# The Rate of Diffusion of Innovations

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# Abstract

Everybody is familiar with innovations. Because of these new products and processes companies and people keep on improving their achievements. However, not all the innovations are successes and not everyone knows that there are innovations available to improve some processes.

Everett Rogers did a lot of research in the field of innovations, to describe the adoption process of consumers. He developed a complete framework that could be used for different types of relevant markets. Because of this framework a lot of products are introduced a lot better into the marketplace, so more people knew earlier that the solution for their problem was available in the store. However, is this theory applicable to all the relevant markets?

In this study a specific market group, people from 15 to 25 years of age, is tested on the determinants of the rate of diffusion. To do so, first the different kinds of innovations and the known adoption and diffusion theory are described. After that, a study is included which measures the different influences on the personal rate of adoption of young people. It appeared that the product and the marketing strategy are very important at the company side and that personal innovativeness is very important at the consumer side. So, the assumption of Rogers that the combination of the message and the social system are important is indeed true, but it appeared that the studied group is indeed different than the framework suggests. However, the framework is still applicable since the differences are not substantial.

Content

# 1. Introduction

Most students could not picture themselves without their mobile phone. They are heavily depended of this little device; in the first place it is the key to their social life, but of course their last help to survive the always delayed public transport or a boring lecture. The volume of this market is enormous, although the product is only fifteen years available in the consumer market. After the introduction of the product many adaptations followed. Those innovations made the mobile phone the product as we know it nowadays. Because of this product improvement, the demand rose exponential. Everybody wants to have the most recent editions, what was very clear when Apple introduced the iPhone.

The mobile phone is only one example of many product categories in which product en process innovations are a major driver. Due to the technology improvements of the last decade(s), it is possible for producers to let the innovations follow up each other rapidly. However, not all the innovations are proper ones and a lot of producers often do not know how to market their new products. The main reason for this effect is the fact that it is impossible for firms to know who will want to have the new product. There is done lots of resource in the field of diffusion theory, started by Gabriel Tarde (1903), who proposed the S-shaped diffusion curve. After this research not many investigation followed until 1943. In this year Bryce Ryan and Neal Gross published their study about diffusion. This lead to an enormous overflow of publications. Rogers contributed a lot to the research and many others followed him.

This general research could be useful for all sorts of target markets. However, these relevant markets are becoming more and more specific nowadays. The goal of this study is to show that there is a need for research among different categories of people, because current target groups will react different on innovations. This is tested in this study among a group of young people from 15 to 25 years of age. The main question is:

*What are the determinants of the rate of diffusion of new product innovations among young people?*

To answer this question some hypothesis should be tested. Before this is possible all the types of innovations will be described first. This is very important, because it shows how great the contribution of a difference could be. When this is done, the diffusion and adoption theories of Rogers and some other researchers will be described. The determinants of the rate of diffusion for

the side of the company will be described now too. Finally the hypotheses are presented. These hypotheses are tested to answer the main question at the consumer level. At the end of the research a complete picture is presented with the influences on both the sides of the customer and the company. With this framework the main question could be answered.

# 2. Innovations

One cannot imagine a world without innovations. Every single day new products or improved ones are launched into the marketplace. Still, not everyone is familiar with to concept itself. Many people often say that it is not possible to innovate further within their organization. Those people are wrong. Every process in a company could be improved by new product or process innovations. Besides this mindset, there are lots of people who only see innovations as complete new products. Therefore it is necessary to explain the concept 'innovation' itself before I will continue with the description of the known theories behind the concept.

## *2.1 Types of Innovations*

When you ask people about innovations, they almost always think about the most radical sort possible. They tend to think more about an invention instead of an innovation. Those inventions, when they will be branded, are indeed a very important type of innovation, but there are many more forms. Normally, there are two kinds of innovations on two kinds of levels. On the one hand there are radical innovations and on the other hand there are incremental innovations. A radical innovation is completely new, while an incremental innovation is an improvement of an existing idea. Both these two types of innovations can be executed as a product or a process innovation. But according to Geoffrey A. More (2005) there are fifteen types of innovations. He explains this in his book 'Dealing with Darwin' by the means of the following image:

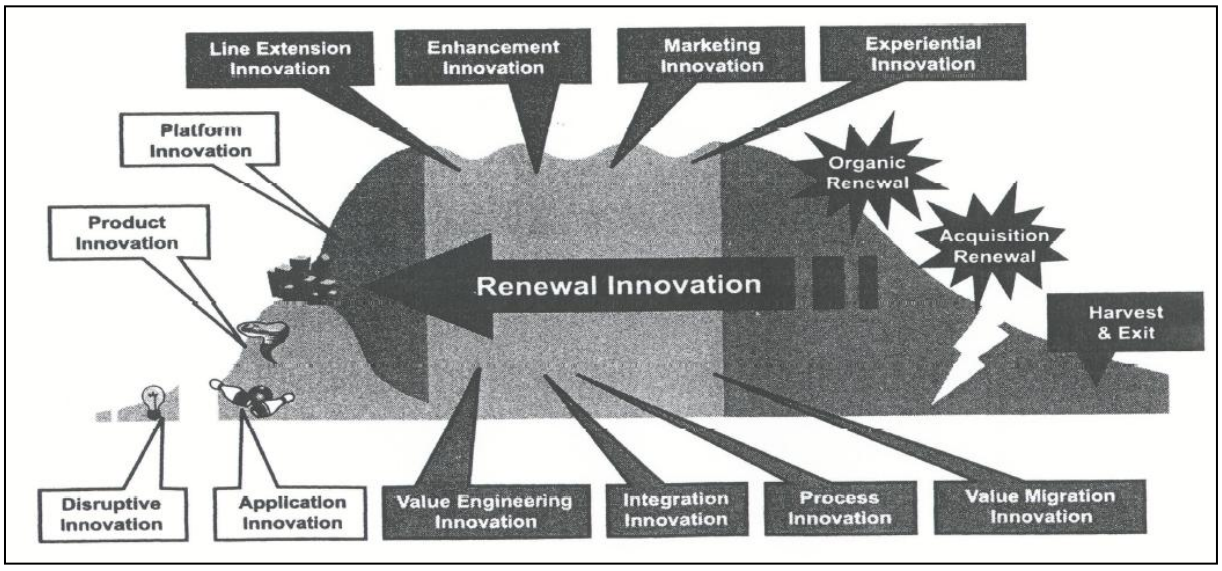



**Image 1: Different types of innovations**

This image shows a product life cycle and the arrows indicate where the innovations take place in this life cycle. To explain the different types properly, the author divided the fifteen types into four categories as follows:

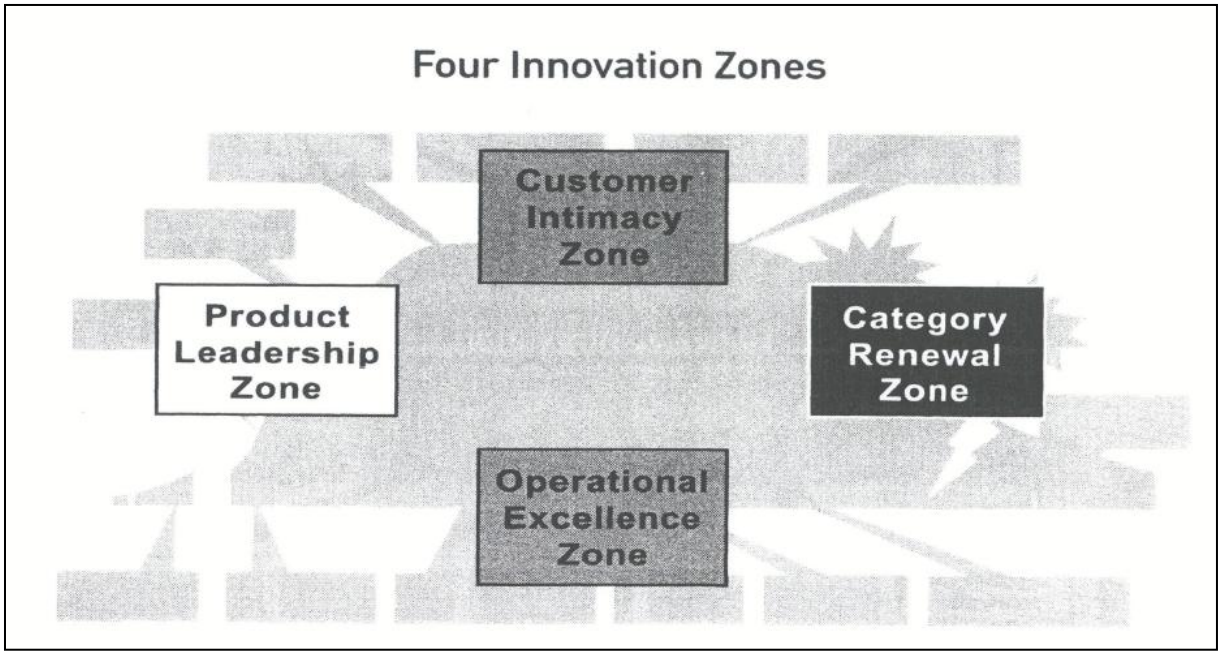



**Image 2: The four innovation zones**

The four 'zones' are containing different types of innovations which are strongly related to each other. Now I shall explain the different zones.

