Intangibles of Rotterdam

Beauty
Cozy atmosphere (NL: gezelligheid)
Vibrancy
Safety
Openness

Beauty is included to accommodate for the physical attractiveness of the city which Marlet (2009) and Glaeser et al. (2001) discuss. The *cozy atmosphere* is chosen as sometimes Rotterdam is referred to as being a cold city, thus an absence of coziness. The cohesion between the people, the small amenities and the city architecture perhaps plays a role in shaping a cozy environment. *Vibrancy* is selected as other authors also attempted to include a measure of 'liveliness' or the fact that the city is 'the place to be'. Marlet (2009) uses the amount of artists in a city to accommodate for a gentrification. It is hard to quantify or specifically define, but the level of vibrancy of a city could have an effect on attracting the young, bohemian and hip population. *Safety* is included as the importance of it has been empirically proven by Cullen & Levitt (1999). The perception of the safety in Rotterdam though can alter from the objective safety. The national monitor on

safety reports that the feelings of ‘unsafety’ are significantly higher in the region of Rotterdam and Amsterdam compared the national average (CBS, 2010b). Lastly, *openness* is used in this study as Florida (2002) heavily stresses the importance of tolerance in attracting the creative class. As such, an open environment and open atmosphere amongst the people could facilitate attracting the young and highly educated people.

Concluding, the perception of life in Rotterdam is build up of four environments in which the student is active. In addition, it is interesting to inquire about the perception of the students on the intangible qualities of the city of Rotterdam. This is depicted in the figure below:



4.2.3. Personal preferences

In the conceptual model, next to the perception of life in Rotterdam and the consumer characteristics, the personal preferences have an effect on the overall judgment on Rotterdam. Therefore, in the questionnaire, the study will test for the preferences of the respondent on the abovementioned aspects of life in Rotterdam: the direct living environment, going out in Rotterdam, campus life, extracurricular activities and perception on intangibles. To test the preferences the respondents are asked to indicate how important one aspect is to the respondent by ranking the different aspects in the level of importance.

In addition to indicating their preferences on the abovementioned items, the research also inquires about the preferences on different location decision factors. After graduation, it is likely that the student will find a job and move to another location. It is very relevant for this research to find out which factors are considered most important in their location decision. Below the location decision factors are presented:

In looking for a place to live and work after graduation, which are the most important factors?

Quality of the accommodation

Quality of the neighborhood

Vicinity (closeness) to friends, family and/or partner

Career opportunities

Access to leisure amenities (things to enjoy, bars, museums, cinema’s, soccer teams)

Marlet (2009) shows us that the *quality of accommodation* has influence on the attractiveness of the city. But as space is scarce in cities, people who genuinely prefer a spacious accommodation might rather choose to live outside of the city. The *quality of the neighborhood*, safe, green, spacious,

is also often found outside of the urban areas. Work, or *career opportunities*, is the most noted factor for either moving in or out of Rotterdam (Dujardin & Van der Zanden, 2010). People who follow work are most likely to live in larger cities as the supply of jobs is higher in urban environments. The importance of leisure amenities has been well established in the literature, as discussed in section 2.4. It could be that people who value the importance of their *access to leisure amenities* very highly would also prefer to live in urban areas, where the supply of leisure amenities is more abundant. Lastly, the ability to be close to one's friends or family can also play a large factor in the spatial behavior of an individual. In fact, around 20% of the people who moved **into** or **away from** Rotterdam lists this argument as a reason for the move (Dujardin & Van der Zanden, 2010). Therefore, *vicinity to friends, family and/or partner* is a relevant factor to include.

Concluding, the personal preferences should indicate which items on the questionnaire the respondent values as more important than others. Another set of items is introduced that aims to answer the question, which factor is most important to the respondent in deciding for a place to live and work. As such, the items of the personal preferences can be presented as follows:

Personal Preferences

- Importance of different aspects of the **direct living environment**
- Importance of different aspects for **going out in Rotterdam**
- Importance of different aspects of **campus life**
- Importance of different aspects of the **extracurricular activities**
- Importance of different aspects of the **intangible aspects of Rotterdam**
- Importance of different **location decision factors**

4.2.4. Personal characteristics

In social economic research it is common to inquire about social demographic information of the respondent, such as age, gender, nationality, income and education. For this research, age, gender, and nationality might still be relevant, but income and education are much less relevant, as most students have not yet started their professional career, and the researcher who distributes the questionnaire knows at which education level they are. In addition to age, gender and nationality it would be interesting to inquire about whether they are in the bachelor or master phase of their studies, as it says something about the length of their life as a student until thus far, and perhaps have considered future location decisions more seriously as the student life is almost about to end. Furthermore, it might be interesting to test for differences among academic interests. This could be done by asking in which study program they are currently enrolled.

Perhaps more importantly for the purpose of this research is to inquire the respondent about the amount of his or her experiences in Rotterdam. This could have large consequences for policy advice. Especially as retaining the young and highly educated should be a priority for Rotterdam, the amount of experiences should have a positive effect on the perception of Rotterdam. Otherwise, the city might be able to attract young and highly educated people, but will lose them as soon as they get more acquainted with Rotterdam. Therefore, ask the respondents will be asked whether or not he or she lives in Rotterdam, how often he or she goes out in Rotterdam

and uses campus services and finally if he or she participates in extracurricular activities in Rotterdam. Summarized, the personal characteristics can be listed as follows:

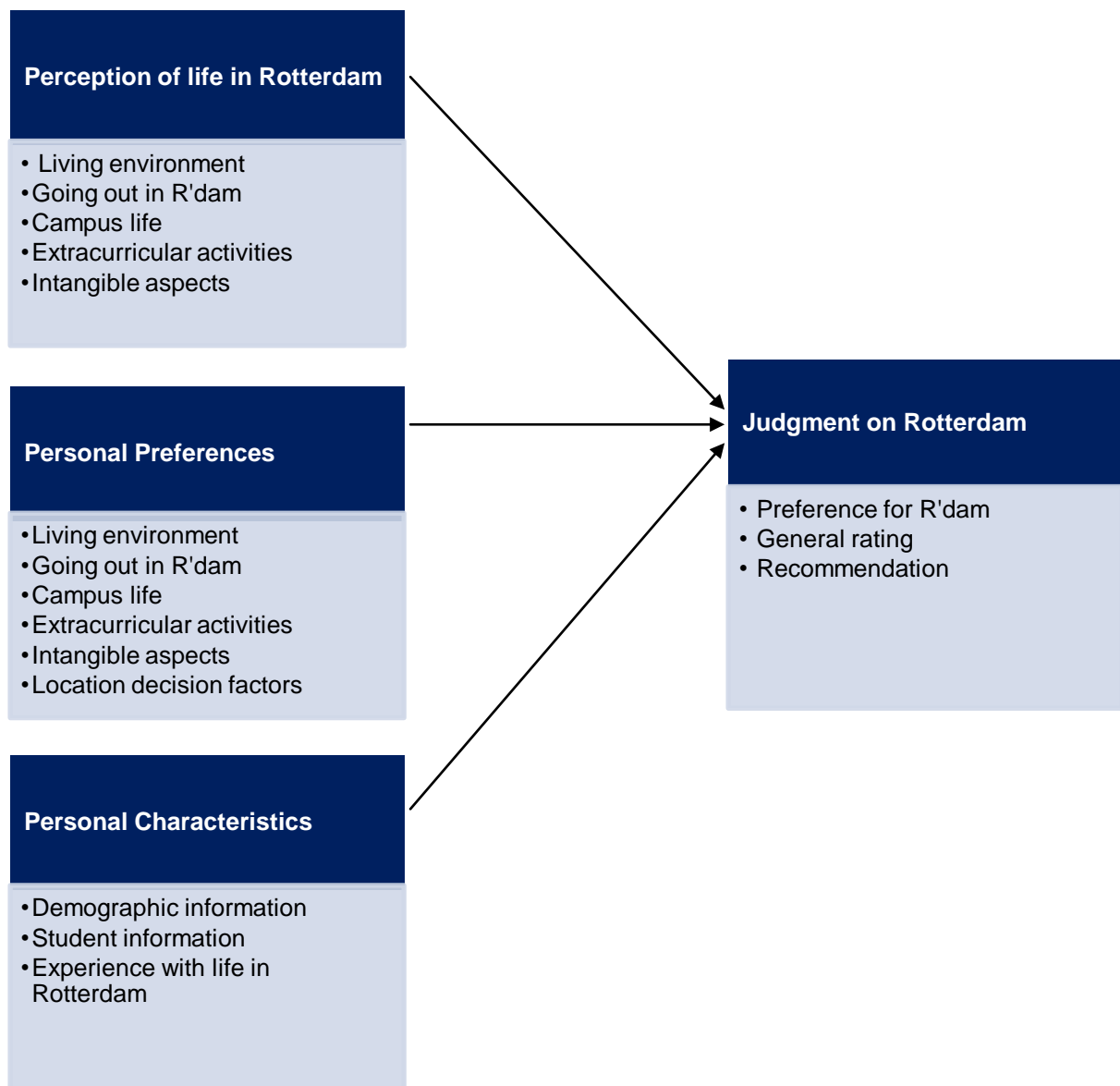
Personal Characteristics

- Demographic information (gender, age, nationality)
- Student information (phase of education, study program)
- Experience with life in Rotterdam
 - Respondent **living in Rotterdam?**
 - Frequency of **going out in Rotterdam?**
 - Frequency of using **campus services?**
 - Participating in **extracurricular activities?**

4.2.5. Final model

In the figure below, the final conceptual model is presented.

Figure 10 - Conceptual model with indicators



4.3. Measurement level

In the model, three factors affect the general judgment of Rotterdam. In this section, the measurement level of each factors will be discussed. The perception of life in Rotterdam uses a rating system on a 5-point Likert scale. The personal preferences will be measure by using a ranking based system. Finally, the personal characteristic will be measured mostly by dichotomous categorical variables.

The perception of life in Rotterdam and on its different aspects will be measured by using a rating system. The respondent will have to evaluate a specific aspect and rate it on a five-point Likert scale, with 1 being very negative, 3 being average and 5 being very positive. In the literature, Likert scales have been widely applied, and research has been conducted on the different response styles of subjects. It has been shown that there is a distinction between subjects who tend to select extreme options (ERS) versus subjects who tend to select the middle options (MRS) (Harzing et al., 2009). Harzing et al (2009) finds that in comparison to 5-point scales, 7-point scales show fewer effects of MRS and ERS, although still the effects are very present. Harzing et al (2009) discuss the possibility of standardization to eliminate response biases, but this is surely still contested, as often the researcher does not have theoretical arguments impose such data transformations. This research opts for the 5-point scale because of space and time limitations. However, the risks are certainly weighed when arriving at conclusions.

The personal preferences will be measured by employing a ranking system. When respondents are asked to rank multiple items in comparison with one another, it requires a high level of concentration as each option has to be weighed against the others (Harzing, 2009). The high level of concentration increases the quality of the responses and thus the data (Alwin & Krosnick, 1985). However, when the respondent are asked to rank more than five options, it takes a strain on their intellectual abilities and might tempt them to discard the questionnaire (Harzing et al., 2009). For example, in the theme of *going out in Rotterdam*, the respondents has to evaluate the quality of the *places to eat* in Rotterdam. But also, how important are places to eat in Rotterdam compared to the other items in the overall quality of *going out in Rotterdam*. If it is considered most important, the respondent puts *places to eat* in the first place. If *places to drink* is considered the least important, the respondent ranks that item in fifth place. As such, a measure in level of importance is created.

The personal characteristics will be noted mostly by using closed questions with two possible answers. There are dichotomies in gender (male versus female), nationality (Dutch versus non-Dutch), phase of education (bachelor versus master), if the respondent lives in Rotterdam (yes or no) and whether he or she participates in extracurricular activities (yes or no). The question for age and faculty are open. The questions concerning the frequency of going out in Rotterdam, and using the campus services have three options (rarely, sometimes, often).

4.4. Data collection

The questionnaire was tested on six of my peers in Utrecht. Individually, they required around 10 minutes to finish the questionnaire. After my introducing story and explanation on the rating and ranking system, they complimented the questionnaire on its clarity. Thus, the questionnaire was ready to be distributed among the target population. As the target group consisted of the students of Rotterdam, the aim was to collect a representative sample of the total student population in Rotterdam. It was chosen to distribute the questionnaires in the classes of students for multiple reasons. First, distribution in classes implies that there is a large group of potential respondents, and thus increasing the chance higher number of respondents. Second, as the respondents are not moving and classes are paused for 10 minutes, they are not likely to have other obligations thus often find the time to fill in the questionnaire. Hence it is believed that this increased the response rate. Third, as the researcher was personally present, it was possible to introduce the questionnaire, explain the system of rating and ranking and convince them of the research relevance. Lastly, the lecturers or professors were also present at the moment of distribution, and often spoke to the class about the questionnaire. The authority of the lecturer or professor might also have increased the response rate. However, there are also disadvantages of opting for class distribution. First, the researcher was dependent on the willingness of the teachers or lectures to free up 10 minutes of their time. This might have had an effect on the sample, as the most willing professors were often acquaintances of the supervisor of the researcher. Second, the sample might not be as diverse as a complete random sample from the student population. Although efforts were made to select different faculties, completely random it is not.

The data was collected in two different periods. The first period is in the end of June, 2009. The second period is at the end of September, 2009. The reason for it was because in June, many faculties start with their finals, and thus there were only limited possibilities for data collection. Therefore, in September, additional data collection was performed.

4.5. Data analysis

The collected data will first be analyzed at a very basic level. The means of the score on the separate items will be reported together with a correlation matrix. Afterwards, the conceptual model will be tested by addressing the following hypotheses:

H1: Perceptions of aspects of life in Rotterdam have an effect on the general judgment on Rotterdam.

H2: Personal preferences have an effect on the general judgment on Rotterdam.

H3: Personal characteristics have an effect on the general judgment on Rotterdam.

To test for these hypothesis, a manual backward stepwise logistic regression will be used. The discussion on this methodology is described in the next section. After the regression, a factor analysis will be conducted to see whether items on the questionnaire that resulted from the stepwise regression are measuring similar factors. The discussion on the factor analysis is presented in section 4.5.2.

4.5.1. Logistic regression

In the data set, two important dependent variables are of categorical nature. The first, whether a respondent would recommend Rotterdam as a city to live, is binary, as there are merely two possible outcomes: yes and no. The second, where the respondent would prefer to live in five years contains multiple possible outcomes: Rotterdam; Another large city; Outside a large city; A medium city or In rural areas. For these dependent variables it is not possible to perform a simple or multiple linear regression. This is because in such regressions, the model assumes a linear relation between the dependent variables and the predictor variables. However, when the categorical variables are used, there is no linearity in the corresponding values and thus the assumption of linearity is violated. To overcome this problem, it is possible to transform the data by applying a logarithmic transformation. “This transformation is a way of expressing a non-linear relation in a linear way” (Field, 2009, p. 267). Therefore, one can say that “in a nutshell, logistic regression is multiple regression but with an outcome variable that is a categorical variable and predictor variables that are continuous or categorical” (Field, 2009, p. 265).

Let us continue using the binary example from the data set in which case we try to predict whether a respondent would recommend Rotterdam as a city to live or not. In other words, given a set of responses to questions of the independent variables, we try to predict to which group the respondent belongs, the ‘recommenders’ or the ‘non-recommenders’. Because the outcome variable can only take on two values, 1 and 0, or Yes and No, we use a binary logistic regression. The logistic regression equation is based on the probability of an outcome $P(Y)$ occurring rather than predicting the actual value of variable Y . “In its simplest form, when there is only one predictor variable X , the logistic regression equation from which the probability of Y is predicted is given by (Field, 2009, p. 266):”

$$P(Y) = \frac{1}{1+e^{-(b_0+b_1 X_{1i})}} \quad (2)$$

In this example, $P(Y)$ would be the probability of the respondent checking either the box YES, or the box NO, leading to values 1 and 0. The predictor variable X can be for example the evaluative response to the safety of Rotterdam. The constant e is the base of natural logarithms and the coefficients b_n for a linear relationship similar to a simple regression. Naturally it is also possible to extend this equation by adding more predictor variables:

$$P(Y) = \frac{1}{1+e^{-(b_0+b_1 X_{1i}+b_2 X_{2i}+\dots+b_n X_{ni})}} \quad (3)$$

In the model the coefficients (the b 's) are estimated by fitting models. When the values of the predictor variables are inserted, the best model will be the one that predicts values of Y closest to the observed values of Y and thus have the most accurate coefficients.