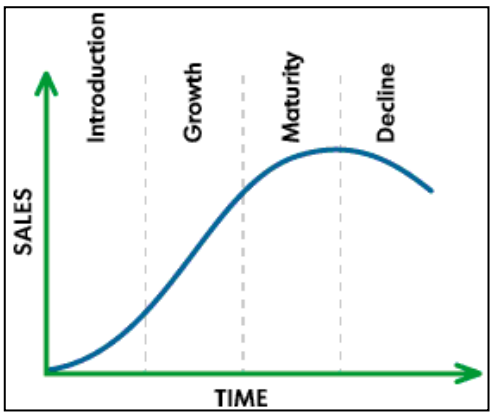



**Image 3: Product life cycle**

2.1.1 The Product Leadership Zone: This zone contains all the radical innovations that are made. This can be seen very well in the image, because the zone is located in the introduction stage of the product life cycle (see image on the right). All new products are located in this area when they are just introduced.

There are four types of innovations included in this zone: disruptive, application, product and platform innovations. A disruptive innovation is a new product, process or service in an entirely new market. This type of innovation is comparable to an invention and is for example the television or the personal computer. An application innovation happens when an existing product, process or service

is used in a new market. This happened for example with internet banking. An existing product, the internet, is now used in a new market, banking. A product innovation is an innovation where an existing product in an existing market is differentiated to get a competitive advantage. For example the iPod touch is a product innovation of the regular iPod in the mp3-players market. This could be dangerous, because cannibalization can play a big part. Cannibalization happens when a customer buys an iPod touch instead of a regular iPod, while he was supposed to buy this regular one. Now the iPod touch stole a customer of the other product of Apple who exists in the same market. The last type of innovation in this zone is the platform innovation. This innovation creates an extra product for an existing, but very complex, one. Now this complex product is used. This happens quite often with for instance difficult software programs.

All these types of innovations lead to new products, processes of service that should be introduced. This leads to lots of R&D expenses and of course a lot of risk for the company. But, when the innovation turns out to be a success, it will lead to an enormous amount of market share, sales and profit.

2.1.1 The Customer Intimacy Zone: This zone contains all the types of innovations that are made to differentiate the product from the other product that are available. In this stage all the products are quite the same. The image of the product life cycle shows this very well, because the zone lies in the maturity stage of the cycle. All fairly known products occur in this stage.

There are four types of innovations included in this zone: line extension, enhancement, marketing and experimental innovations. A line extension innovation is made when a company creates a subcategory within their current assortment. This happened for instance when Axe decided to produce shower gel next to their well known deodorant or 'body spray'. An enhancement innovation is a very small line extension. Now the producers will not create a subcategory, but they will just change the current products. For instance a new taste of Pepsi, lemon. A marketing innovation is an even smaller adaption, because it is not a change in a product but a different way of marketing. This happened for instance with Independer.nl. The company advertised first only on the internet, but when the market became crowded they decided to advertise on the television too. The change of marketing means paid off very well for them. The last type of innovation in this zone is the experiential innovation. This innovation changes the experience of a product. This happens for instance in restaurants, because the interior of an Italian restaurant is Italian and of a Chinese restaurant is Chinese. Therefore there is no risk in the purchase decision: You know what you can expect.

All these types of innovations can be used within a mature market where all the products are comparable to each other. When a company is able to create a subcategory, different types of the same product, a different marketing strategy or a different experience then the competition, they are still able to gain new customers and keep the old ones.

2.1.3 The Operational Excellence Zone: This zone contains all the types of innovations that can be made by companies to improve their own profit margin. It is necessary to improve this margin when the competition is harsh and therefore the profits will be low. The competition will be fierce when the product is in the maturity stage, what can be seen in the image.

There are four types of innovations included in this zone: value-engineering, integration, process and value migration innovations. A value-engineering innovation is a process innovation where companies try to lower their material and manufacturing costs, while keeping the quality and selling price at the same level. The profit will rise immediately when this is done properly. An example is for instance outsourcing. An integration innovation a cost-saver too, but now the company should try to replace a very complex system / process into one central action. Some kind of change can be made in many small companies where they often use two or more systems instead of one. A process innovation is a well known type of innovation, where companies try to improve their inner company processes to save money. This kind of adaption is always possible, even though not everyone will agree with me on this. Employees or people from inside the company often do not see the complete picture anymore, so they will not see any possibilities for improvement. But people from outside probably will see many opportunities to cut costs. The last type of innovation in this zone is the value migration innovation. This innovation is an ultimate means to improve the margin of a company. The intention of this innovation is to change a product into a consumable, as with razors and razorblades and printers and cartridges (Moore, 2005).

Companies will only start to use some of these innovations when this is necessary. In a mature market there is always a possibility that the sales will not be satisfying. So companies have to create space to make profit and this kind of innovations will be necessary. Of course this kind of innovations could be adopted spontaneously when there are for instance new technology breakthroughs, or just when someone sees the opportunity to improve a process.

2.1.4 The Category Renewal Zone: This zone contains all types of innovations that can be used in a declining market. The types of innovations that belong to this zone are: the organic or acquisition innovation or harvest & exit. An organic innovation is necessary for a company when they find

themselves back in a declining market where the sales are declining. With this kind of innovation the company tries to reposition their products in the same sector. The goal is to create an extra growth in the product life cycle. The second type of innovation that is possible to use is the acquisition innovation. Now the company tries to buy or merge with another company to become a stronger competitor within the declining market. When these means are not possible or did not work out, the company can always decide to leave the market. For instance Adidas did a great job with their retro line of football shoes. They stopped to market these shoes a long time ago, but the demand for the product is still enormous. So they still make profit on this product. All these solutions are a final move and those are of course not recommended.

It is good to understand that there are lots of different forms of innovations, but in the rest of this thesis only the product innovations for the consumer market will be used. Because there are so many forms, it is quite clear that there are lots of possibilities for companies or individuals to come up with proper innovations. But unfortunately coming up with a new idea is not the hardest part. It is usually much tougher than someone could imagine getting the idea adopted by a second or third party to get it implemented or produced. Once a product gets adopted, the diffusion of an innovation takes place. The diffusion process is the spreading of the new product over the potential users. This process is widely investigated and described by Everett Rogers. His theory will be analyzed in the following part.

# 3. The Diffusion of Innovations

It is very hard and often very costly too, for producers or individuals to come up with a new proper innovation. Usually it costs a lot of time, effort and money to create this improvement and is it therefore required to earn back the investment as soon as possible. For this reason it is often necessary to speed up the adoption process of the innovation, to make it possible to make a profit on it quickly. Once someone knows about the innovation, one could decide to adopt or reject it. Unfortunately, it takes a lot of time to introduce someone to a new idea. The first step of the diffusion process is the individual adoption decision.

## *3.1 The Adoption Process*

As soon as someone is informed about a innovation, the individual adoption process is started. This is a very important step and after this several more will follow. The process is represented by the image underneath:

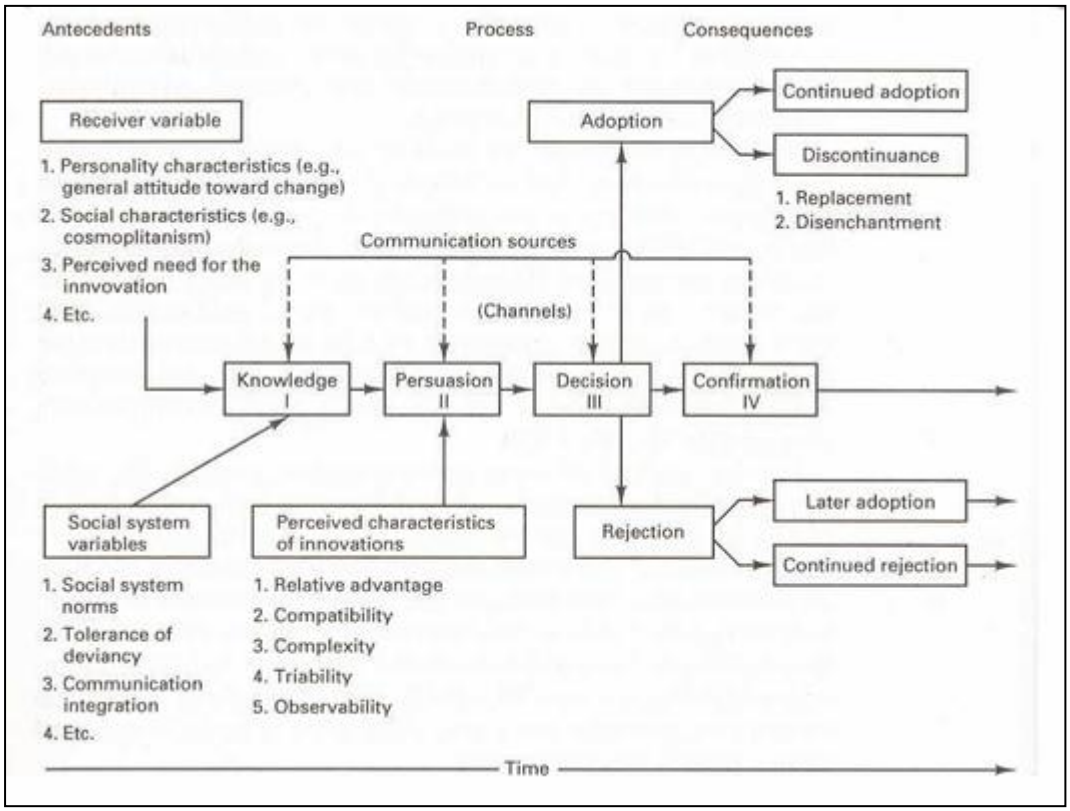



**Image 4: The adoption process**

The system in the image starts when there is an innovation and the company or individual starts with communicating the message through the multiple communication channels. After this has happened, there follow five steps in the process: knowledge, persuasion, decision, implementation (not mentioned in the picture) and confirmation. I shall describe the five steps proposed by Rogers (1995).

3.1.1 Knowledge: The first stage occurs when an individual gets information about an innovation and starts to know what it contains and how it works. This step is affected by the receiver and social system variables. These variables indicate an attitude of a person towards innovations in general but the particular innovation as well. It is important whether a person is willing to take some risk, whether the person has the financial possibilities to buy the innovation and whether the person knows properly what the innovation is about and how it should be used. All these kinds of influences can be changed into positive factors when the information (message) is solid and good information is passed forward to the individual.

3.1.2 Persuasion: The second stage occurs when a person starts to form an opinion about the innovation. This can be either a positive or a negative attitude. This stage is of course influenced by the communication of the message, but it is influenced by the perceived characteristics of the innovation too. These are five factors mentioned by Rogers (1995) that play a big part in the formation of an opinion towards the innovation. These five factors are: relative advantage, compatibility, complexity, trialability and observability.

- **Relative Advantage**: This is the degree to which the innovation is better than the existing solution. When an idea is very marvelous, the relative advantage is very large and the adoption time shall be quite short. But when the new idea is not a big difference with the existing solution of the problem, this time will be larger. People now do not see the essence in buying this new product instead of the old one that works properly. Not only the practical side of an innovation is crucial, but social prestige, convenience and satisfaction are also important factors (Rogers, 1995).
- **Compatibility**: This is the degree to which the innovation 'fits' into the life of the adopter. This concept has to do with the social system in which an individual lives. Some sorts of innovations are not to be wished for. Like for instance the resistance of the Pope against birth-control. This issue is still a subject of discussion while the 'solution' is invented decades ago. When the compatibility of an innovation is very low, it will take a long time before people are used to it, but when it is compatible, one will adopt it quite soon.

- **Complexity**: This is the degree to which the innovation is understandable for the user. When the idea is too complex / difficult, one shall not know how to use it and therefore it will not get adopted. Very complex ideas will be adopted very slowly if there is a lack of information. So people should be informed very well to create a new need for this product. A good example is the personal computer. If an innovation is not very complex, and everybody will understand it immediately, the issue of complexity will not increase the rate of adoption.
- **Trialability**: This is the degree to which it is possible to try out an innovation. It is a well known phenomenon in the car business, because there are lots of innovations done in that industry. People will tend to overlook at those things and just focus on the price. Why should you pay more for a car that could park itself while I can do it too? When a dealer (salesman) persuades you into a test drive it might to be worth the money after all. If a complex innovation is high on trialability, the adoption time will be shorter.
- **Observability**: This is the degree to which the innovation is observable to others. If many people are using the new product and / or the advantages are highly visible, one can easily been convinced that the innovation is a proper one. When it is very difficult to see the advantages that the new idea has in favor of the old solution, people might think that the old solution will do. So if the observability of the advantages of an innovation is large, the adoption time for an individual will be short.

If the results of the characteristics of the innovation are positive, the outcome of the persuasion step will probably positive.

3.1.3 Decision and Implementation: The third step occurs when an individual or a company is ready to decide whether or not to adopt the innovation. If one decides to adopt the innovation, the mission of the producer is accomplished. Of course it is possible that a consumer decides to reject the innovation. At this point the process starts again. This happens because people in the social system could be still in the decision process, so they could convince the 'rejecter' to adopt the product after all. Besides these people, there is a possibility that other people, who adopted the product, influence the initial opinion of the rejecter.

If the consumer decides to adopt the innovation, the implementation stage will start. This stage occurs when the customer decides to buy the innovation and puts it into use. Besides buying the product right away, there is another possibility too in the implementation stage. It could be possible that one is willing to adopt the product, because the consumer is for instance very enthusiastic about it, but he need more information about the product before he decides to buy it. When this information is given, the consumer is ready to start to use the innovation.

3.1.4 Confirmation: The final step occurs when the final decision whether or not to adopt the innovation is made. At this point there is an opportunity for the adopters to decide to continue the usage of the product or reject it after all. For the rejecters there is a same sort of possibility. Other information can change their mind into adopting the product after all, but they can of course still decide to ignore the product.

The described mechanism is based on the quote of Rogers (1995), in which he said that the diffusion process is the communication of an innovation through certain channels over time among the members of a social system. The message (innovation) is formed before the first step starts, but this communication influences every single step of the mechanism. The communication channels can be all sorts of channels, from worth-of-mouth to television commercials to advice in the store. The members of a social system can be everyone as well. Individuals tend to use worth-of-mouth within their own social network, but companies will focus on segments out of the population, dependant to the innovation. Still, the comments of opinion leaders and lead users seem to be very important for people. Therefore, many firms aim their strategy on this people. If those people will adopt and use the product, many others from their social system will follow their example. Finally, the process is a process which can take a very long, but a very short time too. It is dependant of the kind of innovation and of course of the person how long the process will take. So the factor time is completely dependent of the sort of innovation and the consumer. But the adoption of one individual is not important for a firm. For firms it only matters if a lot of individuals decide to adopt and buy the product, so the innovation becomes profitable. This process is called diffusion; the spreading of the product over the population.

## *3.2 Diffusion*

When an individual or a company comes up with a new idea, they want this idea to get used by all the potential users as soon as possible. Therefore the product should be adopted by lots of individuals rapidly. This spreading of an innovation is called diffusion. According to Rogers is diffusion:

*'The process by which an innovation is communicated through certain channels over time among the members of a social system' (Rogers, 1995).*

This quote is seen before at an individual level. Here it means that diffusion is a communication process where the new idea is the message. The innovator should spread this message by multiple channels to inform as many people as possible who could be interested in this new idea. When this is

done properly, one is able to follow the adoption process and could decide if the innovation is rejected or adopted. So diffusion is the adoption process of the population. According to Rogers most innovations get adopted at an S-shaped rate, first proposed by Tarde (1903):

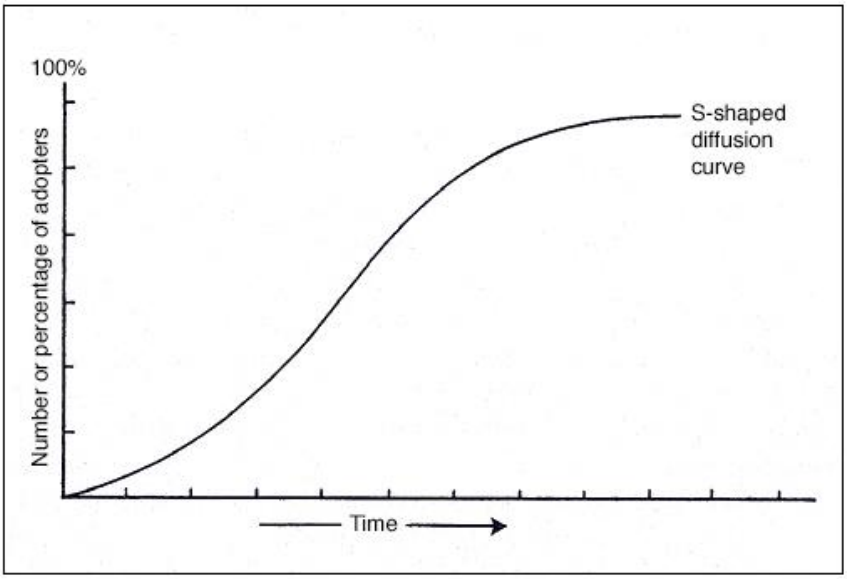



**Image 5: The S-shaped curve**

This graph shows that right after the introduction only a few people adopt the product right away. After some time the rate goes up and a lot of people adopt the product in a short amount of time. Finally it takes again a lot of time before the innovation is fully adopted in the relevant market.