Concerning the Odds Ratio

In contrast to linear regression, for interpretation purposes in logistic regression we need to analyze the value of the **odds ratio** (or as reported in the SPSS output: *Exp (B)*). It is an indicator of the change in odds resulting from a unit change in the predictor. In a sense, it is similar to the *b* coefficient but easier to interpret as it doesn't require a logarithmic transformation (Field, 2009, p. 266). Odds is defined as the probability of an event occurring divided by the probability of that event not occurring.

$$odds = \frac{P(event)}{P(no\ event)} \tag{4}$$

In our example, odds would be the chance of recommending Rotterdam as a city to live divided by the chance of not recommending Rotterdam. To come at the odds ratio, we compare the change in odds before and after a unit change in the predictor variable. The **odds ratio** can thus be defined as:

$$\Delta odds = \frac{odds\ after\ a\ unit\ change\ in\ the\ predictor}{original\ odds} \tag{5}$$

As for the interpretation, if the value exceeds 1, it means that as the predictor increases, the odds of the outcome occurring increase (therefore referred to as a positive predictor). The other way around, when the value is below 1, it suggests that as the predictor increases the odds of the outcome occurring decreases (a negative predictor). It is also possible to include categorical variables as predictors in logistic regression. SPSS requires one to declare which variables are the categorical ones, and to define the reference categories. For example, in my data set, whether the respondent lives in Rotterdam or not is a dichotomous categorical variable represented by the value 1 (=respondent lives in Rotterdam) and 0 (=respondent does not live in Rotterdam). In SPSS it is possible to choose different types of contrast analysis, but in I choose to use the default analysis which compares groups to the baseline group that usually have the value of 0. In the output, we will interpret effects of the categorical predictor *Live in Rotterdam*. In the table below, it compares the residents of Rotterdam (1=yes) to the non-residents, and in this particular example the odds ratio suggests that residents of Rotterdam are 5,6 times more likely to recommend Rotterdam as a city to live than non-residents. [Please note that this table does not represent the final model for this test].

	B (SE)	95% CI for Odds Ratio		
		Lower	Odds Ratio	Upper
Would you recommend Rotterdam as a city to live (0=no, 1=yes)				
Constant	-5,445 (0,807)***		0,004	
Beauty	0,924 (0,133)***	1,940	2,518	3,269
Coziness	-0,235 (0,092)**	1,185	1,542	2,008
Vibrancy	0,776 (0,145)***	1,635	2,172	2,885
Importance of neighborhood	-0,235 (0,092)*	0,660	0,790	0,946
Live in Rotterdam (1=yes)	1,722 (0,239)***	3,505	5,596	8,935

Note: R²=.34 (H & L), .38 (Cox & Snell), .50 (Nagelkerke). Model $\chi^2=264,820$ $p<0,001$. * $p<,05$, ** $p<,01$ *** $p<,001$

Concerning the other variables, beauty, coziness, vibrancy all appear to be positive predictors with a reported odds ratio above 1. Whereas the importance of the quality of the neighborhood and ones career opportunities are negative predictors.

4.5.2. Factor analysis

In social sciences, and especially with questionnaires, factor analyses are used to identify groups of variables (Field, 2009, p. 628). This can become visible in a correlation matrix where a subset of variables correlates strongly with one another and it can imply that those variables are measuring aspects of the same underlying dimension, which is called a factor (Field, 2009, p. 629). Generally, there are two types of factor analyses: exploratory and confirmatory. In the former, the researcher does not have *a priori* expectation on the amount of factors or a hypothesis to test. In the latter, the researcher desires to test specific hypotheses. According to Field (2009) when factor analysis was originally developed, it was intended to explore the data and develop further hypotheses. As a consequence, the techniques assume that the whole population is the sample at hand. However, in social science, rarely does the researcher possess the total population and therefore, a major disadvantage of the factor analysis is that the results cannot be extrapolated to the whole population. Field therefore argues that conclusion are restricted to the sample, and only if different sample reveal similar factor structure can some generalizations be defended. In this research, the sample is not randomly selected, even more reason to be careful with the conclusion. However, a factor analysis can still provide insightful information in understanding the dataset.

In the output of the factor analysis, there is a table with communality values. These represent the proportion of variance that can be explained by the extracted factors. When values close to 0 are reported it implies that the variance of the variable is not shared by the variance of any other variables. In other words, there is no underlying factor as the variance of the variable is unique to itself. Therefore, the variable does not lend itself for factor analysis and should be removed from the list of variables. However, in combination with the communality values, the loading factors should be inspected in order to judge if the variable has a significant contribution to the factor.

In the analysis, a correlation matrix can also be provided. We use this to check how the variables correlate with one another. In factor analysis it is desirable that variables correlate. Thus variables that do not correlate with another should be removed from the model. Furthermore, if there is a extremely high correlation ($r=.9$) it causes reason for concern. Lastly, a determinant is listed below the correlation table that should be higher than .00001 in order for multicollinearity not to be a problem (Field, 2009, p. 660). Other important statistics to analyze in factor analyses are the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. The KMO measure, varying between 0 and 1, show if the patterns of correlations are compact and thus a factor analysis would yield stable and reliable factors. According to Hutcheson & Sofroniou (1999) values between 0.5 and 0.7 are mediocre, between 0.7 and 0.8 are good, between 0.8 and 0.9 are great and above 0.9 are superb. Bartlett's test of sphericity measures if every variable correlates enough with all other variables. If the test is significant, it confirms that the correlations between variables are (overall) significantly different from zero, in factor analyses, a desirable result (Field, 2009, p. 648).

To judge the amount of factors, one can look at the scree plot as provided by SPSS, (and more specifically at the point of inflection) and the eigenvalues. The Kaiser criterion suggest that factors with an eigenvalue above 1 should be retained. Field (2009) discusses that Kaiser's criterion is accurate in cases when the number of variables is less than 30 and the communality values larger than .70. It can also be accurate if the sample size exceeds 250 and the average communality value is .60 or more. However, Field also notes that for larger datasets, 300 and above, Kaiser's rule might not be accurate, and perhaps a lower average communality value would also suffice. Lastly, there is the issue of factor rotation. Rotation maximizes the loading of each variable on one of the extracted factors while minimizing the loading on all other factors (Field, 2009, p. 653). The choice of different types of rotation depends on whether or not the researcher allows the different factors to correlate. The orthogonal rotations do not allow for correlations and the oblique rotations do.

5. Results

5.1. The sample

This chapter aims to present the results of the statistical analyses. But before it addresses the logistic regressions, some basic information about the sample will be discussed. The extensive tables with descriptive results are reported in annex B.

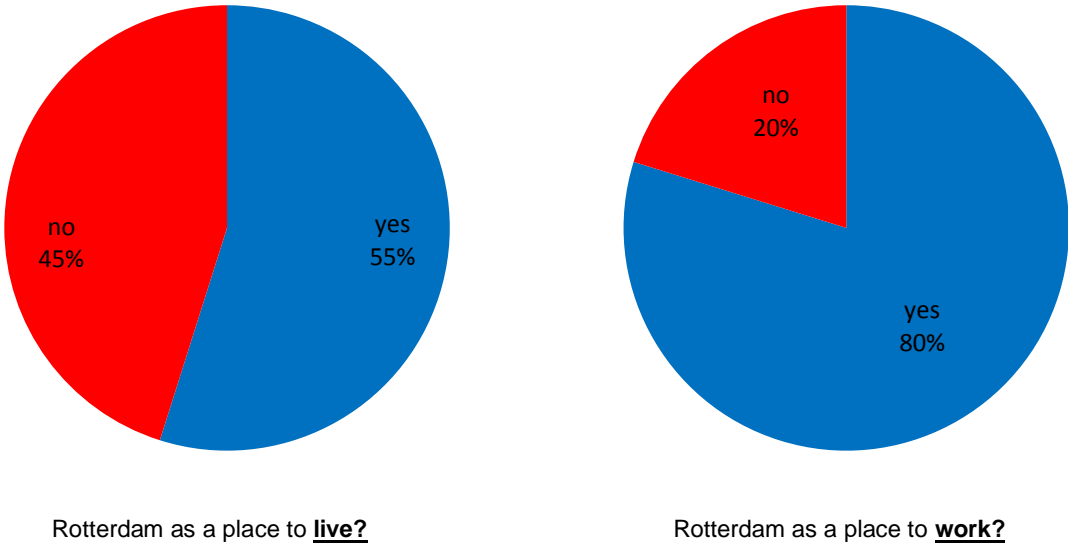
As mentioned in the previous chapter, the data was collected during two periods, using class distribution. In total, the questionnaires were distributed and collected in classes of seven different faculties. In total, 372 questionnaires were filled out by university students, and 208 by students of the Hogeschool of Rotterdam. The average age of the sample is 21, 49% lives in Rotterdam and 63% are males. The statistics per faculty are reported below.

Table 1 - Sample statistics, presented for different faculties

	N	mean age	standard deviation age	gender (in % males)	Rotterdam residents (in %)
Faculty of Social Sciences	32	20,39	2,07	31	63
School of Economics	209	20,38	2,09	59	62
Institute of Health Policy and Management	70	24,50	4,34	20	51
Faculty of Philosophy	39	23,97	4,57	59	74
Erasmus School of Law	22	26,95	4,72	68	64
Economics, HRO	184	18,91	1,81	89	22
Art, Media, Design & Leisure Management HRO	24	22,33	2,73	58	67
Total	580	20,99	3,56	63	49

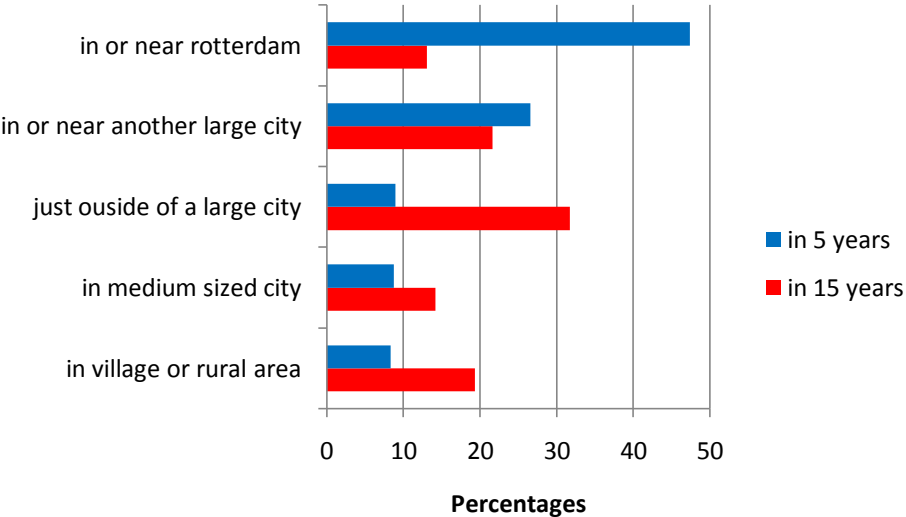
Among the variables that are intended to measure a general judgment of Rotterdam, we have a particular interest in two, as they will be used as the dependent variables in the logistic regressions. The first is: Would you recommend Rotterdam as a city to live? As can be seen in the figure below, 55% of the respondents state that they would indeed recommend Rotterdam as a city to live. More people would recommend Rotterdam as a city to work, as 80% of the respondents checked 'yes'.

Figure 11 - Recommendation results for Rotterdam as a place to live and as a place to work (N=574)



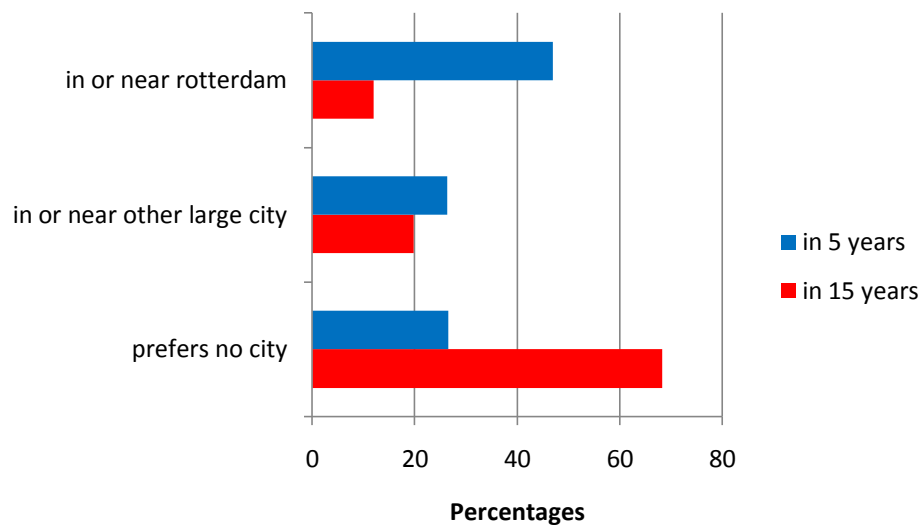
Another dependent variable that will be employed in the statistical analyses concerns the question where the respondent would prefer to live in five years from now. Five possibilities were presented and the results are shown in the figure below. Among the respondents, 47% prefers to live in Rotterdam in five years, 27% in another large city. The other categories are each preferred by less than 10% of the sample. Also included in the figure are the preferences of the respondents when inquired where they would prefer to live in fifteen years. A large shift is visible, as only 13% of the respondents prefers to live in Rotterdam in fifteen. Also other large cities lose when a longer term view is taken. We can see a large shift in respondents preferring less urban options.

Figure 12 - Where the respondent would prefer to live in five (N=481) and fifteen (N=444) years, in percentages: the original results



For the purpose of this study we are particularly interested in comparing Rotterdam to other large cities, as we aim to establish what attracts people to Rotterdam but also what Rotterdam lacks compared to other cities and thus what attracts respondent to other cities. The factors that attract people to less urban environments are factors that Rotterdam cannot supply, because it is a large city. Therefore, in the analysis, the three options ‘just outside of a large city’, in a medium sized city’ and ‘in village or rural area’ are aggregated to create a new variable: ‘prefers no city’. This variable includes not only the respondent who selected one of the abovementioned three options, but also the ones who selected a two of the three, or all three of those options (although in the questionnaire it was specifically stated that respondents should select **one** option). For five years, this moves creates more equal group sizes, which facilitates further analyses. The figure below presents the results in which the shift to outside city locations in fifteen years is clearly visible.

Figure 13 - Where the respondent would prefer to live in five (N=485) and fifteen (N=486) years, in percentages: the aggregated results



Amongst the other variables, there are some results that need to be addressed. The respondent rate the city of Rotterdam as a city for students with 3,63 (out of five) and a as city in general with 3,45. The most important two factors for the respondent in deciding for a place to live and work are the career opportunities and the quality of the accommodation. The access the leisure amenities is ranked lowest. Concerning the intangible aspects of the city Rotterdam is perceived as a vibrant city, and scores average on beauty and coziness. Safety and openness are negatively perceived. Amongst those, the respondents rank coziness and safety to be the most important factor for the overall quality of the city. As mentioned before, the complete overview of the descriptive statistics can be found in annex B. The chapter will now turn to the results of the logistic regression followed by the principal component analysis.

5.2. Binary logistic regression: Would you recommend Rotterdam as a city to live?

In order to come to a model which is capable of predicting whether the respondent would recommend Rotterdam as a city to live, a method was used which is comparable to a automatic backward stepwise regression method. Even though SPSS can perform such tasks, the criteria used by SPSS are debatable. Instead, a manual backward stepwise regression was performed. For the model refinement, we use a likelihood ratio test. In this test, a new model with or without an extra variable is compared to the original model based on the likelihood ratios (-2LL). The difference between the two ratios is chi-square and the difference between the degrees of freedom of both models is used to perform the chi-square test. This implies that if the resulting chi-square is larger than the critical value of chi-square (found in a chi-square table) for the corresponding degrees of freedom, the change is found to be significant. Working backwards, thus testing whether the drop of a variable would yield a significant change, a significant result would lead to the decision to keep the variable in the model as it contributes significantly to it. If a non-significant chi-square is obtained, the researcher concludes that the dropped variable does not contribute significantly to the model and to create a more parsimonious model, the variable can be dropped.