### *3.3 Adopter Categories*

In addition to the diffusion curve there are five adopter categories estimated by Rogers (1995). Each category fits into the S-shaped curve and declares the shape. The five categories are as follows: the innovators, early adopters, early majority, late majority and laggards. The categories are divided in percentages over time:

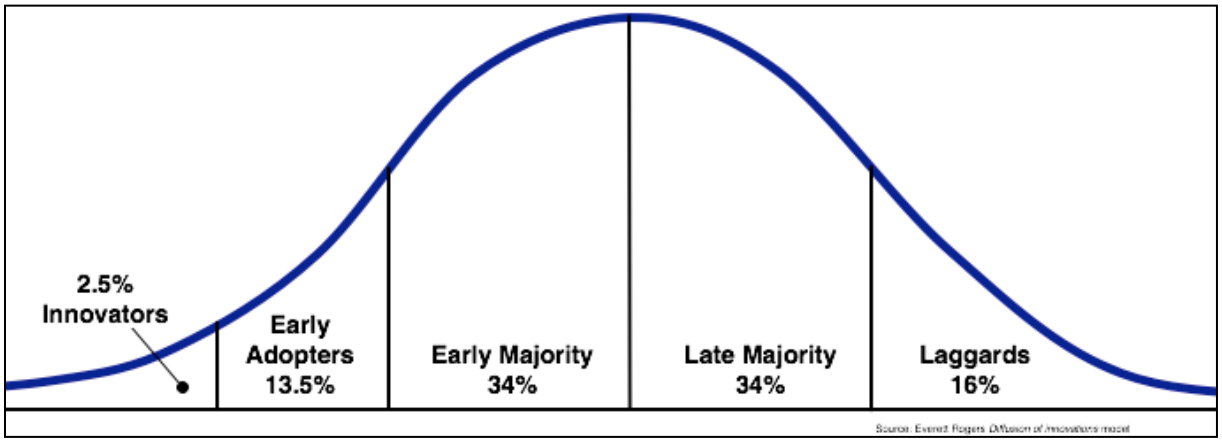



**Image 6: Adopter categories**

3.3.1 Innovators: The first category, the innovators, plays are very big role in the diffusion process. These people are willing to take the risk to buy very new items and show them to the rest of the world. Innovators appear to be young people, who have a solid social network. They are located in the highest social class and are connected to other innovators. Because 'new things' are some sort of obsession for these kind of people, they often form networks with each other. Finally, they should have lots of financial space to, in the first place, be able to buy the innovations, and in the second place, to cover the risk of failure. Because innovators want to have all the new things, they will not have large opinion leadership. People shall not believe an innovator when he says something is very good, because this person will say this about many items. Not many people are innovators.

3.3.2 Early Adopters: The second category, the early adopters, contains of the opinion leaders in a social system. They are young, successful people who are quite quick with the adoption of innovations. Just as the innovators are they located in high social classes, do they like some risk, have the early adopters a proper social network and should they have financial means to buy the new products. In addition to the innovators the early adopters have a high education. The biggest difference between the innovators and the early adopters is that the early adopters consider the innovations a bit more than the innovators. Therefore the failure rate is lower and is the opinion leadership much higher in this category. But just as with the innovators, not many people are early adopters. Usually people need to be convinced before they create a need and buy a new item.

3.3.3 Early Majority: The third category, the early majority, is a large group. It is the group that decides to adopt the innovation just before the average person of society does so. The early majority does not have a role as opinion leader, but has short ties with those leaders. They first need to be convinced that the innovation is good, before they decide to adopt it. These people are quite like the average person. They have a slightly above average social status and do not have lots of financial possibilities. The group is a bit more risk averse than the innovators and the early adopters.

3.3.4 Late Maturity: The fourth category, the late maturity, is a large group with people who decide to adopt the innovation right after the average person. A person in the late maturity only decides to adopt an innovation when it is necessary or under pressure of their social network. These people have an under average social status and will not have enough financial space. Therefore it is not quite possible for them to take lots of risks with buying innovations. The late maturity has barely any opinion leadership and their social network will probably exist of other members of this group, members of the early majority or the laggards. This group is very skeptical about the need of new items and is therefore quite risk averse.

3.3.5 Laggards: The last group, the laggards, is a small group of people who do not like change; they just want to keep things as they were. Laggards tend to be socially isolated and have the lowest social status. Usually laggards are the oldest people in the society. They do not know about innovations and they do not want to know about them. They think that they do not need the new items, because the old ones are doing well so far. This group is a relatively small category.

The description of the categories seems to be a quite logical partition of the population. Some people argue with this statement though. For instance Mahajan et al. (1990) wrote an article about the shortcomings of the model of Rogers. They concluded that the adopter categories can be developed by the use of other diffusion models (like the model of Bass). Nevertheless, the model of Rogers has some shortcomings, but it is very easy to use.

When both the S-shaped diffusion curve and the normally distributed curve of the adopter categories are computed together, a new graph arises. This graph shows very well how the population is divided and how long it takes before a group is fully adopted:

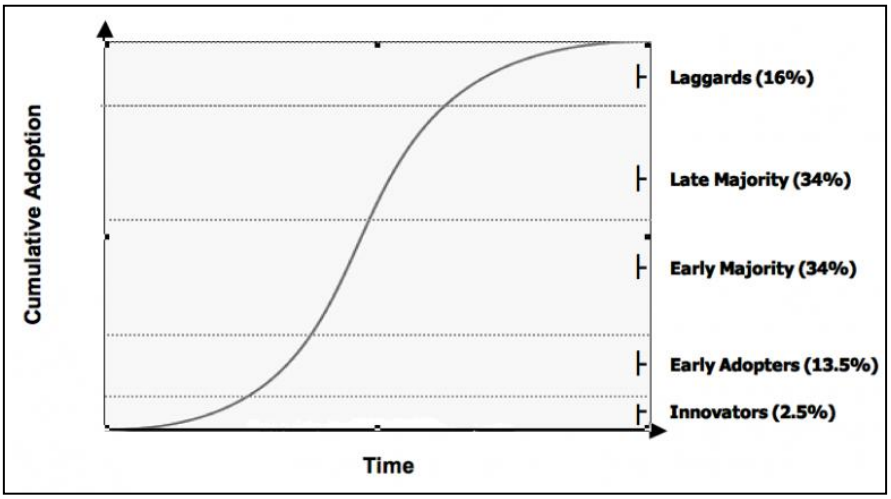



**Image 7: Combination of S-shaped curve and adoption categories**

The last graph shows very well why it is so important for companies to speed up the diffusion process: it just takes a lot of time before people are convinced to buy the innovation.

# 4. The Launch of an Innovation

If a company has developed an innovation of which they think they should launch because it has got a major chance to succeed, the process described before will start. This process can be divided into two parts, a side of the firm and a side of the customer. The company has to develop a marketing strategy which will, when done properly, attract the right customers for the new product. Next to this, the customer has to decide whether or not to buy the product. Both sides will be described in this chapter.