In the dataset, a model was created that contained all variables from themes ‘going out in Rotterdam’, ‘campus life’, ‘extra curricula activities’, ‘intangible aspects of Rotterdam’ and ‘decision location factors’. In addition three interaction terms were added between *live in Rotterdam* (whether the respondents lives in Rotterdam or not) and respectively *going out in Rotterdam* (how frequent the respondent goes out in Rotterdam), *Use of Campus Services* (how frequent the respondents uses campus services) and *Participate in extracurricular activities* (if the respondent participates in any extracurricular activities located in Rotterdam). The *gender* variable was also included. The so-called original model tested significant and its findings are reported in table 2 below. The next step was to identify the least significantly contributing variable (by looking at Roa’s coefficient and its significance), removing it from the model and running the same test again. The change in likelihood ratios (-2LL) and the change in degrees of freedom were analyzed to determine whether the new model significantly differed from the original. If not, the variable would remain removed, and a new least significantly contributing variable would be tested. If it would report significant, the researcher cannot discard the concerning variable as it significantly contributes to the model. This analysis was repeated multiple times until no variable could be dropped from the model without significantly worsening the model. This model is labeled as the *final* model (model 1a) and its results are also reported in the table below.

Table 2 - Model building results: binary regression backward stepwise

Model	N	-2LL	Df	Chi-square	R ² (H&L)	R ² (C&S)	R ² (Ngk)
Original	425	344,790	57	237,247***	0,59	0,43	0,57
Final	443	388,889	13	217,885***	0,64	0,39	0,52

Note: *** $p < 0,001$

In order to get to the final model, 120 different models were tested. The results from the final model are reported in the Table 3.

Table 3 - Model 1a: Manual backward stepwise constructed model, binary logistic

	B (SE)	95% CI for Odds Ratio		
		Lower	Odds Ratio	Upper
Would you recommend Rotterdam as a city to live (0=no, 1=yes) (N=443)				
Constant	-7,098 (1,006)***		,001	
Gender	-,367 (,280)	,400	,693	1,200
Live in Rotterdam (1)	2,136 (,759)**	1,913	8,467	37,477
Int: Live in R'dam*Going Out				
Live in R'dam (1) by Going out (1)	0,357 (,686)	,182	,700	2,685
Live in R'dam (1) by Going out (2)	-,277 (,702)	,192	,758	2,999
Int: Live in R'dam*Usage campus				
Live in R'dam (1) by Campus (1)	-,360 (,477)	,274	,698	1,778
Live in R'dam (1) by Campus (2)	-,655 (,527)	,185	,520	1,458
Quality of performing arts	,165 (,151)	,878	1,180	1,585
Openness	,371 (,158)*	1,062	1,449	1,976
Vibrancy	,725 (,174)***	1,469	2,064	2,901
Coziness	,404 (,162)*	1,089	1,498	2,059
Beauty	,834 (,157)***	1,694	2,302	3,129
Importance of safety	-,172 (,099)	,694	,843	1,022
Importance of neighborhood	-,207 (,100)*	,669	,813	,989

Note: $R^2=0,64$ (H&L), $0,39$ (C&S), $0,52$ (Nagelkerke). Model $\chi^2=217,885$, $p<,001$. * $p<,05$ ** $p<,01$ *** $p<,001$

Table 4 - Model 1a, classification table binary logistic regression

		Predicted outcome: <i>Rotterdam as a place to live?</i>		
		No	Yes	Percentage Correct
Observed outcome: <i>Rotterdam as a place to live</i>	No	151	42	78,2%
	Yes	41	209	83,6%
	Overall			81,3%

As noted earlier, all the variables in the model contribute significantly and cannot be removed on the criteria of the likelihood ratio test. This does not imply however, that each individual variable can significantly predict the outcome of the dependent variable. For the interpretation of the variables we look at the odds ratios. Among the significant predictors, *live in Rotterdam* has the largest effect on the outcome, as residents of Rotterdam are 8,5 times more likely to recommend Rotterdam as a city to live. When respondents evaluate Rotterdam positively on the level of openness, vibrancy, coziness and beauty, they are more likely to recommend Rotterdam as a city to live as the odds ratios all report above 1. However, if the respondent values the *importance of quality of neighborhood* highly in the decision on where to live and work, he is less likely to recommend Rotterdam as a city to live. Among the non-significant predictors are the interaction terms between *live in Rotterdam* and respectively *going out in Rotterdam* and *Use of campus services*. Also the importance of safety could not be removed from the model at any stage. In addition, the *quality of performing arts facilities* in the city appeared an important variable. An explanation for this

lies in the missing values. As a substantial amount of respondents did not fill in a response to this question, removing the variable would yield a higher N, resulting in a significantly higher -2LL value. To witness how this changes the model, the results are presented below as model 1b.

Table 5 - Model 1b: Manual backward stepwise constructed model, binary logistic

	B (SE)	95% CI for Odds Ratio		
		Lower	Odds Ratio	Upper
Would you recommend Rotterdam as a city to live (0=no, 1=yes) (N=505)				
Constant	-7,004 (.875)***		,001	
Gender (1=male)	-,347 (.262)	,423	,707	1,182
Live in R'dam (1=yes)	2,364 (.703)**	2,579	10,631	42,183
Int: Live in R'dam*Going Out				
Live in R'dam (1) by Going out (1)	-,757 (.638)	,134	,469	1,639
Live in R'dam (1) by Going out (2)	-,553 (.656)	1,59	,575	2,080
Int: Live in R'dam*Usage campus				
Live in R'dam (1) by Campus (1)	-,141 (.445)	,363	,868	2,075
Live in R'dam (1) by Campus (2)	-,451 (.498)	,240	,637	1,691
Openness	,365 (.147)*	1,080	1,440	1,920
Vibrancy	,760 (.163)***	1,554	2,138	2,940
Coziness	,313 (.151)**	1,124	1,513	2,035
Beauty	,909 (.147)***	1,862	2,483	3,310
Importance of safety	-,195 (.094)*	,684	8,23	,990
Importance of neighborhood	-,197 (.093)*	,684	,821	,986

Note: $R^2=0,63$ (H&L), $0,40$ (C&S), $0,53$ (Nagelkerke). Model $\chi^2=256,228$, $p<,001$. * $p<,05$ ** $p<,01$ *** $p<,001$

Table 6 - Classification table binary logistic regression, model 1b

		Predicted outcome: <i>Rotterdam as a place to live?</i>		
		No	Yes	Percentage Correct
Observed outcome: <i>Rotterdam as a place to live</i>	No	180	46	78,2%
	Yes	45	234	83,6%
	Overall			82,0%

Next to the change in coefficient sizes and odds ratios, the most noticeable difference between model 1a and model 1b is that the predictor *importance of safety* becomes individually significant at $p<,05$ level. It is a negative predictor, meaning that the higher the respondent evaluates the importance of safety in Rotterdam, the less likely one is to recommend Rotterdam as a city to live. Other changes that occur to the model by deleting the variable *quality of performing arts facilities*, are that the hit rate improves from 81,3% to 82,0% (as can be seen in the classification table), the model chi-square increases and the measure of R-square change, two positively (C&S and Nagelkerke) and one negatively (H&L).

Overall, from this analysis we can come to multiple conclusions. First, residents of Rotterdam are far more likely than non-residents to recommend their city as a place to live. Second, the higher respondents rate the city on beauty, vibrancy, coziness and openness, the more likely one is to

recommend the city. Amongst those, beauty is the most powerful predictor. Third, when a respondent values the quality of the neighborhood highly, it is less likely to recommend Rotterdam as a city. This implies that respondents do not associate high quality neighborhoods with Rotterdam, and if that is something the respondent aspires, it will not recommend Rotterdam. Fourthly, the importance of safety is also a negative predictor, although only found significant in model 1b, it suggests that when a respondent values safety in a city very important, it is less likely to recommended Rotterdam. In other words, if safety is important to one, Rotterdam cannot be recommend to live in. As a fifth, although the interaction are not found to be significant in either model, almost all carry a negative coefficient term. A negative coefficient implies that when the second term (*going out* or *usage of campus services*) increases, the non residents of Rotterdam are less likely to recommend Rotterdam as a city than the Rotterdam residents. A positive coefficient (as in model 1a for the interaction between *live in Rotterdam (1)* and *Going out (1)*), implies the opposite; when respondent increase *going out* from rarely to sometimes, non-residents become more likely to recommend Rotterdam. As such, going out sometimes instead of rarely has a larger effect on non-residents than on residents of the city. *Gender* also carries a negative coefficient and albeit insignificant, it suggests that men are less likely to suggest Rotterdam as a city to live.

It is also important to consider which variables did not make it through the model building phase. For one, it is remarkable to see that the *importance of safety* is found as a contributing variable but the rating of *safety* in Rotterdam is not. This can imply that whether or not one would recommend Rotterdam as a city to live does not depend on the actual level of safety, but rather on how important safety is to one. Also, none of the individual aspects of the themes *going out in Rotterdam* and *Campus life* were found as significant contributors. Recommending the city or not thus has little to do with campus life or the quality of leisure facilities in the city, but has more to do with the intangible aspects of the city such, as beauty, coziness, vibrancy and openness are found to be very significant contributors. All in all, the model is found highly significant, and hit rates as reported in tables 4 and 6 are reported above 80%, which also confirms the good fit of the model to the data.

5.3. Multinomial logistic regression: Where do you prefer to live in five years?

In comparison to the previous analysis, similar variables were used for this multinomial regression which included 350 cases without missing values. I extracted these to a separate dataset, to start the stepwise procedure. The results of the original model are reported in Table 7 below. In contrast to the binary regression, the multinomial regression does not calculate Roa's coefficient, but reports the likelihood ratio tests for the individual variables. As such, the least contributing variable can be identified and consequently be deleted from the model to test for the significance of their contributions. Similar to the binary regression, the change in likelihood ratios (-2LL) and the change in degrees of freedom were analyzed to determine whether the new model significantly differed from the original. If not, the variable would remain removed, and a new least significantly contributing variable would be tested. If it would report significant, the researcher cannot discard the concerning variable as it significantly contributes to the model. This analysis was repeated multiple times until no variable could be dropped from the model without significantly worsening the model. This model is labeled as the *final* model and its results are also reported in the table below.

Table 7 - Model building results: multiple regression backward stepwise

Model	N	-2LL	Df	Chi-square	R ² (C&S)	R ² (Ngk)	R ² (McFadden)
Original	350	446,111	112	288,317***	0,56	0,64	0,39
Final	350	547,614	26	186,814***	0,41	0,47	0,25

Note: *** $p < 0,001$

In 42 steps, a final model was created which has less predictive power than the original model, but is a far more parsimonious model. The results from the final model are reported in the table below.

Table 8 - Results multinomial regression

	B (SE)	95% CI for Odds Ratio		
		Lower	Odds Ratio	Upper
Prefers to live in other city vs. Prefers to live in Rotterdam (N=350)				
Intercept	9,795 (1,522)***			
Places to eat	-0,622 (,184)***	0,374	0,537	0,770
Imp of places to drink	-0,222 (,127)*	0,624	0,801	1,027
Campus leisure facilities	-0,624 (,183)***	0,374	0,536	0,768
Imp of campus access	-0,398 (,141)**	0,510	0,672	0,885
Coziness of Rotterdam	-0,665 (,181)***	0,361	0,514	0,733
Openness of Rotterdam	-0,474 (,186)*	0,433	0,622	0,896
Imp of leisure amenities	-0,036 (,122)	0,759	0,964	1,226
Live in Rotterdam	-3,277 (,854)***	0,007	0,038	0,201
Going out (often vs. rarely)	-1,645 (,773)*	0,042	0,193	0,879
Going out (often vs. sometimes)	-1,382 (,448)**	0,104	0,251	0,604
Extra Curricular Activities	0,513 (,370)	0,810	1,670	3,446
[theme1=0] * [theme2=1,00]	5,460 (1,209)***	21,970	234,980	2513,269
[theme1=0] * [theme2=2,00]	3,786 (,972)***	6,563	44,082	296,095
Prefers to live in neither city destinations vs. Prefers to live in Rotterdam (N=350)				
Intercept	4,258 (1,492)**			
Places to eat	-,417 (,196)*	,449	,659	,967
Imp of places to drink	-,318 (,130)*	,564	,728	,940
Campus leisure facilities	-,025 (,189)	,673	,975	1,412
Imp of campus access	,037 (,145)	,781	1,037	1,378
Coziness of Rotterdam	-,686 (,189)***	,348	,504	,730
Openness of Rotterdam	-,121 (,541)	,601	,886	1,306
Imp of leisure amenities	-,501 (,141)***	,460	,606	,799
Live in Rotterdam	-,090 (,699)	,232	,914	3,597
Going out (often vs. rarely)	-,974 (,982)	,055	,378	2,589
Going out (often vs. sometimes)	,102 (,607)	,337	1,107	3,641
Extra Curricular Activities	,817 (,344)*	1,153	2,264	4,446
[theme1=0] * [theme2=1,00]	3,621 (1,177)***	3,726	37,390	375,203
[theme1=0] * [theme2=2,00]	,816 (807)	,465	2,260	10,984

The results table is presented in two parts. The upper part compares the two groups *Prefers to live in Rotterdam in five years* and *Prefers to live in another large city*. The bottom part compares the former with *Prefers to live in neither city destination*. When interpreting the odds ratio's, it is important to note that it always relates to the reference group, in this case the group that prefers to live in Rotterdam. For example, if we look at *places to eat*, the higher the respondent rates this aspect of Rotterdam, the less likely one is to prefer to live in another city compared to Rotterdam, specifically, one is 0,537 times less likely. The other way around, increasing the rating for *places to eat* by one unit makes the respondent $1/0,537 = 1,862$ times more likely to prefer to live in Rotterdam versus another large city. Therefore, if the odds ratio is below 1, we label this a positive predictor as the respondent is more likely to prefer to live in Rotterdam than another city. Other positive predictors are *the importance of places to drink*, *the quality of campus leisure facilities*, *the importance of campus accessibility*, the rating for *coziness* and *openness* of Rotterdam, whether the respondent *lives in Rotterdam*, *goes out in Rotterdam* and the interaction between the latter two. Concluding, when the respondent lives and goes out in Rotterdam and has positive experiences in Rotterdam which shows in a positive rating for leisure amenities, one is more likely to prefer to live in Rotterdam.

Analyzing the bottom part of the results table, one must remember that these results show whether the respondent is more likely to prefer to live in neither city destinations compared to Rotterdam. The table shows that *places to eat* and *the importance of places to drink*, the rating for the *coziness of Rotterdam*, the *importance of leisure amenities* and one of the interaction terms between going out in Rotterdam and living in Rotterdam are all significant positive predictors. However, whether or not the respondent participates in extracurricular activities in Rotterdam appears a negative predictor, as the 'yes' group is 2,264 times more likely to prefer to live in neither city destination compared to Rotterdam. This is contradictory to the expectations, that the more a respondent is involved with the city, the likelier one is to prefer the city. Also interesting is that the main effect of *live in Rotterdam* is not a significant predictor, and neither is the main effect of going out. Perhaps one can conclude from this that the decision to live in a less urban environment in five year is not dependent on one's experience with the city. However, the affinity of the respondent with leisure amenities does contribute to the likeliness of preferring to live in Rotterdam.

Also important to analyze are the variables that were not significant contributors. Compared to the analysis concerning the recommendation variable, five variables 'lost' their significant contributions in the current model. The *usage of campus services*, *vibrancy*, *beauty*, *importance of safety* and the *importance of the quality of the neighborhood*. Apparently, these factors are important when it concerns the intention of recommending Rotterdam as a city to live, but not when the respondent considers places to live in the future.

The goodness-of-fit measures in the multinomial regression test whether the predicted values are significantly different from the observed values. As can be seen in the classification table below, the model predicts 69% of the values correctly.

Table 9 - Classification table multinomial regression

		Predicted outcome: <i>Where would you prefer to live in five years?</i>			
		Rotterdam	Other large city	Neither city destination	Percentage Correct
Observed outcome: <i>Where would you prefer to live in five years?</i>	Rotterdam	143	13	14	84,1%
	Other large city	20	54	17	59,3%
	Neither city destination	29	15	45	50,6%
Overall					69,1%

One can also look at the Pearson and Deviance statistics as provided by SPSS, they test for significant differences. A significance value higher than $p=,05$ indicates that the predicted values do **not** significantly differ from the observed values. In Table 10, the Pearson statistic reports significant differences whereas the Deviance statistic does not, although both aim to measure the same thing. A possible explanation for this is, as mentioned by Field (2009), is overdispersion (Field, 2009, p. 276). Overdispersion in the dataset can create the problem of making the standard errors too small, which would make the test statistics more significant than they ought to be, thus increasing the chance of making a Type I error. Whether or not the amount of overdispersion is problematic can be tested by dividing the chi-square by the degrees of freedom of both goodness-of-fit measures. The ideal value is 1 and values above 2 cause concern for

overdispersion. Testing this for both statistics yield values of 1,12 for Pearson's statistic and 0,77 for Deviance statistic. Both still relatively close to 1 so we can conclude that there is no reason for concern.

Table 10 - Goodness of fit measures multinomial regression

	Chi-Square	Degrees of freedom	Significance level.
Pearson	724,750	648	,019
Deviance	502,448	648	1,000

5.4. Binary logistic regression: Rotterdam or another large city?

The previous analysis stimulated interest to compare the two groups of 'city lovers', the respondents that prefer to live in Rotterdam with the respondents that prefer to live in another large city. Although previous regression also showed such results, building a model with comparing only these two groups can possibly yield different results. Similar independent variables were inserted into the model at the first stage of the analysis. The dependent variable, *Where do you prefer to live in five years* only has two values in this analysis, 0 for Rotterdam, and 1 for another large city. This approach limited the sample size, and using list wise deletion, 236 cases were incorporated. In table 11 the final results of the model building process are reported. In total, 204 different models were tested before the final model was reached. In table 12 the results of the final model are presented and table 13 shows the classification statistics.

Table 11 - Model building results binary logistic regression: "Where would you prefer to live in five years?"

Model	N	-2LL	Df	Chi-square	R ² (H&L)	R ² (C&S)	R ² (Ngk)
Original	236	142,028	56	165,264***	0,47	0,50	0,69
Final	236	202,442	11	104,850***	0,65	0,36	0,49

Table 12 - Results binary logistic regression: "Where would you prefer to live in five years?"

	B (SE)	95% CI for Odds Ratio		
		Lower	Odds Ratio	Upper
Where would you prefer to live in five years? (0=Rotterdam; 1=Another large city) (N=236)				
Constant	10,105 (1,747)***			
Live in Rotterdam (1)	-2,553 (,995)**	,011	,078	,547
Going out in Rotterdam (1)	-1,278 (,676)	,074	,279	1,048
Going out in Rotterdam (2)	-3,958 (1,079)***	,002	,019	,158
Live in R'dam (1) by Going out (1)	1,515 (1,094)	,533	4,550	38,803
Live in R'dam (1) by Going out (2)	5,577 (1,400)***	16,995	264,336	4111,373
Places to eat	-,813 (,226)***	,285	,443	,690
Leisure facilities at campus	-,663 (,206)**	,344	,515	,771
Importance of campus access	-,562 (,168)**	,411	,570	,792
Coziness	-,535 (,190)**	,403	,586	,851
Openness	-,651 (,205)**	,349	,521	,779
Importance of career	,380 (,140)*	1,112	1,462	1,922

Note: $R^2=0,65$ (H&L), $0,36$ (C&S), $0,49$ (Nagelkerke). Model $\chi^2=202,442$, $p<,001$. * $p<,05$ ** $p<,01$ *** $p<,001$

In the table above, eight different variables have a significant contribution in predicting the group membership of the respondents, whether they belong to the group that prefer to live in Rotterdam or whether they belong to the group that prefers to live in another large city. All variables except the *importance of career* are positive variables, implying that a higher value in the response correlates with a higher probability of preferring to live in Rotterdam. For example, a one-point increase in the rating for *places to eat* in Rotterdam corresponds with an increase of 2,25 in the likelihood of preferring Rotterdam. In contrast, when the importance of career is ranked with one point higher, the odds of preferring another large city increase with 1,462. Residents of Rotterdam report 12,8 more likely to prefer to live in Rotterdam after years, than non-residents. Also, when the amount of *going out* in Rotterdam is increased from 'rarely' to 'often', one is 5,26 times more likely to prefer Rotterdam. Other positive predictors are the *coziness*, *openness*, *leisure facilities at campus* and *the importance of campus accessibility*. In the classification table below, one can see that the model correctly predicts 80,1% of the group memberships.

Table 13 - Classification table binary logistic regression: "Where would you prefer to live in five years"

	Predicted outcome: <i>Where would you prefer to live in 5 years?</i>			Percentage Correct
	Rotterdam	Another large City		
Observed outcome: <i>Where would you prefer to live in 5 years?</i>	Rotterdam	134	18	88,2%
	Another large city	29	55	65,5%
Overall				80,1%

Concluding the logistic regressions, we can look back at the hypotheses that have been formulated in section tested in this research. They are discussed on at a time:

H1: Perceptions of aspects of life in Rotterdam have an effect on the general judgment on Rotterdam.

In the first binary logistic regression concerning the recommendation of Rotterdam as a place to live, we found that indeed perceptions of aspects of life are significant predictors of whether or not the respondent would recommend the city. In the second model, we see that only perceptions of the intangible aspects of Rotterdam are significant predictors. Apparently, respondents in their overall evaluation of the city as a place to live, weigh the intangible aspects of the city heavily. When analyzing where the respondent would prefer to live, the perceptions of coziness and openness of Rotterdam still hold. In addition, the perception of the quality of places to eat and the campus leisure facilities are found to be significant predictors. With these results we can accept the hypothesis that perceptions of aspects of life in Rotterdam have an effect on the general judgment on Rotterdam. More specifically, the perceptions of the intangible aspects of Rotterdam weigh heavily in the decision to recommend Rotterdam as a city or not.

H2: Personal preferences have an effect on the general judgment on Rotterdam.

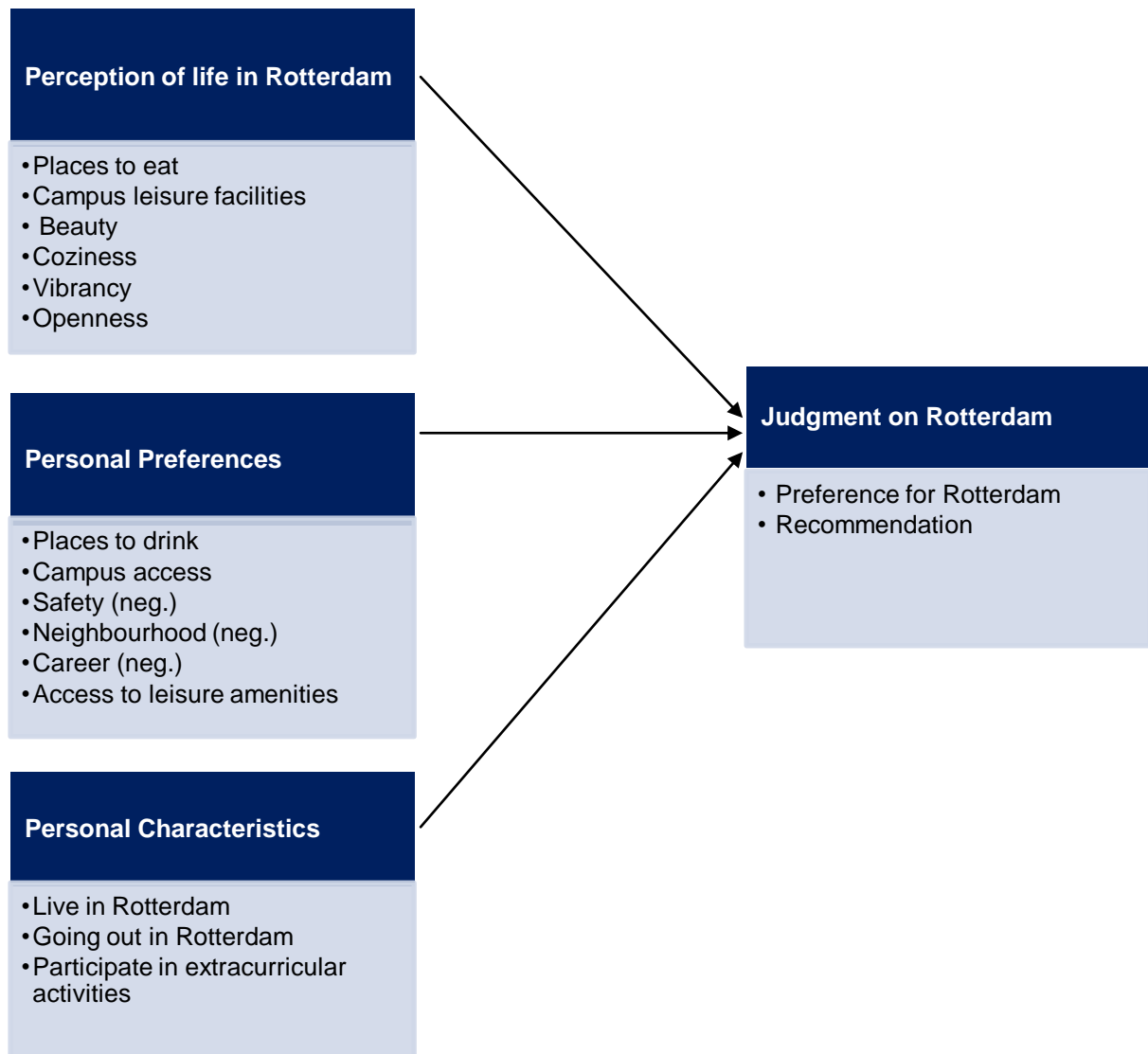
Concerning the first binary regression, we found that the preferences for the quality of the neighborhood as a location decision factor and the importance of safety for the overall quality of Rotterdam were significant predictors. Thus when it concerns the recommendation of a place to live, the respondent attaches value to the importance of safety and the quality of the living environment. In the multinomial regression, these aforementioned factors were absent. Instead, the importance of leisure amenities distinguishes city aficionados from respondents who prefer no city location. The importance of campus accessibility is a significant predictor when Rotterdam is compared to another large city. In addition, the importance of places to drink appeared to be a positive predictor in both comparisons. And in the final regression, the importance of career opportunities was found to be a negative predictor. Hence, we can accept that the hypothesis that personal preferences have an effect on the general judgment on Rotterdam.

H3: Personal characteristics have an effect on the general judgment on Rotterdam.

Living in Rotterdam, in all analyses, is a significant, powerful, and positive predictor. Rotterdam residents are thus more positive about the city than non-residents. Going out in Rotterdam also appeared in most analyses as a positive predictor. Respondents who go out more frequent are more likely to be positive about the city. Lastly, the participation of extracurricular activities was only found to be a significant positive predictor in one analysis. Concluding, we can accept the hypothesis that personal characteristics have an effect on the general judgment on Rotterdam.

On the following page, the conceptual model is presented with the significant predictors in the factors. The section on the logistic regressions is hereby concluded and the chapter will now turn to the factor analysis.

Figure 14 - Model with significant predictors (neg = negative predictor)



5.5. Factor analysis

From the above logistic regressions, we can observe that in the multiple analyses, similar variables stand out as significant contributors or predictors in the model. To recap the effects of the variables in the different analyses, Table 14 presents an overview of the individual effects of the independent variables. Please note that the effects are reported with respect to the opinion towards Rotterdam, therefore, although in the multinomial regressions, the coefficients report negative values, towards Rotterdam they are positive and thus are colored green in the table below.

Table 14 - Overview of individual effects in previous analyses

	Recommend Rotterdam as a city to live?	Rotterdam vs another city in multinom. regression	Rotterdam vs no city in multinom. regression	Rotterdam vs another city in binary regression
Gender				
Live in Rotterdam				
Going out in Rotterdam				
Usage of campus services				
Extracurricular activities?				
Places to eat				
Imp of places to drink				
Campus leisure facilities				
Imp of campus access				
Quality of performing arts				
Openness				
Vibrancy				
Coziness				
Beauty				
Imp of safety				
Imp of neighborhood				
Imp of career				
Imp of leisure amenities				

Note: Color coding: blue = positive; red = negative; grey: included in the model, but not significant individual effect; white = not in the model

As can be seen, some variables have significant individual effects in all analyses, such as coziness, or live in Rotterdam, and others have no significant individual effect at all.

To investigate whether there are underlying factors among these variables, a factor analysis was performed on all continuous variables that resulted from previous analyses as significant contributors. In the factor analysis, neither the categorical independent variables nor the dependent variables are included, as the researcher aims to find out if certain variables are measuring the same or similar items. Therefore, the factor analysis will only included variables belonging to the perception and preferences factors, as displayed in the model in Figure 14. The

independent categorical variables are not measuring opinions on the city of Rotterdam, rather reporting information of the respondent. Lastly, due to the disputable role of the variable *quality of performing arts*, which carries a substantial amount of missing values, it was not included in the factor analysis. Therefore, the factor analysis was performed on *coziness, vibrancy, beauty, openness, places to eat, the importance of the neighborhood, importance of career, importance of leisure amenities, importance of places to drink, importance of safety, quality of campus leisure facilities* and the *quality campus accessibility*.

A principal component analysis was performed on the 12 abovementioned continuous variables that showed to have significant contributions in earlier analysis. An oblique rotation (direct oblimin) was chosen as it allows the extracted factor to correlate with one another. The Kaiser-Meyer-Olkin measure testing the sampling adequacy for the analysis reported a value of $KMO=.672$, close to being ‘good’ (Field, 2009, p. 647). Bartlett’s test of sphericity reported significant with $\chi^2(66) = 807,168$, $p < .001$, proving that correlations between items were sufficiently large to conduct a factor analysis. The analysis extracted four factors with Kaiser’s criterion an eigenvalue above 1, which combined to explain 54,453% of the variance. The scree plot however shows two points of inflexion that could justify retaining 1 component or 3 components. However, given the large sample size and Kaiser’s criterion, it is preferred here to retain 4 components. The first component represents a positive attitude towards Rotterdam, component 2 represents a preference for practical matters and a sober lifestyle, component 3 a preference for career opportunities and the last component represent a preference for peace and comfort. Table 15 shows the summary of the exploratory factor analysis, the values in the table stem from the *structure matrix*.

Table 15 - Summary of exploratory factor analysis on selected variables (N=501)

Arial	Rotated factor loadings			
	Love for the city	Preference for practical matters, sober lifestyle	Preference for career opportunities	Preference for peace and comfort
coziness	,809	,120	-,060	,010
vibrancy	,768	-,149	-,062	,169
beauty	,738	,003	-,023	,025
openness	,682	,074	,054	,087
places to eat	,489	-,266	-,145	,306
imp neighborhood	,034	,225	-,811	,249
imp career	-,057	,140	,810	,210
imp leisure	-,108	-,556	,081	-,485
imp drinking	-,102	-,737	-,065	,113
imp safety	-,065	,097	-,127	,716
campus leisure facilities	,198	-,011	,111	,523
campus access	-,067	,476	-,078	,095
Eigenvalues	2,601	1,457	1,321	1,036
% of variance	21,677%	12,138%	11,008%	8,630%

To gain more insight into the components, it is interesting to know how many respondents can be characterized by a single component. In other words, we try to determine which component

best ‘matches’ the respondent. To determine their group membership, one can take two different approaches. The first approach is to see on which factor of the four, does the respondent score the highest. An advantage of this is that all respondents will belong to a group, but a disadvantage is that if the highest factor score is low, it does not really imply the respondent **belongs** to that group. Another approach is to analyze which respondents score one standard deviation higher than the mean, and as these are standardized values, with a mean of 0 and a standard deviation of 1, one can analyze which respondents scored higher than 1 on a certain factor. As a disadvantage, it is possible that respondents can score less than 1 on all factors, or more than 1 on multiple factors. This can limit the interpretation possibilities.