## *4.1 The Side of the Company*

Whether or not a person is going to adopt an innovation is dependent on a few things, which are different for each individual. Therefore it is very hard for a company to figure out how they should market their product the best way. To do this properly, markets and people should be very homogenous. When the preferences of people are 'the same', they shall adopt and buy the same products under the same circumstances; so a company only has to figure out how they could sell their product to one person. After the first buy, they could continue the strategy among all the other customers, who will buy it too. But, all people and markets are different and very heterogeneous. Therefore, a company should divide the market into different segments. Now they are able to reach the customers they want to reach and all these people are suspected to share a need for the new product; they are able to market the right customer. If for instance Gilette launches a new type of razor, the company only wants to reach men, as potential users, or women, to buy this new razor as a gift for instance for their partner. There is absolutely no reason for Gilette to target kids or women (as users). This process is, according to the University of Southern California, divided into three steps: segmentation, targeting and positioning:

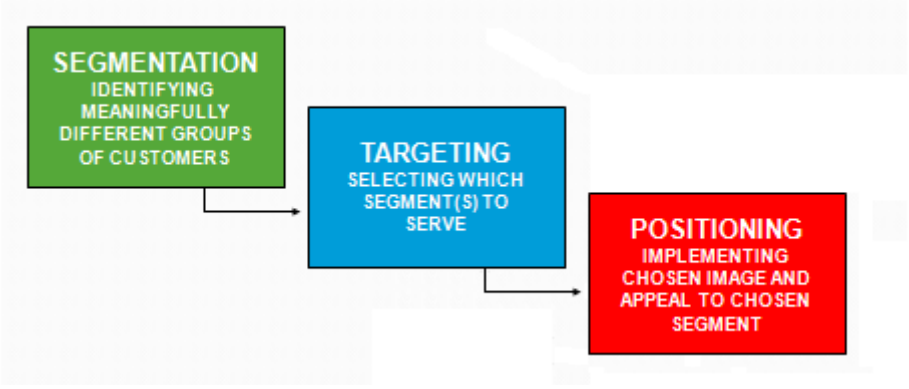



**Image 8: Segmentation, targeting and positioning**

4.1.1 Segmentation: The first part, segmentation, is identifying meaningfully different groups of customers. This means that a company should divide all the customers into slightly homogeneous groups, like the image on the right. The groups can be formed based on demographics (for example gender, age), geographic segmentation, social-economic segmentation (income, educational level) and behavioral segmentation (behavior, needs). Which kind of segmentation is necessary is dependent of the product. In the case of the example of Gilette, the group is easy to find. But when the new product is for instance a television, the segmentation process is harder. Besides the basis of segmentation, there are a few criteria to which each segment should meet. The segments should, according to NetMBA.com, be homogeneous, large enough, measurable, durable and accessible. Obviously, when a group is not homogeneous the customers would not react the same and the segmentation was not necessary. The same counts for groups that are not large, durable or accessible enough. Small groups are not profitable, groups that are not stable do not have to be made in the first place and groups that are not accessible are certainly not profitable, because they could not be reached. Finally, the segments should be measurable. Otherwise the company is not able to check whether the segmentation was done properly. If each segment is made properly, the segments should be targeted.

**Image 9: Segmentation**

**Image 10: Targeting**

4.1.2 Targeting: The second part, targeting, is selecting the segment(s) that should be served. This means that the firm should decide which segments that are made should be targeted for their new product. As said before, this process is completely dependent of the product. After the company made the decision which segments should be served, a marketing strategy can be made and the segments are ready to be served.

4.1.3 Positioning: The final part, positioning, is the implementation of the chosen strategy into the chosen segment. Whether this turns out positively is dependent of the first two steps and the message of the marketing strategy.

So, the chosen marketing strategy seems to be very important for a company when they want a customer to buy their product. According to Steenkamp & Gielens (2003), the marketing strategy and the marketing communication are positively related to the trail probability of an innovation. This implies that a very good strategy and proper communication of this strategy is able to motivate people to try out the new product. This is very positive for a company, because now many people will try the product and could be convinced of the advantages of this product.

After the company has developed the new product and decided which strategy to use, their job is done. Now the message will be spread amongst the market and after a while the first results will appear. If these results are positive, the innovation and strategy are received properly. When this is not the case, the firm has to decide whether or not to change the strategy or even stop producing the innovation. But after all, the task of the company is nearly over. On the other hand, the job for the customer starts at this point.

## *4.2 The Side of the Customer*

The lion's share of the diffusion process is of course dependent on the consumer. The consumer has to be put in touch with the new product and he / she has to decide whether or not to adopt and eventually buy the product via the process described before. Firms take into account that some customers would never buy the product, but within the targeted segments people have to make this decision. Customers have preferences that make them prefer some products over others. The strategy and brand of a company plays a big part in this process, but there are some personal characteristics that differentiate certain

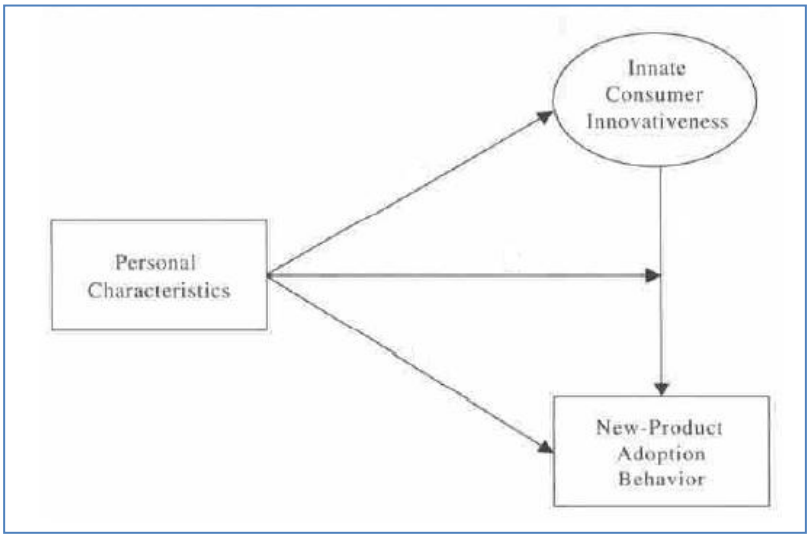



**Image 11: Relationships between factors**

people from each other. This process is described by Bayus & Mason (2003). According to image 11, the different paths are explained.

At the basis there are the 'Personal Characteristics', this are personal factors that could be different for each individual. This could be for instance: age, gender and income, but living place and social status as well. These factors indicate who you are towards the world and influence the two following stages. The second stage is the 'Innate Consumer Innovativeness'. The definition for this concept is: 'the degree to which an individual adopts innovations relatively earlier than other members in his or her social system' (Rogers & Shoemaker, 1971). According to Bayus & Mason (2003), Midgely & Dowling (1978), Steenkamp et al. (1999) and Im et al. (2007) the consumer innovativeness is influenced by the personal characteristics of someone. The main conclusions of these authors are that income and education are positively related to consumer innovativeness and age negatively. The last stage is New-Product Adoption Behavior. This stage describes whether a consumer adopts the new product or not and is influenced by both the first two stages. The authors mentioned above found quite the same results as between the two first steps, only Im et al. found not a direct, but an indirect relation between consumer innovativeness and new-product adoption behavior. They found that this relationship is dependent on the marketing and word-of-mouth advertising around the product.

It appears that personal characteristics are a very important factor in the adoption process of innovations. Companies counter this to divide the market into segments of specific characteristics. Besides those features, firms are aiming on the so called lead users and opinion leaders. Lead users are people, often in B2B markets, who cooperate with companies to test and improve the innovations. Opinion leaders are people in the B2C markets, who have large opinion leadership. Therefore many others like to get information from these people, or simply copy their buying behavior. If companies are able to attract those people, it will gain a lot of time. In the rest of the thesis the focus will be on the B2C market, so only opinion leadership will be covered.

# 5. The Rate of Diffusion

Usually it will cost a company lots of time and money to make up an innovation and launch it to the marketplace. Therefore is it useful for companies to speed up the diffusion process, because the innovation will become profitable sooner. Since the individual adoption process is not very stable and therefore not very controllable, it is very difficult to imagine how firms are able to increase this rate of diffusion. Gatignon & Robertson (1985) present a few propositions in their article, which describe the factors that influence the rate of diffusion.

In the article the authors mean by the rate of diffusion 'the speed at which sales occur over time'. The first proposition mentioned describes the marketing expenditures of a firm. They state that the more marketing expenditures happen, at a sensitive marketing program at different segments of the process, the faster the diffusion will go. This means that a clear message should be created and that people need to see the message many times at the right time. The second proposition contains the assumption that a lot of competition amongst firms will lead to a faster rate of diffusion. Though, the competitors need to use the same technologies, otherwise the customers will get confused. The third proposition describes the influence of the five perceived characteristics of an innovation: relative advantage, compatibility, complexity, trialability and observability. These characteristics are related to the rate of diffusion like described before; they are all positively related to the speed of diffusion except for complexity. Besides this, an extra factor: risk, is introduced. This sixth characteristic is negatively related to the rate of diffusion too. Finally, the last proposition states that the speed of diffusion is effected by the possibility of learning effects for the customer. When a consumer is able to develop new knowledge and experience about the new product, they are more likely to try it once and therefore increase the speed of diffusion.

In the article no actual personal characteristics are related to the rate of diffusion, but it is clear that the same characteristics that indicate whether or not a person is innovative have an effect on this rate. When people are likely to be more innovative, they are more likely to buy new products. Therefore they will speed up the rate of diffusion. In the article of Valente & Davis (1999) a personal factor is mentioned: opinion leadership. In their article they state that interpersonal contacts are important influences on adoption behavior. They found that opinion leaders can be created in five ways: they can select themselves, they can be chosen by a firm, each member can recruit another (snowball effect), some people out of the population can nominate others or all the members of the population can nominate others. This is different than the mindset that opinion leaders just 'exist'.