If we start with the first approach, we analyze the highest score of each respondent on one of the four factors, and subsequently determine its group membership. In that case, the respondents would be distributed as follows:

Table 16 - Distribution of respondents across factor groups, relative score driven approach

	Love for the city	Preference for practical matters, sober lifestyle	Preference for career opportunities	Preference for peace and comfort	Total
Amount of respondents	116	118	130	137	501
Percentage of total (N=501)	23,15	23,55	25,95	27,35	100

The respondents are quite evenly distributed across the four groups. The shares of respondents per group vary between 23% and 28%. In the second approach the allocation of group membership is different, as presented in the table below.

Table 17 - Distribution of respondents across factor groups, absolute score driven approach

	Love for the city	Preference for practical matters, sober lifestyle	Preference for career opportunities	Preference for peace and comfort	Total
Amount of respondents	80	85	89	79	333
Percentage of total (N=501)	15,97	16,97	17,76	15,77	66,47

Similar in the second approach, the distribution of the respondents is quite even across groups, as the shares of respondents vary between 15% and 18%. However, as previously mentioned, in the latter approach it is possible for respondents to score higher than 1 on multiple factors and thus being counted double. In the analysis, 45 respondents score higher than 1 on two factors, and 9 respondents scored higher than 1 on three factors. Only 216 respondents scored higher than 1 on one factor.

Now that we have learned that there respondents can be distributed among the four extracted factors, it is interesting to further analyze these factors. Therefore, the factor scores of each respondent on the concerning factors were saved, and a correlation analysis was performed with all the other variables. This step is ambiguous, as the components extracted result from the

variables gained from previous analysis, and now the scores on the components are checked for correlation with previously emitted dependent and independent variables. Nevertheless, the purpose of this analysis is to gain more insight into the data and to see if the components labels are consistent with future findings. The results from the correlation analysis are presented in Table 18 which is included in annex C. The darker colors represent larger correlations ($r > .3$), the lighter colors smaller correlations ($r < .3$). If the cell lacks color, the correlation is not found to be significant. Red colors show a negative correlation, green colors a positive correlation. Only the correlations between the factor scores and the variables that were **not** employed in the factor extractions are shown.

Discussing this table will be done by interpreting the correlations per component. Furthermore, the additional information on the components is used to create new group labels. Therefore, we start with the Rotterdam Lovers.

Component 1 - Rotterdam Lovers: This group represents the most positive respondents. Even though they are not significantly more from Rotterdam, they do significantly go out more in Rotterdam, and participate in extracurricular activities. They are strongly positive about the city. They rate the aspects of going out in Rotterdam more positive than others, but value the importance of place to drink significantly less. They are also positive about the facilities at the educational institutions. Furthermore, although they rank the extracurricular aspects of the city positively, on the importance of student associations they are quite negative. From the component extraction we have learned that this group is highly positive on Rotterdam in terms of beauty, coziness, vibrancy and openness. Table 18 also shows us they are positive about the level of safety in Rotterdam, although they attach little importance to it. In deciding where to live, the quality of the accommodation is more important than it is to the other groups. Lastly, they prefer to live in Rotterdam in five years and strongly dislike the other two options.

Component 2 - Campus visitors with preference for practical matters: The respondents among this group are significantly less from Rotterdam, and also go out less in Rotterdam. They are quite negative on the overall judgment on the city. Although they attach a high value to the importance of shopping and transport in the city, they rate quality and the importance of places to drink negatively. From the component extraction we learned that this group correlates highly with a stated preference for campus accessibility. However, they are negative towards the importance of leisure facilities and atmosphere. but attach a high value to the importance of campus access. Also in the component extraction, this factor correlates slightly with the importance of quality of the neighborhood and the career opportunities in deciding on where to live, of which they currently state that they prefer to live outside large cities.

Component 3 - City lovers with career orientated attitude: The next group that is distinguished correlates positively with living in Rotterdam and usage of the campus services. This is surprising, as this group does not prefer to live in Rotterdam in five years. Perhaps because they use campus services significantly more, they rate the quality of the study and leisure facilities at campus higher, and also attach value to the importance of the former. A significant correlation with the quality and availability of student associations was found. Among the intangible aspects of Rotterdam, they are more positive about the level of safety than others. This

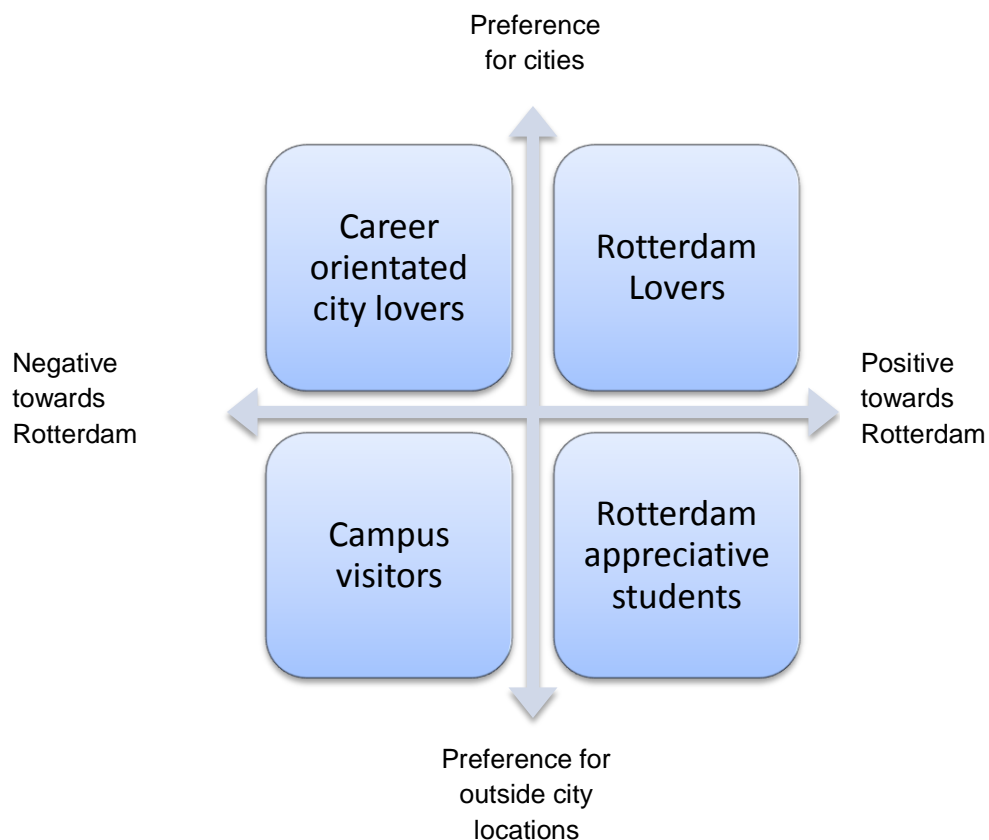
group is the only group that values the importance of vibrancy for a city significantly higher. From the principal component analysis we learned that in deciding for a place to live and work, this group shows a highly negative correlation with the quality of the neighborhood, but a highly positive correlation with career opportunities. In addition, they are found to care less about the quality of quality of accommodation. In five years from now, this groups significantly prefers to live in another large city.

Component 4 - Rotterdam appreciative students with preference for rural comfort

This group is represented by significantly more women than men. The respondents go out in Rotterdam less often than others. Nevertheless, they are quite positive on the city in their overall judgments. They are positive on almost all aspects of going out in Rotterdam, campus life, and extracurricular activities. Although they rate Rotterdam positive in the level of vibrancy, they do not regard it as an important aspect of a city. Rather, in the component extraction we saw that safety is considered to be most important for this group. Among the factors that play a role in deciding where to live, they are similar to group 2, positive on the importance of the quality of accommodation and neighborhood and negative on the importance of leisure. They significantly dislike the option to live in another large city in five years, but prefer to live outside a large city.

To recap the factor analysis, as a first step, the variables that showed to be significant contributors in previous logistic regressions were gathered and the continuous independent variables were subjected to a principal component analysis with a orthogonal rotation. Based on Kaiser's criterion, four factors were obtained. We analyzed the factor scores of each respondent to determine its group membership in two different manner. The groups seemed evenly distributed across the sample of 501 students, irrespective of the counting methods. Afterwards a correlation analysis was performed with the factor scores and the remaining variables which were not used for the factor analysis. This yielded additional insight of the respondents profiles. Four groups can be distinguished: Rotterdam lovers, Campus visitors, Ambitious city lovers and Rotterdam appreciative students.. These four groups can be distinguished on two variables. The first is a preference for cities and the second is a positive attitude towards Rotterdam. The counter parts of these are a preference for outside city locations and a negative attitude towards Rotterdam. In a graph, the two variables make up for the x and y-axis, in which we can plot the four groups extracted from the factor analysis. This is graphically presented in figure 15 below.

Figure 15 - Graphical representation of the four groups



With this, we have arrived at the end of the results chapter. An overview of the results is presented in the next chapter, after discussing the limitations of this study. Furthermore in the discussion, policy implications will be addressed also according to the abovementioned four groups, as with the information we assembled, we can formulate tailor-made policy. Lastly, the implications for further researched will be addressed.

6. Discussion

In this chapter the following will be discussed: First, the chapter will discuss some of the limitations of this research. With the limitations of the research in mind it discusses the results of the statistical analyses secondly. The third part of this chapter focuses on the implications of this research for policy makers. Herein, different policy approaches are discussed aimed at the different groups among the student population after which three recommendations for policy makers are proposed. Lastly, the implications for further research will be addressed.

6.1. Limitations

Before we can address the results of this study, it is wise to consider its limitations. Firstly, one of the major limitations is that this research cannot show what influences the perception on the city. The research can show what correlates with perceptions of the city, and which factors are powerful predictors in this relationship, but it fails to add understanding to how perceptions in the mind of the population are influenced. Hence, the question of causality remains unanswered in this study. Furthermore, the relations between the independent factors in the model have not been a central theme in this study, but could provide more insight into the model.

Another limitation of this study is that it concerns stated preferences instead of revealed preferences, as often used by urban economists. This is because this research focused on the effect of characteristics, perceptions and preferences of students on their willingness to recommend and live in Rotterdam. However, we will never know if the students who stated to recommend Rotterdam as a city to live, or stated to prefer to live in Rotterdam in the future, actually live up to their intentions. This knowledge would provide insight on the influence of perceptions and preferences on actual location behavior. This however, is beyond the scope and possibilities of the present research.

Furthermore, we should be careful with generalizing these results over the total student population. This is because firstly, the sample was not randomly selected. The choice of class distribution and the dependence on the willingness of professors and lectures limited this. Efforts were made to obtain questionnaires from different faculties and different age groups, but are not enough to guarantee the ability to generalize the results. Second, the sample collected consisted of 580 respondents. For the regression and factor analyses, even less respondents were used. Considering that there are about 60.000 students enrolled in higher education in Rotterdam this leads to a sample size of less than 1% of the population. Surely, the results of such a small sample are harder to generalize over the total population. In addition, the sample contains over 67% of students that are enrolled in a program within the field of economics. This could also have had an effect on the results.

Lastly, there are some issues with the data. The choice to only let Rotterdam residents fill out the aspects on their direct living environment led to the decision to omit these variables from the logistic regression as it employs a list wise approach. The reason for this was that this research is interested in the perception of the quality of accommodation and the neighborhood in

Rotterdam, and not so much of any other place in the Netherlands. However, due to limited data sample, it was decided to not include the dwelling specific indicators in the research. This is unfortunate, as it has been argued before that they could have an effect on the overall perception of the city and the stated future location behavior. Furthermore, the subjective nature of variables concerning the frequency of going out in Rotterdam and using campus services should also be taken into account when generalizing the results. Although overall, it is believed that the respondents have more or less a similar frame of reference when answering these questions. Lastly, whether or not a person lives in Rotterdam does not necessarily imply that one is very experienced with the city. Among the residents might be respondents who just moved into Rotterdam or have lived in Rotterdam all their life; the questionnaire does not allow for a distinction. To further test for the effects of experience with the city on the overall judgment on the city, the duration of residency in Rotterdam should be analyzed.

6.2. Discussion on the results

In the literature, we analyzed why cities should focus on the young and highly educated population to stimulate their local economy. Highly educated people are endowed with a high level of human capital which is found to be the main driver for urban economic growth. In addition, as moving probabilities decrease for the individuals after the age of around 25, the highly educated people are most easily attracted around that age, and the probability of losing them as a city, decreases with time. This research therefore aimed to answer the question: How can Rotterdam attract and retain the young and highly educated population? For this we needed to analyze how the student population viewed the city, and which factors influence the respondent's opinion. The questionnaire was designed to analyze the effect of perceptions, preferences and characteristics on the general judgment on the city.

The results of this study show that perceptions, preferences and personal characteristics have an effect on the overall judgment of Rotterdam. The formulated hypotheses in section 4.5 were confirmed in the results chapter. In this section, the specific results will be interpreted and viewed in the light of previous literature on the subject.

One of the major contributions of this study is that it shows that the young and highly educated population is diversified when it concerns personal perceptions, preferences and characteristics. In previous research, the highly educated population has been treated as a homogeneous group, with similar preferences and attitudes. However, the factor analysis shows that among the young and highly educated population, different groups can be identified, and these groups have different preferences concerning their aspired living environment and different perceptions concerning the aspects of life in Rotterdam. For example, in the analysis which aims to find out which factors can predict whether or not the respondent would recommend Rotterdam as a city to live, the importance of safety to the respondent is found to be a negative predictor and furthermore, the factor analysis showed that the respondent who value the importance of safety high, also prefer outside city locations as a place to live in the future. Hence, the notion that the young and highly educated are drawn to urban environments does not apply to the total population. Results have shown that there are groups among the population who prefer urban environments as places to live, but there are also groups that prefer safer environments, often

found in outside city locations. The concept that the young and highly educated population is diversified is perhaps overlooked in policy and research. This research offers therefore a new perspective on the young and highly educated population.

When we look back at the regression analyses and the individual predictors specifically, one of the important conclusions is that living in Rotterdam correlates with a positive general judgment of Rotterdam. This is important as it increases the chances of retaining population which has made the decision to live in Rotterdam. If this correlation would be negative, thus that residents are negative about Rotterdam, the city would experience much more difficulty retaining the young and highly educated people, especially as cities are competing for residents (Braun, 2008; Marlet, 2009). The fact that residents are more positive about the city is therefore a vital result for the city of Rotterdam.

However, how the respondents come to 'like' the city is not clear. The first lesson in statistics, that correlation does not imply causation, needs to be remembered when interpreting these results. It is possible that residents, because they know the city better, have a more positive view on the city. It could also be however, that respondents who have a positive view on Rotterdam, move to Rotterdam, and following state their positive view in the questionnaire. Another mechanism could also be that people have a desire to confirm their choice to live in Rotterdam, even though their view might have turned more negative. To justify their choice, they are biased to respond positively on the questionnaire. This could also have an effect on the data. Furthermore, this scenario could also increase the gap between stated preference and revealed preference. Although they would state that a positive opinion, they could reveal negative behavior: the worst case scenario, leaving Rotterdam. The process of 'liking' Rotterdam is an interesting and relevant topic for further research.

A second important result is that *going out in Rotterdam* is positively correlated with the general judgment on Rotterdam. Similar to *living in Rotterdam*, the causation is unclear. It could be that respondents like the city and therefore choose it as a place to go out, or it could be that the more the respondent goes out in Rotterdam, the more the respondent likes Rotterdam. Nonetheless, the important conclusion from this result is that *going out in Rotterdam* plays a large role in the judgment on the city for the student population. This result is in line with the findings of Clark (2003), who shows that recent graduates in the United States are attracted to cities with a high supply of *constructed amenities*, as discussed in section 3.4. In the questionnaire, the theme *going out in Rotterdam* aimed to address these amenities and the question how frequent the respondent would 'consume' such amenities is measured by inquiring 'how often do you go out in Rotterdam'. The population that consumes these amenities at a higher rate is more positive about the city than the population who consumes these amenities at a lower rate. In comparing a young population with an old population, Clark (2003) shows that the young are attracted to the constructed amenities. This research however, shows that within the young population, there are also significant differences. Among the variables of the concerning theme, the importance respondents attached to *places to drink* in Rotterdam, was found to be significant positive predictor. In other words, people who prefer places with a quality supply of places to drink are more likely to prefer to live in Rotterdam, even compared to other cities. Rotterdam is perhaps perceived by the student population to have a quality supply of places to drink, which is

important to their future location decision. Furthermore, the perception of the *places to eat* in Rotterdam also appeared a powerful predictor for where the respondent prefers to live in the future. In the literature research, we saw that previous authors, in analyzing the attractiveness of cities use proxy's of the culinary quality (in Marlet, 2009), the amount of restaurants (in Glaeser et al, 2001) as predictors for urban attractiveness. This result suggest that next to the 'objective' indicators, the perception of restaurants in Rotterdam plays a significant role in the location decision. The population who has a positive perception on the restaurant in Rotterdam are more likely to prefer to live in Rotterdam in the future than the population which has a negative perception on the restaurants in Rotterdam. The perception of Rotterdam restaurants therefore has a share in the overall judgment on the city.

The importance of campus accessibility correlates positively in two regression analyses comparing Rotterdam versus another city. However, from the factor analysis we can conclude that the population which is significantly less represented by residents of Rotterdam, attach higher values to the importance of campus accessibility than the other groups. These two results might seem contradicting. On the one hand, people who prefer to live in another large city in the future *do not* care about campus accessibility, but the people who live outside of Rotterdam now, *do* care. It could be that in five years from now, the students have graduated, and once they choose not to live in Rotterdam, they have no reason to come back to campus again. But at the moment, campus still needs to be accessed almost on a daily basis, therefore, there are plenty of people living outside of Rotterdam who do care about campus accessibility.

The perception of the intangible aspects of Rotterdam have a positive correlation with the general judgment on Rotterdam. Especially *coziness* was found to be a powerful predictor in all regression analysis. Although Rotterdam is perhaps sometimes viewed as a 'cold' city, this results shows that the Rotterdam in fact is regarded by a share of the respondents to have a cozy atmosphere and that *coziness* is an important factor in the overall judgment on a city. It is in contrast with the beliefs of Marlet (2009) who suggests that old historical buildings contribute to a beautiful city and a cozy atmosphere. Rotterdam, a city with a small share of historical buildings (Marlet, 2009), is nonetheless perceived by some as a beautiful and cozy city. Openness is also found to be a significant positive predictor in multiple analyses, which is in line with the theory of Florida (2002) which suggest that the creative class is drawn to tolerant places, open for other people. And as we have seen, the creative class and the highly educated are often the same people, and drawn to similar aspects of cities. Openness is important in the overall judgment on Rotterdam for the young highly educated population. Relating these results to previous research, it is remarkable to see the importance of the perception on the intangible aspects on the general judgment of the city. Urban economists have traditionally opted for factual proxy's to determine a city's attractiveness, but the intangible aspects, determined in the minds of the population, appears to be of vital importance.

Another important conclusion can be drawn when we take a look at the variables that did not make through the stepwise regressions. Neither, the perception of the quality of the majority extracurricular activities, such as sports facilities, students associations and students, nor the importance of these factors correlate significantly with the general judgment on Rotterdam. To find an explanation for this we can adhere to the definition of urban amenities. In the literature

section we discussed that urban amenities, which have an influence on the urban attractiveness, are *location bound*. Glaeser et al. (2001) also argue that the amenities that have an influence on population growth are the amenities that are not easily copied. Bowling alleys for example, they argue, are easily copied, and thus do not have a defining effect on the attractiveness of a place. The same reasoning can be applied to the extracurricular activity factors. Sports facilities are not only easily copied, but the majority of sport facilities (gyms, sports fields, indoor sports arena's) are found in small market areas as well as in every large market area. Also the importance of sports facilities was not found to be significant, which indicates that among the student population, Rotterdam is not a preferred city because of its sports accommodations. The same holds for student associations which can be found in other university cities in the Netherlands, and the supply of student jobs. Moreover, the perception of places to shop also was not found to be significant. Perhaps a similar mechanism applies, as the shopping streets in the Netherlands offer similar shops.

Concluding, there are three major results of this research. First, experience with life in Rotterdam correlates with a more positive judgment on the city. As we will see, this has implications for the policy makers of Rotterdam. Second, the student population is a diverse group with difference perceptions and preferences. Third, the intangible aspects of the city appear important predictors. The aspects of Rotterdam that are easily copied or can be found elsewhere are found to have no significant effect on the judgment on the city.

6.3. Implications and recommendations for policy makers

In this section, it is discussed what the implications of the research results *could* have on future policy. Afterwards, three recommendations are presented on what, according to the results, the policy makers *should* do.

6.3.1. Implications of research results for policy makers

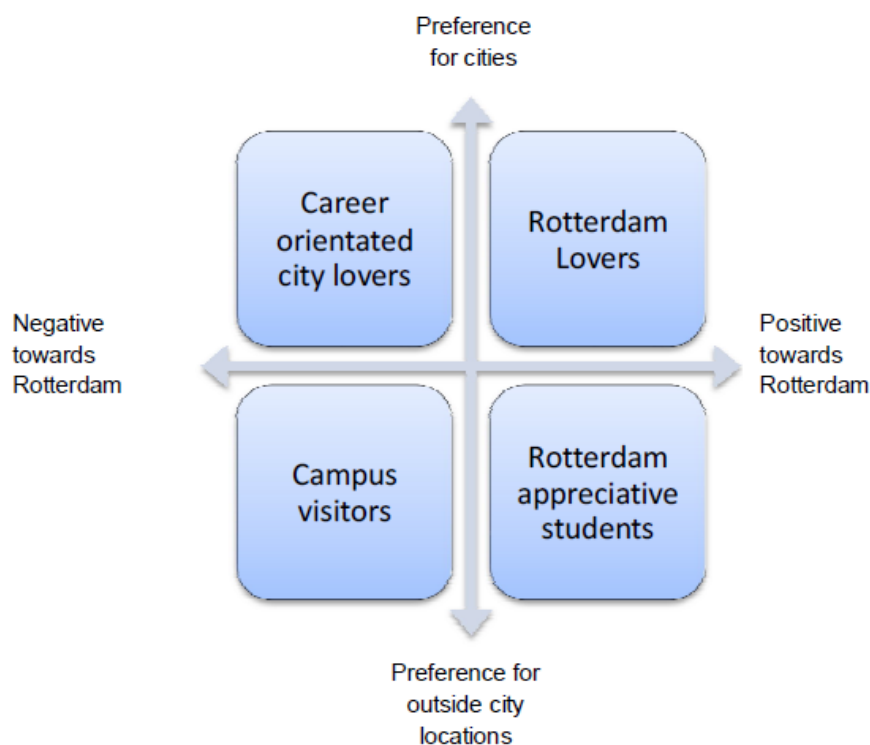
The central question of this research is how can Rotterdam attract and retain the young and highly educated. The university is large source for young and highly educated people, but the city experiences problems in attracting and retaining highly educated people, and people in the age group of 25 to 30. The Economic Development Board of Rotterdam initiated in 2006 the program Rotterdam Student City with the aim to improve Rotterdam's capabilities to attract and retain the highly educated students. The program ended in December of 2009. Although this program focused on a very specific population, the factor analysis taught us that the student population is diversified with different preferences and perceptions. This section which will discuss the implications for the policy makers and will use the diagram presented below to discuss which measures should be used to attract which groups. But before we turn to policy recommendation for the specific groups, I wish to discuss the implications of one vital result of this study for the future of policy efforts.

Respondents with more experience are more positive

Among the student population, the respondents who have more experience with the city are also more positive about the city and are more likely to prefer to live in Rotterdam in the future. For policy makers this is a positive result as it increases the chances of retaining the student once attracted. It also justifies the efforts taken by policy makers to attract the young and highly educated, for example the program of Rotterdam Student City and RotterdamLife. The ability to retain the student after attracting it, makes the effort of attracting worthwhile. This is a vital conclusion for the policy makers. Efforts to attract students should therefore be stimulated as this research proves the positive effects of experience in Rotterdam on the general judgment on the city.

Furthermore, as people are most likely to move into Rotterdam in the age group of 20-25, promotion efforts for living in Rotterdam should not only be done at the introduction days when a student experiences his first days of his student life, but also later, as many students at first might not be 'ready' to live independently. The students at the HBO institutions are one year younger. Therefore also later in their educational career should Rotterdam students be informed about the possibilities and benefits of living in the city. Furthermore, students at all ages should be encouraged to go out in the city as it has been found a powerful predictor.

To discuss the policy approaches for the different groups identified by the factor analysis, the figure from the results chapter is once again presented below.



Group 1: Rotterdam lovers

As we have seen, this group is highly positive about the city, thus they do not require much convincing in order to attract them to the city. What this groups requires is opportunity. This group is not significantly more represented by residents of the city as can be seen in the correlation table presented in annex C. Perhaps among this group, there are people who would like to live in Rotterdam but cannot find the appropriate accommodation. Reports from the Student City Program also note that there is a shortage of student accommodations in Rotterdam. Indeed this group attaches significantly more value to the importance of accommodation, and this could be a reason why a part of this population has not yet moved to Rotterdam. But in addition to supplying more student rooms, there should also be a quality supply of accommodation for the recent graduate or starting professional. This also facilitates the flow among inhabitants of student dorms. Furthermore, the benefits and opportunities about living in Rotterdam should be actively promoted in student circles. An internet website with promotional videos are in my view not enough. Representatives of a 'student housing organization' should be active on the campus in promoting the city of Rotterdam. Furthermore, there could be an office located on campus Woudestein which assists students in finding accommodation in the city and supplies information about the benefits and opportunities of living in Rotterdam.

Group 2: Career orientated city lovers

This group, although living in Rotterdam, has a preference to live in another large city. Presumably because this group attaches much importance to career opportunities in deciding where to live in the future. During the Student City initiative, private partners were reluctant to invest time and money in programs that encourage students to do an internship at one of the firms while living in Rotterdam. As a reason, the firms pointed to the poor economic climate and the shortages on the job market. Nevertheless, such a design could form a unique opportunity to bond this specific group, which is very career orientated. Next to internship possibilities, the policy could also include benefits for starter jobs in Rotterdam. However, as accommodation is not the problem for this group, and they do not attach importance to the quality of their neighborhood, perhaps the policy makers should focus merely on sponsoring internship possibilities in the public and private sector. When policy makers want to stimulate Rotterdam students to find a job or internship at Rotterdam based companies, incentives can be provided to both sides. For example, a company could get receive a benefit when Rotterdam based students are admitted to an internship, and even a larger benefit when a starter contract is offered. On the other hand, the students can also be provided with incentive to look for a job or internship in Rotterdam by attaching financial incentives or housing incentives.

Group 3: Rotterdam appreciative students

In this group, the population significantly goes out less in Rotterdam compared to the other groups. But besides that, they are generally quite positive on Rotterdam. This group is harder to attract as they show a preference for outside city locations as a place to live in the future. This preference is accompanied by a high value for the importance of safety and quality of the neighborhood as a factor in location decisions. If Rotterdam aims to attract this group it must be able to provide safe, green and spacious neighborhoods, something that is often not found for a student or starter budget. The creation of apartment complexes to accommodate such a need

requires large investments. Nonetheless it must be recognized that also students value the importance of a safe environment. However, there is a positive correlation between the perception of safety in Rotterdam and whether or not the respondent lives in Rotterdam. It could be that residents who have more experience with the city, also feel more comfortable and more safe in the city. This cannot be said with absolute certainty from these test, but it seems reasonable. In such case, one would encourage the student population engage in more social activities in the cities. The student associations could be involved in this. Although they arrange the introduction week festivities for the new students each year, they should also be encouraged to organize smaller scaled activities in inner city locations more frequently, and not only targeted at first years, but also at older students. Furthermore, the educational institutions could help 'bring' the student into the city by locating lectures, classes, ceremonial events in the city centre on a more frequent base. This could stimulate the students to go out in Rotterdam and experience the city. The efforts by Rotterdam Student City, and RotterdamLife are good contributions in communicating life in Rotterdam. However, this research shows that experience is a vital key for the perception on the city and therefore a more practical approach might be preferred. Incorporating student associations in getting more students into the city should be the aim. Furthermore, I suggest small scale efforts. This could contribute to the perception of coziness and facilitate the visits of the 'small amenities' Florida and Jacobs so highly praised for stimulating the exchange of knowledge.

Group 4: Campus visitors

This group is the hardest to attract, and policy makers should consider carefully whether or not to aim their efforts at them. This group has a strong preference to live in outside the city locations, and has a negative opinion about the city of Rotterdam and other aspects of the city. They live significantly less in Rotterdam and also go out less in Rotterdam. My policy advice is to admit that not all students can be attracted.

As I have mentioned before, the population of the young and highly educated is diverse. Efforts taken by the policy makers should be focused on the population which can be gained most easily against low costs. A difficulty in such strategy is how can policy makers identify which individual belongs to which group. One can look at the personal characteristics of the population. The group of the career orientated students for example is represented by the people who use campus services significantly more than the other groups. Specific marketing efforts directed at them should thus take place at the educational facilities. The groups that have been distinguished have different perceptions and different preferences. As in all marketing strategies, one must know who its target audience.

Intangible aspects

Previous marketing strategies of Rotterdam have aimed to create a daring image of Rotterdam by employing a slogan (the slogan: "Rotterdam Durft", in English: "Rotterdam Dares"), and organizing large thrilling events (such as the Red Bull Air Race, or Bavaria Street Races). In this research, we have seen the importance of *coziness* as a factor in the overall perception of the city. Respondent who regarded the city as having a cozy atmosphere were much more likely to live in Rotterdam in the future and would recommend it to friends. Rotterdam thus has a cozy side, although this is in contradiction to most portraits of city. The marketing efforts of Rotterdam

have done nothing to suggest otherwise. Perhaps a change in approach could benefit the ability of the city to attract the young and highly educated population. Presenting the city as a place with a large supply of small amenities and a safe, open, and cozy environment could benefit the city's ability to attract the young and highly educated as these items appear important. Therefore I recommend a change in the marketing approach of the city which targets potential residents.

6.3.2. Recommendations for policy makers

To attract and retain more young and highly educated people, three recommendations are proposed:

1. Acknowledge that the student population is heterogeneous, and design different strategies for different groups.

As we have seen, the student population is diverse with different preferences, perceptions and characteristics. In designing policies, this should be recognized in order to increase the effectiveness. In addition, further research should be conducted to monitor these groups. Are they constant over time? Do they hold for larger sample sizes? How likely are students to 'switch' groups? These are aspects that need to be investigated before one can fully commit to specific marketing.

2. Do not stop student initiatives, rather expand.

Experience in Rotterdam was found a strong predictor for the preference to live in Rotterdam in the future and the recommendation to friends as a place to live. Therefore, the programs started by the municipality are justified and should be stimulated to continue. However, as mentioned before, different parties should be included such as the private sector, student associations and student housing corporation. RotterdamLife, an initiative to enhance the experiences of Rotterdam for young professionals, provides information about living, working, studying and going out in Rotterdam. To increase the effectiveness of their efforts, a RotterdamLife office could be installed on campus Woudestein. There, students can talk to ambassadors of RotterdamLife who can inform them and entuse them about life in Rotterdam. Furthermore, the office can function as information link for the involved partners. Thus from the private sector, there is information on available jobs or internships, from the housing corporation there is information about the available accommodation and from the student associations there can be information about social activities in the city. To attract people to the office, it could take the form of a "coffee+info" stand, where coffee and hot beverages are sold. Combining the interests of the parties involved, and presenting it as a total package on location, could increase the effectiveness of the existing initiatives.