# 6. Hypotheses

In the previous chapters the different kinds of innovations and adopters, the diffusion and adoption process and the influences on the company and the consumer by the launch of an innovation are discussed. It is very clear that a lot of research has been done in these sectors of the field of innovations. According to this research companies are more able to efficiently introduce their innovations to the market. The research gives a really good insight in the structure of a market and the processes at an individual level. Now firms know what the customer has to go through before he or she decides whether or not to buy the product and what the main differences are between the main categories of people in the market. Therefore firms are more and more able to launch innovations efficiently. Unfortunately, the market has changed lately.

Many years ago companies tried to produce as many products as possible. Therefore, all the products were quite alike. In this time of mass production, the taste of a consumer was not an item at all. After a while, some firms would differentiate themselves from the rest and started to change their products slightly to the wish of the customer. In reaction to this trend many more companies tend to adapt their products to the customer and the time of segmentation dawned. At this point, the research ends. Companies need to divide the market into segments they would like to serve. But, how do you do this properly? The diffusion theory and the adopter categories are based upon the relevant market, but only companies with experience in this market could have an idea how this market looks like. For new entrants it is very difficult to divide the whole market into segments, because they are not familiar with the relevant market. At the moment more and more products are launched that are for instance only for men, for sports fans, for elderly people or for children. It is obviously very easy for a company to decide how to divide the market into segments for these products. But on the other hand, it is could be difficult to understand how the diffusion process works in these small segments and how firms are able to speed up the diffusion process over there. The diffusion theory of Rogers can be used for all sorts of segments, but perhaps some specific groups will react different than others. So, according to Rogers (1995), the five adopter categories are presented in all possible relevant markets.

In my research I would like to aim at a very special group, people from 15 up to 25 years of age: the youngsters. In my opinion this is a very interesting category because the needs of young people are quite similar. Young people go to school and because of this they have a lot of social contact with other young people. There is a high degree of groups of people at school and to belong to some sort

of group, people have to fit in. So, a lot of young people like exactly the same products as others and they tend to talk a lot about this to each other. Of course there are many different kinds of groups, but within these single groups the needs of people like to be quite the same. Therefore, youngsters form a relevant market for a lot of products. But it is very difficult to predict which person belongs to a certain adopter category. The categories are distinguished from each other based on a few items: age, income, social network and status, education and risk (Rogers, 1995). According to age and social network, young people should belong to the first two categories, but based on social status, education and risk, they could belong to each of the five categories. Finally, income is quite low for young people. Therefore they should fit in the last two stages of the figure described by Rogers. On the other side, the formation of groups with people who have the same wants and needs leads to a lot of social pressure. When someone who belongs to a group does not have a product that others do have, he or she could quickly feel embarrassed that he or she does not have this product. This will lead to the mindset that only a few laggards exist within this relevant market, because young people have to adopt innovations quickly due to this social pressure. But, young people tend to have a low income too. Therefore, some youngsters could be unable to buy an innovation as soon as they have adopted it. This means that there is a possibility that the innovators will not be able to buy the innovation as quick as they actually want to.

The social pressure leads to a situation where everyone wants to have the innovation relatively quick, but the financial issue leads to a situation where everyone buys a new product relatively late. These two extreme situations lead to the assumption that there should only exist two categories. Everyone wants to have the new product, but only some people are able to buy the innovation right away and the others have to wait until they have enough money. So, within certain groups of youngsters not all the adopter categories are likely to be present. Though, with all the little social groups combined there are probably some groups that adopt an innovation earlier than others. Therefore the five adopter categories of Rogers (1995) are present. This leads to my first hypothesis:

**H1:** ***Under youngsters there exist five adopter categories as suggested by Rogers, accompanied with the distribution percentages of the different categories.***

Many producers often try to create a craze under young people. If that happens, huge sales are guaranteed and this happens very quickly. Assuming that almost everyone will buy the product makes those crazes very positive for a company. But how should producers know how to create one? When we revert to the social network of young people and the high degree of groups, it is likely to propose that there are a few people who decide whether or not to buy an item in the first place.

After these people bought the product the other group members will follow. In the theory of Rogers these people are called the opinion leaders. Here I will follow the theory of Rogers (1995) and not the one of Valente & Davis (1999), because the theory of Rogers is based on the real world while the other article is written more to describe and confirm the influence of opinion leaders. Besides the use of a particular model, researchers disagree with each other if opinion leaders are always the same people. It is easy to imagine that some people are experts in for instance electronics and others in fashion. The rest of the group asks for their opinion about new products in a specific area of interest. Therefore is not always the same person the right opinion leader for a certain product. Besides this it is questionable if the effect of opinion leadership is the same amongst different product categories. It is not likely that the influence on cheap products is the same as on very expensive products, according to the different impact of the status. This leads to my second hypothesis:

**H2:** ***Within groups of young people there exist a lot of opinion leaders, but the effect of opinion leadership differs amongst different product categories.***

Opinion leaders like to talk a lot with other people about new products. They enjoy giving their opinion about these innovations. Therefore it is, assuming that there are opinion leaders among groups of young people, logical to expect that these opinion leaders like to have new products as soon as possible. Only if they have a new product, they are able to demonstrate their opinion leadership. Once they fall behind, others will not listen any more to their opinion. This means that opinion leaders are likely to have a short adoption time in their area of interest. Therefore the influence of opinion leadership on the rate of diffusion could be different for various product categories. Nevertheless, Steenkamp & Gielens (2003) found no significant influence, which means that the influence was too small in that study. However, they expected a positive influence, like myself, so my third hypothesis is:

**H3:** ***Being an opinion leader influences the personal rate of adoption positively.***

Whether or not there exist opinion leaders in the category mentioned, it is very important for companies to understand the market they are dealing with. Only if they know who are buying their products, they will be able to take steps to increase to rate of diffusion. Within the group of young people there are, just like in the article of Gatignon & Robertson (1985), a few product factors that ought to influence the rate of diffusion. But next to these factors that are adaptable by the firm, there are some personal factors. The most obvious ones are the personal characteristics mentioned

at the differentiation of the adopter categories: age, income, social network and status, education and risk. In addition to the ones mentioned, the characteristic gender could be important too.
The social network would not be applicable, because this is likely to be the same amongst the members of groups of young people. The preferences of kids are largely determined by their friends. All those friends usually belong to the same group, so their social network is quite the same. Of course people can belong to multiple groups of friends, but their taste is influenced the most by the people they hang around with the most often. The group someone spends the most time with is usually the group of friends at school. People that go to the same school and have the same educational level, usually have the same social status: friends are equals. However, some friends have more status than others. Some people are opinion leaders; they give their opinion about for instance clothing and gadgets. They have a higher status than other group members. Besides this, there are friends that value the opinion of others highly. They are very susceptible to normative influence (SNI), so it is likely that those people have less status then the others. Because there are differences in social status between group members, this factor can be very important at that age. The category risk is not likely to be important. In the field of diffusion, risk is dependant of the amount of income someone has got. Young people often do not have a lot of financial means, so risk can be locked-out. But people with a high SNI are likely to be more risk averse.

It is likely to believe that the factor age could be excluded, because the differences within this particular range of age should be insignificant. Though, in previous research, by for instance Bayus & Mason (2003), the factor age has a highly significant negative effect on the new product buying behavior. Therefore the factor cannot be excluded from the model. But still, the range of age is so small that a significant influence is out of expectation. Also the factor gender is not likely to have a significant influence on the rate of diffusion. The adoption time between boys and girls can differ between certain products, but when they both want to have a product the adoption time their behavior is expected to be the same. The last two factors that are included in the model are income and education. According to the research mentioned by Bayus & Mason (2003) both these two factors are likely to increase the personal rate of adoption. In their research only the factor income appeared to have a significant positive effect on new product buying behavior, but many others found the same effect with education. This leads to the fourth hypothesis:

**H4:** ***The personal characteristics age and gender do not influence the personal rate of adoption, but income and education increases it.***

Next to the personal characteristics there is another personal item that is likely to influence the rate of diffusion. This is the innate personal innovativeness. The personal innovativeness indicates how quick consumers adopt innovations compared to the others in their social system (Rogers & Shoemaker, 1971). Someone is innovative if he or she likes to have new products and likes to take some risk to buy them. Obviously, the more innovative someone is, the higher the rate of adoption should be. This is proved by Bayus & Mason (2003) and Steenkamp & Gielens (2003). But are young people able to be innovative? Of course the concept itself gives the answer to this question, because it is *innate* innovativeness. People are born that way. But the question is more whether a young person is able to behave like he or she would like to. At this point the social and financial issues are coming up. Now the social issue is less likely to be dominant, but it can be important. Still it is likely that the more innovative someone is, the higher the rate of adoption should be. The same direct positive effect is found by Bayus & Mason (2003). This leads to my fifth hypothesis:

**H5:** ***Innate personal innovativeness increases the personal rate of adoption.***

One factor that seems to be very important in the segment of young people is the social pressure that could be very high in groups of friends. People are afraid of disappointing the rest of the group by their actions, because the consequences could be huge to their social life. Therefore it is reasonable to add this factor as an indicator of the rate of diffusion into the model: the susceptibility to normative influence (SNI). If someone is very susceptible to the opinion of other group members, he or she is very afraid to buy something wrong that is not approved by the crowd; they value the opinion of the group highly. This would slow down his or her adoption rate enormously. Someone needs more time to gather information about to product and to figure out the opinion of others about this product. The same negative effect is found by Steenkamp & Gielens (2003). This leads to my sixth hypothesis:

**H6:** ***Susceptibility to normative influence leads to a decrease of the personal rate of adoption.***

The last four hypotheses lead to the following figure:

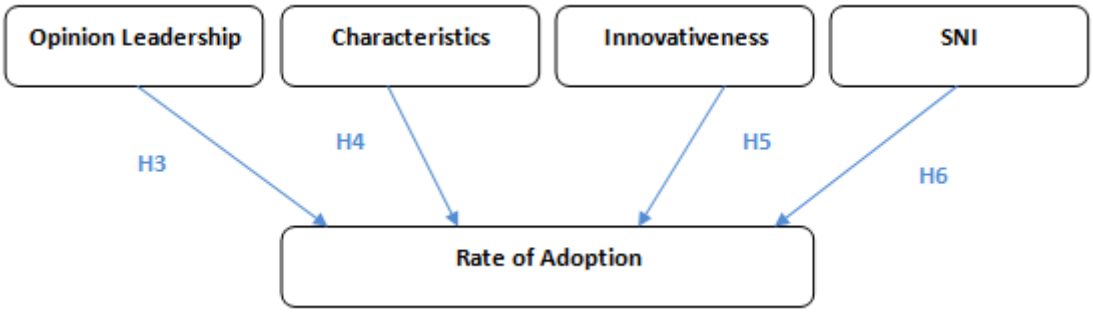



**Image 12: Hypotheses**

It is very unlikely that this figure is complete. To start, there are some very important other variables that have a major influence on the personal rate of adoption. Those are for instance the product itself and the factors mentioned by Gatignon & Robertson (1985). Country effects are, according to Steenkamp et al. (1999), important too. But next to this, it is very reasonable to consider cross links between the variables itself. It is very likely that personal characteristics and innovativeness have some influence on whether or not someone is an opinion leader. Besides this it is possible that personal characteristics have no direct influence on the personal rate of adoption, but for instance only via the personal innovativeness and the opinion leadership of a customer. Therefore some additional hypotheses will follow.

It is very likely that the three other factors mentioned are influenced by the personal characteristics as well. However, according to the research of Wiedmann et al. (2001) there is no connection between age, gender, education and opinion leadership. Therefore it is likely to believe that income has no influence too. According to for instance Bayus & Mason (2003) and Midgely & Dowling (1978) personal innovativeness is influenced positively by income and education and negatively by age, just as mentioned in H4. Therefore the same results are expected over here: the effect of age will be insignificant because the range is too small, the effect of gender will be insignificant because boys and girls are supposed to act the same and income and education will have a positive effect on personal innovativeness.

The final factor, SNI, is not likely to be heavily dependent on personal characteristics. Some people are very insecure about themselves, but this is should not be influenced by personal factors. According to Mangleburg et al. (2004), age is negatively related to the SNI of teens. However in this study only the oldest half of the teens and older people are taken into account. Therefore the SNI should be more stable and is there probably no relation. A study of Girard (2010) found that females are more susceptible to normative influence. Therefore this effect is expected here too. Finally, Batra

et al. (2001) found that there is no relationship between SNI and income or education. This leads to the following hypotheses:

**H7:** ***The personal characteristics age, gender, income and education do not influence opinion leadership.***

**H8:** ***The personal characteristics age and gender do not influence the personal innovativeness, but income and education influences it positively.***

**H9:** ***Neither the personal characteristics age, income and education influence the susceptibility to normative influence of people, but females are more susceptible to normative influence then males.***

The figure now looks like this:

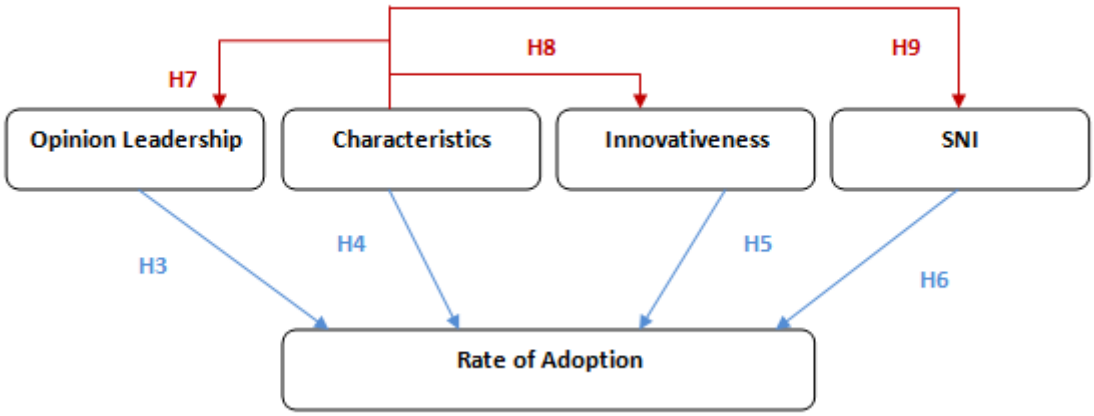



**Image 13: Hypotheses**

In this figure there are only missing three links to complete it. These are the links between opinion leadership and uncertainty, opinion leadership and innovativeness and susceptibility and innovativeness. It is very likely that there is a negative link between opinion leadership and susceptibility, because people who are not sure of their position in a group should not be the opinion leaders. This link is found by Steenkamp & Gielens (2003). Next to this, it is likely that there is a strong positive connection between innovativeness and opinion leadership. Opinion leaders have to be an expert in their area of expertise; otherwise other people would not accept them as an opinion leader. Therefore they should be aware of the innovations in this area. If someone does not like new

products he or she still can be an opinion leader, but others stop listen to this person if it appears that other products are better after all. Therefore opinion leaders are likely to be innovative people. The link is found by Steenkamp & Gielens (2003) too. The last connection is less clear. People can be very innovative, but at the same time very uncertain and afraid to show it to the world. It is reasonable to think that innovativeness of a person plays a more dominant role. If somebody really likes to have new products, he or she does not care what the opinion of others is about this. Therefore personal innovativeness indicates a low susceptibility to normative influence. Steenkamp & Gielens (2003) did found a significant effect, but it was very small. This will lead to the following hypotheses:

**H10:** ***Susceptibility to normative influence is negatively related to opinion leadership.***

**H11:** ***Innovativeness is negatively related to susceptibility to normative influence.***

**H12:** ***Opinion leadership is positively related to innovativeness.***

Now the image is complete:

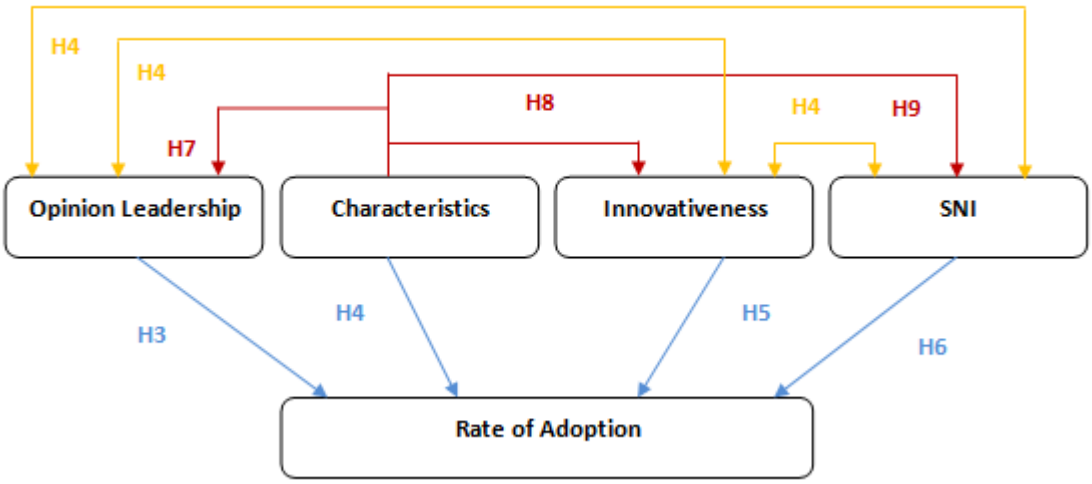



**Image 14: Hypotheses**

These twelve hypotheses will be tested on a new product, a new model of jeans. After this is done, the hypotheses will be tested on a second product, a new flavor of coke, to check if the theory holds for low involvement products. Finally, the hypotheses will be tested on a third product, a new iPod. With this product there could be checked if the theory holds for a replacement purchase decision too. All the hypotheses will be checked on both direct as indirect (interaction) effects. With these answers it should be possible to give a solid answer to the main question.