3. Market the city to the young and highly educated with an emphasis on coziness.

From the results, we can conclude that the perceptions on the intangible aspects of the city have a large effect on the overall judgment on Rotterdam. Especially coziness and openness appear powerful predictors. Therefore, the city should focus on presenting their cozy sides and its open environment to the target population. The RotterdamLife

initiative can play a role in this. Ambassadors of the city should not only promote their city online, but should also engage in the social activities at campus Woudestein. In addition, the city could shift their focus from organizing large scale thrilling events to organizing more social, cultural and small scale events. The events can take place in the small amenities of the city, such as bars, cafés and restaurants and can be co-organized by the student associations. Activities and promotional campaigns can enhance the students' perception of the social atmosphere in Rotterdam.

6.4. Implications for further research

The limitations of this research automatically provide suggestions for further research. Further research should aim to get a better representation of the student population, to investigate whether the results can be generalized to total student population. Improved indicators can be employed to avoid the subjective nature of certain variables. In further research it should also be aimed to include dwelling specific indicators in the statistical analysis.

Furthermore, although this research focused on stated preferences and intentions, further research could include analyses of revealed behavior, in relation to the perceptions and preferences of the population. This could add to the existing literature on the attractiveness of cities in providing a deeper understanding spatial location decision making process. One of the ways to investigate such, is to conduct a similar research as the one at hand, but adding a follow-up study where the respondents are contacted five years later to inquire about their spatial behavior, factors that were most important to them in their decision making process, and about their perceptions. As such longitudinal studies are costly and difficult to manage, two representative samples of the student population and the alumni population could also be compared. Another aspect that further research could focus on are the relations between perceptions, preferences, characteristic and the causality on the overall judgment on the city. This research cannot show evidence of causality, but the understanding of causal relations in the conceptual model would benefit the conclusions of this research and make it easier for policy makers to concentrate their efforts.

This research focused on the situation of Rotterdam, but it would be most interesting to investigate whether similar results hold for different student city's. For example, Amsterdam scores best in attracting the population of the age between 25 and 30. Are their perceptions on the city of Amsterdam significantly more positive than perceptions of Rotterdam? Do people who move to Amsterdam have similar preferences? Can similar groups be identified among the student population in Amsterdam? A comparative study between student populations from different cities could provide answers to these questions, but also in more general terms, determine whether these relations are city specific, or can be generalized across multiple cities. Furthermore, follow-up studies could reveal 'movement' or the lack thereof, across groups. Can students who belong to one group over time change groups? Is there a pattern visible among students over time? Policy makers could use this information should sharpen their initiatives. Research can also focus on when in the students' educational career, are initiatives most effective.

7. Conclusion

In the introduction, a central question was posed: “What attracts who?”. As we have seen, policy makers have realized who they should target to stimulate the economy: the young and highly educated. However, the answer to the question of ‘what?’ remained unclear. Therefore, this research aimed to answer the question: How can Rotterdam attract and retain the young and highly educated population? The first step in this study was to analyze and confirm why it is important for cities to attract the young and highly educated.

A review on economic literature taught us that human capital is the most important predictor of regional growth. The second step for policy makers is to realize that human capital can be won or lost, as it is endowed with a population that is highly mobile and is attracted to places with access to a large job market and a rich supply of amenities. The third step is to analyze who are the people with a high level of human capital. Although the creative class surely has been a hot topic of late, the chapter argues why it is still valid to use education level as a proxy for human capital. In addition, it turns out that people are most mobile around the age of 25, after which the probabilities to move between municipalities decreases. For policy makers this implies that the highly educated are most easily attracted when they are young, and cities who fail to do so can hardly make up for it in the future.

A quick look at the current situation in Rotterdam showed us that indeed Rotterdam particularly fails to attract the age group 25-30 whereas the other large cities in the Netherlands do manage to attract them. Perhaps this is one of the reasons why Rotterdam also has the lowest share of highly educated population in the city, as annually it is shown that Rotterdam loses more highly educated people than it gains. Therefore, the aim of this research is analyze how Rotterdam could improve its position to attract and retain the young and highly educated population.

Rotterdam has around 60.000 students enrolled in higher education. The students are potentially the young and highly educated population that Rotterdam should target, but somehow fails to attract and retain currently. Therefore, this research aims to analyze how the students’ perceptions, preferences and characteristics influence to overall opinion on the city and their preferences of places to live in the future. In the presented conceptual model, the personal perceptions and preferences on aspects of life in Rotterdam, together with the characteristics of the respondent, are hypothesized to have an effect on the general judgment on Rotterdam. In the statistical analyses the general judgment is represented by a willingness to recommend the city as a place to live and a stated preference to live in Rotterdam in the future. In two periods, the questionnaire was distributed in classes and resulted in a sample of 580 respondents.

The statistical analyses confirmed the hypothesized relations that perceptions, preferences and characteristics have an influence on the judgment of Rotterdam. The students who have more experience with the city are significantly more positive in their judgment, which is a vital finding for policy makers, as it justifies the efforts to attract students as the chances of retaining the student increase with the amount of experience. The importance of the perception on the intangible aspects in coziness and openness of the cities has also been stressed. Following, a

principal component analysis was performed to extract factors among the variables. Four factors were extracted, and when the factor scores were correlated with the remaining items of the questionnaire, profiles of different groups within the population could be sketched. The main result of this analysis is that this research finds that the population of young and highly educated is in fact a diverse group with different perceptions and preferences. The four groups can be distinguished on the base of two variables, a preference for urban locations and the attitude towards Rotterdam. The four groups we distinguished were, Rotterdam Lovers, Career orientated city lovers, Rotterdam appreciative students, and the Campus visitors.

Based on the research results, three recommendations were proposed for the policy makers in Rotterdam. First, they should acknowledge that the student population is diverse, and specify their strategies accordingly. This should increase the effectiveness of their efforts. Further research could assist in further defining and locating the aforementioned groups. Second, policy makers should not abolish their current efforts directed at the young and highly educated population, rather they should expand them. As experience with the city has been found as a powerful predictor for their overall opinion on the city, efforts that aim to let the students experience the city, should therefore continue. Collaboration with the private sector, student associations and housing corporations would benefit the strength of the initiatives. In addition, a RotterdamLife office on campus Woudestein is suggested as a central node for the information flows of the different parties, so that the student is presented with information about the benefits and possibilities of living in Rotterdam, internships and job vacancies, and social activities organized by the students associations. Lastly, as the intangible aspects coziness and openness were found as strong predictors, this research suggests that the city marketing approach of Rotterdam should alter to incorporate those intangible aspects in presenting the city.

This research aimed to answer the question how Rotterdam can improve in attracting and retaining the young and highly educated population. It has shown that perceptions, preferences and characteristics of the students play a role in the overall evaluation of the city, and their preference to live in Rotterdam in the future.

Bibliography

Aghion, P., & Bolton, P. (1997). A theory of trickle-down growth and development. *The Review of Economic Studies* , 64 (2), 151-172.

Alwin, D. F., & Krosnick, J. A. (1985). The measurement of values in surveys: A comparison of ratings and rankings. *Public Opinion Quarterly* , 49, 535-552.

Bates, T. (1990). Entrepreneur human capital inputs and small business longevity. *Review of Economics and Statistics* , 72, 551-559.

Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. Chicago: University of Chicago Press.

Beest, J. van., Klomp, L., & Uxem, F. van. (1997). Voorbereiding op de start en succes. In EIM, *Oplevend ondernemerschap in Nederland* (pp. 131-144). Zoetermeer.

Berg, L. van den., Pol, P. M., Mingardo, G., & Speller, C. J. (2005). *The Safe City, an International Comparative Urban Study on Safety and Urban Development*. Rotterdam: EURICUR.

Black, S. E., & Lynch, L. M. (1996). Human capital investment and productivity. *American Economic Review* , 86, 263-267.

Blanchflower, D. G. (2004). *Self-employment: More may not be better*. NBER Working Paper 10286.

Bosma, N., van Praag, M., & de Wit, G. (2000). *Determinants of Successful Entrepreneurship*. EIM, Scales, Zoetermeer.

Braun, E. (2008). *City Marketing: Towards an integrated approach*. Dissertation, Erasmus University Rotterdam.

BTA Economic Research Institute. (1994). *The 1994 Geographic reference report*.

Centraal Bureau voor de Statistiek. (2010). The Hague/Heerlen: Statline Databank, CBS.

Centraal Bureau voor de Statistiek. (2010b). *Intergrale Veiligheidsmonitor 2009*. The Hague/Heerlen: CBS.

Clark, T. N. (2003). Urban Amenities: Lakes, opera and juice bars do they drive development? *Research in Urban Policy* , 9, 103-140.

Cortright, J., & Coletta, C. (2005). *The Young and the Restless in the Knowledge Economy*. CEOs for Cities.

- Cullen, J. B., & Levitt, S. D. (1999). Crime, Urban Flight, and the Consequences for Cities. *Review of Economics and Statistics* , 81, 159-169.
- Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing* , 18, 301-331.
- Dujardin, M., & Van der Zanden, W. (2010). *Komen en Gaan*. Rotterdam: Centrum voor Onderzoek en Statistiek (COS).
- Duranton, G., & Puga, D. (2001). Nursery cities: urban diversity, process innovation, and the life cycle of products. *American Economic Review* , 91 (5), 1454-1477.
- Echtner, C., & Ritchie, B. (2003). The Meaning and Measurement of Destination Image. *The Journal of Tourism Studies* , 14 (1), 37-48.
- Field, A. (2009). *Discovering Statistics Using SPSS*. London: Sage Publications.
- Florida, R. (2002). *The Rise of the Creative Class*. New York: Basic Books.
- Florida, R. (2005a). *Cities and the Creative Class*. New York: Routledge.
- Florida, R. (2005b). *The Flight of the Creative Class: The new global competition for talent*. New York: HarperCollins Publishers.
- Florida, R. (2008). *Who's Your City?* . New York: Basic Books.
- Glaeser, E. L. (1998). Are cities dying? *Journal of Economic Perspectives*, 12 (2), 139-160.
- Glaeser, E. L. (2000). Cities and Ethics: An Essay for Jane Jacobs. *Journal of Urban Affairs* , 22 (4), 473-493.
- Glaeser, E. (2004). Review of Richard Florida's *The Rise of the Creative Class*. Accessible at www.creativeclass.com/rfcgdb/articles/GlaeserReview.pdf
- Glaeser, E. L. (2005). Reinventing Boston. *Journal of Economic Geography* , 5 (2), 119-153.
- Glaeser, E. L., & Saiz, A. (2003). *The Rise of the Skilled City*. NBER Working Paper 10191.
- Glaeser, E. L., Kallal, H., Scheinkman, J. A., & Schleiffer, A. (1992). Growth in Cities. *Journal of Political Economy* , 100 (6), 1126-1152.
- Glaeser, E. L., Kolko, J., & Saiz, A. (2001). Consumer City. *Journal of Economic Geography* , 1 (1), 27-50.

- Glaeser, E. L., Scheinkman, J. A., & Schleifer, A. (1995). Economic growth in a cross-section of cities. *Journal of Monetary Economics* , 36, 117-143.
- Groot, S. P., Smit, M. J., & de Groot, H. L. (2009). *Regional Wage Differences in The Netherlands*. CPB Working Paper.
- Harzing et al., A. (2009). Rating versus ranking: What is the best way to reduce response and language bias in cross national research. *International Business Review* , 18, 417-432.
- Henderson, V. (2003). Marshall's scale economies. *Journal of Urban Economics* , 53, 1-28.
- Hoogstad, M. (2010, June 28). Poppodium Watt zat in onmogelijke spagaat. *NRC Next* , p. 9.
- Hui, T. K., Wan, D., & Ho, A. (2007). Tourists' satisfaction, recommendation and revisiting Singapore. *Tourism Management* , 28 (4), 965-975.
- Hutcheson, G., & Sofroniou, N. (1999). *The multivariate social scientist*. London: Sage.
- Jacobs, J. (1969). *The Economy of Cities*. New York: Vintage.
- de Jong, M. (1987). *New economic activities and regional dynamics*. Amsterdam: Koninklijke Geografische Studies.
- Kozak, M., & Rimmington, M. (1999). Measuring tourist destination competitiveness: conceptual consideration and empirical findings. *Hospitality Management* , 18, 273-283.
- Kozak, M., & Rimmington, M. (2000). Tourist Satisfaciton with Mallorca, Spain, as an Off-Season Holiday Destination. *Journal of Travel Research* , 38 (3), 260-269.
- Krugman, P. R. (1991). Increasing returns and economic geography. *Journal of Political Economy* , 99, 483-499.
- Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics* , 22, 3-42.
- Maalsté, N. (2000). *Ad fundum! Een blik in de gevarieerde drinkcultuur van het Nederlandse studentenleven*. Utrecht: Centrum voor Verslavingsonderzoek, Unversiteit Utrecht.
- Marchal, M. (2009, March 26). Rotterdam moet een studentenstad worden. *Erasmus Magazine* , pp. 14-16.
- Marlet, G. A., & Woerkens, C. M. (2005). *Tolernace, aesthetics, amenities or jobs? Dutch city attraction to the creative class*. Discussion Paper 05-33, Univeristeit Utrecht, Utrecht School of Economics.
- Marlet, G. (2009). *De Aantrekkelijke Stad*. Utrecht: VOC Uitgever.

- Marlet, G., & Woerkens, C. v. (2007). The Dutch Creative Class and How it Fosters Urban Employment Growth. *Urban Studies* , 44 (13), 2605-2626.
- Marshall, A. (1890). *Principles of Economics*. London: Macmillan.
- Mathur, V. K. (1999). Human capital based strategy for regional economic development. *Economic Development Quarterly* , 13 (3), 203-216.
- Nguyen, C., Romaniuk, J., & East, R. (forthcoming). Understanding Self-Reported Probabilities of Giving Word of Mouth. *European Marketing Academy Conference 2010*. Copenhagen, Denmark.
- OBR. (2010). *Economische Verkenning 2009-2010*. Ontwikkelings Bedrijf Rotterdam, Rotterdam.
- Praag, C. M. (1996). *Determinants of successful entrepreneurship*. Amsterdam: Thesis Publishers.
- Rappaport, J. (1999). *Local Growth Empirics*. CID Working Paper No. 23.
- Rauch, J. E. (1993). Productivity gains from geographic concentration of human capital: Evidence from the cities. *Journal of Urban Economics* , 34, 380-400.
- Reichfeld, F. F. (2003). The One Number You Need to Grow. *Harvard Business Review* , 1-11.
- Romer, P. M. (1990). Capital, labor and productivity. In M. N. Baily, & C. Winston, *Brookings papers on economic activity: Microeconomics* (pp. 317-367). Washington, DC: Brookings Institution.
- Russo, A., van den Berg, L., & Lavanga, M. (2003). The Student City: Strategic Planning for Student Communities in EU Cities. *European Congress of the Regional Science Association* (pp. 1-24).
- Santagata, W. (2002). Cultural Districts, Property Rights and Sustainable Economics Growth. *International Journal of Urban and Regional Research* , 26 (1), 9-23.
- Schultz, T. W. (1961). Investment in Human Capital. *American Economic Review* , 51, 1-17.
- Schutjens, V. A., & Wever, E. (2000). Determinants of new firm success. *Papers in Regional Science* , 79, 135-159.
- Shapiro, J. (2003). *Smart Cities: Explaining the Relationship between City Growth and Human Capital*. Harvard University. Mimeographed.
- Smith, A. (1776). *An Inquiry into the Nature and causes of the Wealth of Nations*. London: Methuen.
- Stel, A. v., Storey, D. J., & Thurik, A. R. (2006). *The effect of business regulation on nascent and young business entrepreneurship*. Zoetermeer: EIM.
- Storey, D. J. (1994). *Understanding the small business sector*. London/New York: Routledge.

Annex A – The Questionnaire

Please note: the questionnaire here is presented at a smaller scale.

Perception of Rotterdam by Students

General Information	Gender		Education Level		Age	Faculty	Nationality	
Please indicate the appropriate answer	Male <input type="checkbox"/>	Female <input type="checkbox"/>	Bachelor <input type="checkbox"/>	Master <input type="checkbox"/>	Dutch <input type="checkbox"/>	Non-Dutch <input type="checkbox"/>

Example: Dutch National Soccer Team

Ratings: 1 = very negative, 3= average, 5=very positive, **Rankings:** 1=most important, 2=second most important, etc.

How would you rate and rank the following aspects	1	2	3	4	5	Ranking of importance
The team's offense	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2
The team's defense	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
The coach	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3

Conclusion: The team's offense scores best, but the defense is considered to be most important to the team's success.

Theme 1: Your Living Environment in Rotterdam	Yes	No
Do you live in Rotterdam?*	<input type="checkbox"/>	<input type="checkbox"/>

* If you have checked "No" please skip this theme and continue with theme 2.

How would you rate and rank the following aspects	1	2	3	4	5	Ranking of importance
Quality of your home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
Price of your home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
Quality of your neighborhood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
Accessibility to transport networks (metro, roads)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
Accessibility to services (grocery stores, bars, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...

Theme 2: Going out in Rotterdam	Rarely	Sometimes	Often
How often do you go out in Rotterdam to eat, drink, dance, shop etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How would you rate and rank the following aspects	1	2	3	4	5	Ranking of importance
Place to shop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
Places to eat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
Places to drink	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
Places to dance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
Ease of transport within city (getting around)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...

Theme 3: Campus life	Rarely	Sometimes	Often
In addition to attending lectures, how often do you use campus services (the library, dining hall, the bar Smitse etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How would you rate and rank the following aspects	1	2	3	4	5	Ranking of importance
Study facilities (computers, library, printers etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
Leisure facilities (dining hall, Smitse, coffee lounge)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
Atmosphere, architecture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
Campus accessibility (by car, bike, metro, tram, bus)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...
Lectures and classes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	...

Theme 4: Life after school in Rotterdam	Yes	No
In the past year, have you actively participated in extracurricular activities in Rotterdam (sport clubs, arts, students associations, side-jobs)	<input type="checkbox"/>	<input type="checkbox"/>

How would you rate and rank the following aspects	1	2	3	4	5
Sport facilities (sport clubs, fitness centres etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Performing arts facilities (dancing, singing, theater)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student associations (fraternities, study associations)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability and accessibility of student jobs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ranking of importance
...
...
...
...

Of the previous four themes (three if you are not a Rotterdam resident), which theme is most influential to your overall experience and perception of Rotterdam?
Direct living environment
Going out in Rotterdam
Campus
After-school activities

Ranking of importance
...
...
...
...

How would you rate Rotterdam in terms of...	1	2	3	4	5
Beauty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cozy atmosphere (NL: gezelligheid)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vibrancy (NL: levendig)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Openness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Which are most important to you? Please rank below.
...
...
...
...
...

In looking for a place to live and work after graduation, which are the most important factors?
Quality of the accommodation
Quality of the neighbourhood
Vicinity (closeness) to friends, family and/or partner
Career opportunities
Access to leisure amenities (things to enjoy, bars, museums, cinema's, soccer teams)

Ranking of importance
...
...
...
...
...

In five and fifteen years, where would you prefer to live?	In 5 years	In 15 years
In or near Rotterdam	<input type="checkbox"/>	<input type="checkbox"/>
In or near another large city (e.g. Amsterdam, Utrecht)	<input type="checkbox"/>	<input type="checkbox"/>
Just outside of a large city	<input type="checkbox"/>	<input type="checkbox"/>
In a medium sized city (e.g. Arnhem, Haarlem)	<input type="checkbox"/>	<input type="checkbox"/>
In a village or rural area	<input type="checkbox"/>	<input type="checkbox"/>

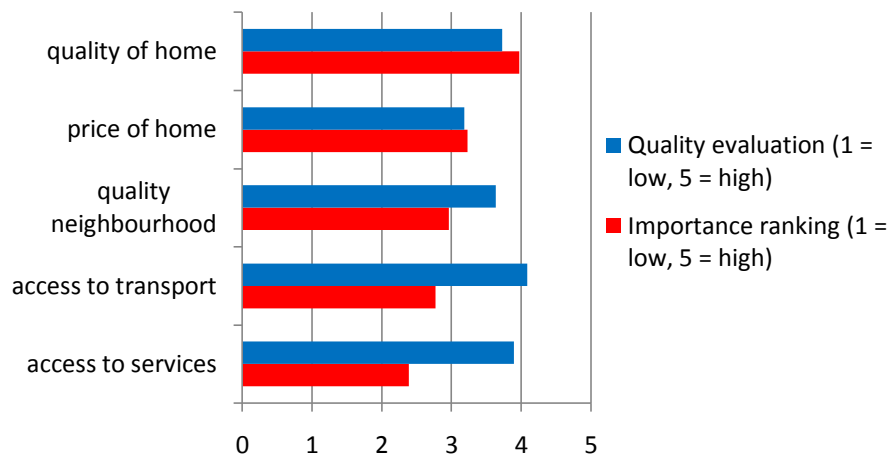
Overall judgment on Rotterdam	1	2	3	4	5
How would you rate Rotterdam specifically for students ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How would you rate Rotterdam in general ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Would you recommend Rotterdam?	Yes	No
Would you recommend Rotterdam to a (distant) friend as a place to live ?	<input type="checkbox"/>	<input type="checkbox"/>
Would you recommend Rotterdam to a (distant) friend as a place to work ?	<input type="checkbox"/>	<input type="checkbox"/>

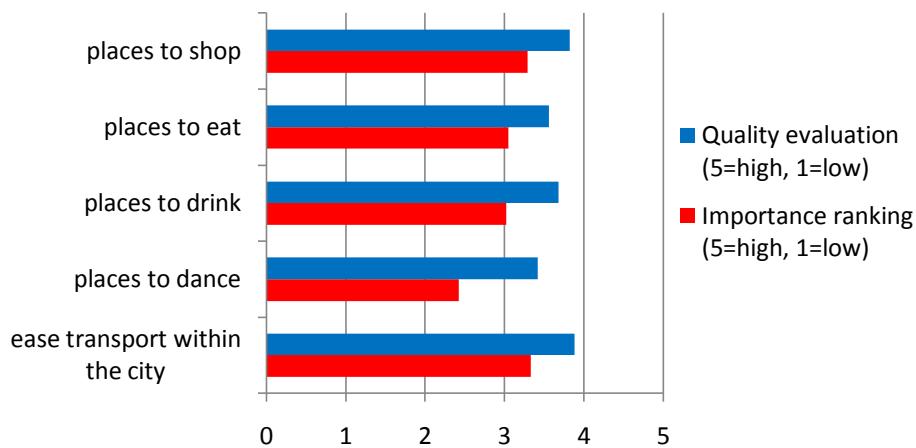
Annex B – Mean Statistics

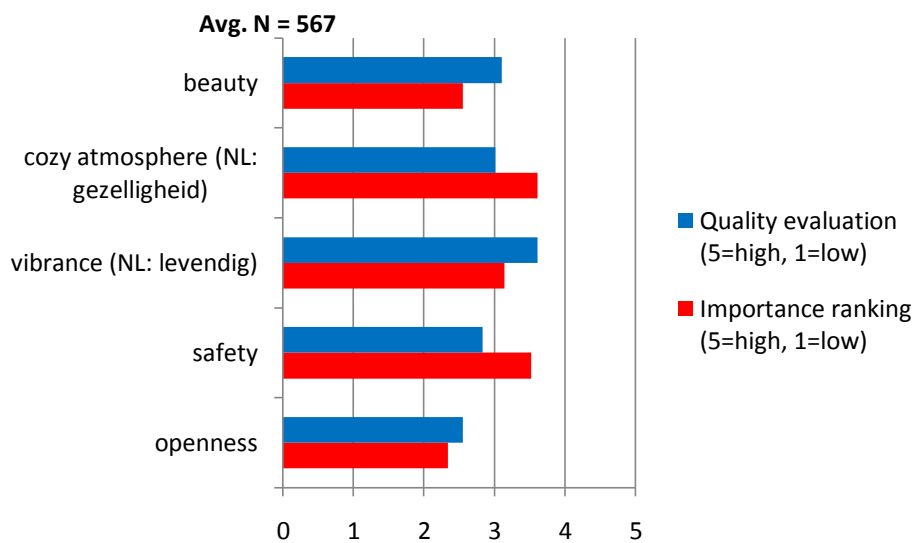
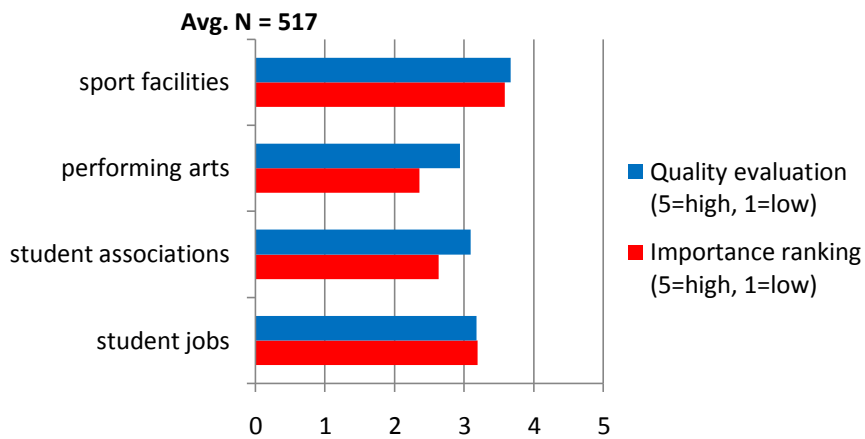
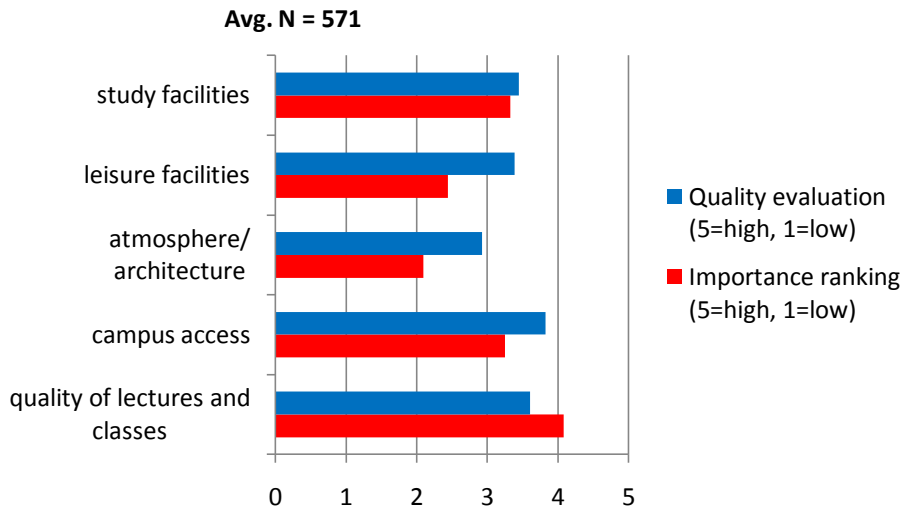
In the following charts below, the mean statistics of the evaluation and importance ranking variables are reported per theme. Important to note here is that the scale of the importance ranking has been inverted, therefore, a value of 1 marks the lowest level of importance and 5 marks the highest level of importance.

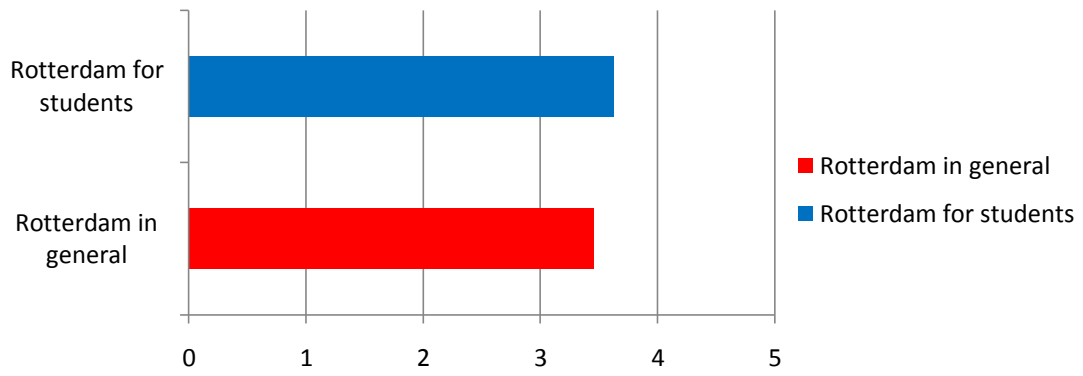
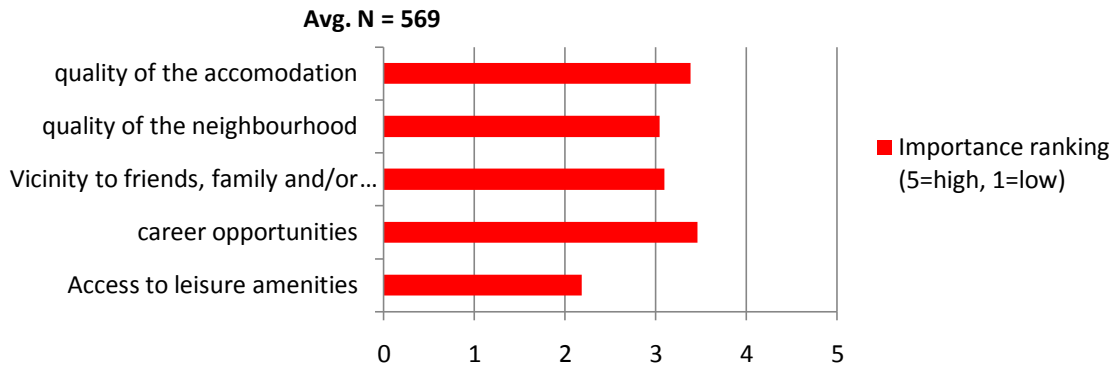
Avg. N = 279



Avg. N = 568







Annex C – Correlation table of the extracted components

Table 18 - Correlations of components with the rest of the independent variables

Item	Love for the city	Preference for practical matters, sober lifestyle	Preference for career opportunities	Preference for peace and comfort
Gender	,025	-,065	-,058	-,164
Age	-,030	,025	,075	-,045
Live in Rotterdam	,062	-,143	,208	-,073
Going out in Rotterdam	,137	-,122	,023	-,097
Use of campus services	-,080	,011	,128	,076
Participation extra curric.	,106	-,069	,035	-,017
Rating for students	,566	-,001	-,024	,206
Rating general	,689	-,023	,049	,007
Place to live	,537	-,102	,055	-,040
Place to work	,254	,004	,028	,097
Prefers Rotterdam	,362	-,074	-,035	,012
Prefers another city	-,241	-,058	,120	-,147
Prefers no city	-,137	,201	-,074	,164
Places to shop	,404	-,129	-,079	,178
Places to drink	,382	-,229	-,028	,218
Places to dance	,289	-,059	-,010	,082
Ease of transport	,318	-,015	,096	,071
Imp of shopping	,067	,317	-,030	,060
Imp of eating	,023	-,025	,073	,040
Imp of dancing	,070	-,083	-,049	-,187
Imp of transport	-,051	,390	,084	,091
Study facilities	,221	,014	,157	,221
Atmosphere	,304	,085	,056	,243
Campus access	,275	-,011	,047	,177
Lectures classes	,198	,078	,083	,113
Imp study facilities	-,062	-,076	,115	,149
Imp leisure facilities	-,016	-,192	-,053	-,105
Imp atmosphere	,099	-,226	-,077	-,145
Imp lectures	,025	,032	,054	,113
Sport facilities	,321	-,062	,020	,082
Performing arts	,228	-,089	,045	,119
Student association	,044	-,090	,177	,149
Student jobs	,224	-,086	-,011	,117
Imp sports	,001	,017	,083	,086
Imp performing	-,092	-,053	,024	,009
Imp associations	-,133	-,137	,092	,042
Imp student jobs	-,076	,103	,014	,150
Safety	,498	,064	,125	-,065
Imp beauty	,049	-,077	,031	-,224
Imp coziness	-,025	-,034	-,068	-,072
Imp vibrancy	,020	-,041	,127	-,245
Imp openness	,034	,014	-,003	-,100
Imp accommodation	,106	,076	-,260	,027
Imp friends	,044	,026	,044	,037

Note: $p < ,001$. * $p < ,05$ ** $p < ,01$ *** $p < ,001$