# 7. Data Collection

To test the hypotheses, a dataset is created by the means of a survey. First, all the loose hypotheses will be tested to check whether or not the factor is influential on each different product. Therefore, only small regressions will be done. After this a multiple regression will be done to answer the questions.

## *7.1 Source of the Data*

The survey is answered by 115 individuals that are between 15 and 25 years of age. Because all the people are approached via my own network, almost all the people live in Utrecht or Rotterdam and have quite a high educational level. This makes it very hard to generalize the outcomes, because the data is not very representative. Nevertheless, clear conclusions can be made with the means of this dataset.

## *7.2 Composition of the Data*

Each of the participants had to answer twenty seven different questions. The first four questions are about themselves; gender, age, education level and income level. Age is measured in years and income level in five categories. Education level is measured in eight different levels, but because almost everyone answered 'VWO' (high school) or 'WO' (college) the results are changed into high and low. High is VWO and WO and low is the rest. After those questions, another twenty questions followed to indicate the level of innovativeness, opinion leadership and SNI of that individual. To do this properly, the questions of Steenkamp & Gielens (2003) were used. To measure the level of innovativeness and SNI, eight propositions were given were people should indicate if they agreed or disagreed with this proposition on a five-point Likert scale. To measure the opinion leadership of an individual, four of those propositions were presented to the participants. When all these questions are combined, three factors could be created: personal innovativeness, opinion leadership and SNI. Finally, three questions are asked to indicate the personal rate of adoption for different products. The three products are about a totally new product, a new type of jeans, a new low involvement product, a new flavor of coke, and a new product where a replacement purchase decision is necessary, a new type of iPod. The questions could be answered on six different levels, running up form very quick to very slow. So a high score means a higher adoption time. These different levels are chosen to be like the boundaries of the adopter categories of Rogers.

### *7.3 Method*

With the gathered dataset, all the hypotheses can be answered in three ways. First, the first six hypotheses will be tested on the new product purchase decision. For the first hypothesis, the answers to the questions about the purchase decision of the jeans will be pictured in a graph and tested for a normal distribution. According to this, it will be clear if the theory of Rogers is supported. Though, a solid conclusion cannot be made since the categories could be different from the boundaries which are set by Rogers. For hypothesis two, the answers to the four questions about opinion leadership are merged and divided by four. The results are pictured in a graph. Now it becomes clear whether or not there are opinion leaders in the sample. The results of hypothesis three are used to answer the second part of this hypothesis.

At this point the real analysis starts, so the dataset was screened for unusable responses and the scores for some questions were rescaled. All the questions were measured on the agree – disagree scale, but some questions were reversed scored. Therefore this rescale was necessary. Next to this are the questions that measure personal innovativeness, SNI and opinion leadership rescaled as well. Now they are changed into the disagree – agree scale. At this point the dataset was ready to be used.

Because a lot of questions were asked to the respondents to check on innovativeness, opinion leadership and SNI, a factor analysis is used to create the factors that are needed for the tests. After the first factor analysis, some questions needed to be deleted. SNI loaded perfectly into one factor, but the questions about opinion leadership and innovativeness were mixed into five factors. After the removal of these items, the essential factors were formed and three factors could be used.

The rest of the hypotheses can be tested by the means of the factors that were created. These factors and the personal characteristics will be tested individually to the dependent variable, the question about the jeans, to check whether or not the influence is significant. After this is done, a multiple regression analysis is done to answer the hypotheses. The same steps will be done again, to check if the results are the same for a low involvement product buying decision and a replacement buying decision. The last six hypotheses will be tested the same way, but then with the independent factors used as dependant variables.

# 8. Results

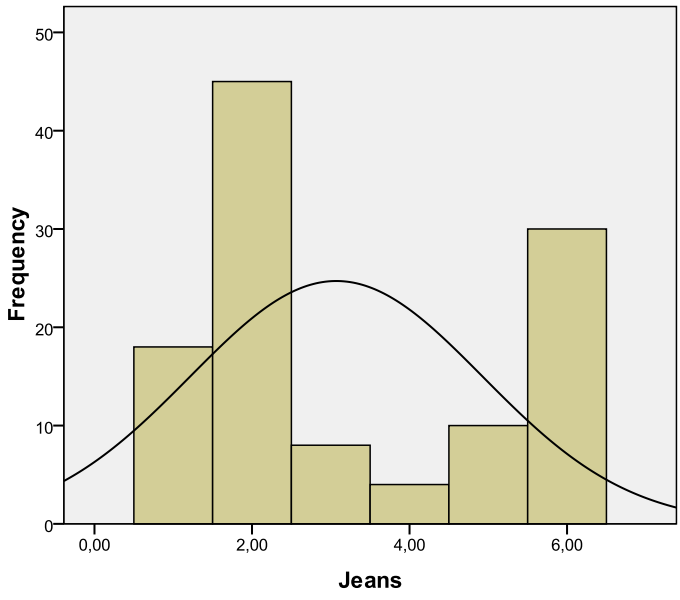
After enough people responded to my appeal of filling in the survey, the hypotheses are ready to be tested. The hypotheses are tested on three different levels. The first level is the new product decision.

## *8.1 New Product Buying Decision*

The first hypothesis searches for a confirmation that the known theory of Rogers could be applied to the selected group. To test this, the results of the questions of the questionnaire where the respondent was asked to make a buying decision will be tested on a normal distribution. When this distribution is found, the hypothesis is supported.

The first graph, which shows the results of the jeans, shows that the results are widely spread into two types: quick adoption and no adoption. Also the non-adopters (people who answered that they would not buy the product) are pictured, because they are part of the relevant market since all young people are supposed to wear jeans. Although the graph makes it very clear that this factor is not normally distributed, the Shapiro – Wilk test supports this answer statistically. The outcome of the test gives a 0,000 significance level, so it is clearly not normally distributed. This means that the theory presented by Rogers in 1995 is not supported by this data.

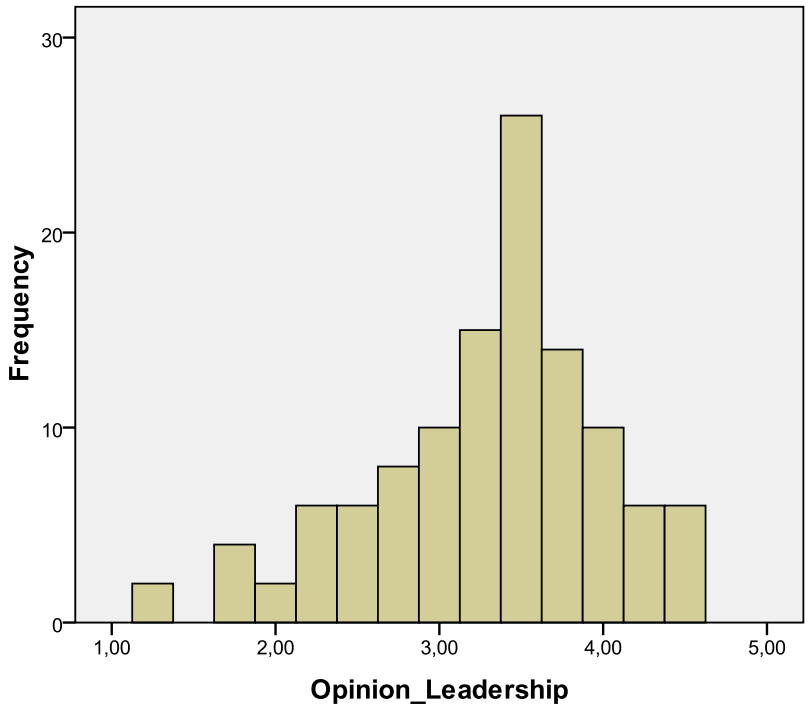
**Graph 1: Distribution of New Product Buying Decision**



It could be possible that there are five different adopter categories, but the accompanying distribution percentages are not found over here. The first part of the hypothesis cannot be rejected, because the exact number of categories cannot be determined by statistics. According to the graph it is not likely that this number is five. The second part of the hypothesis can be rejected. The Shapiro – Wilk test proved that the data is not normally distributed, so the percentages presented by Rogers (1995) are not found over here.

The second hypothesis is about the existence of opinion leaders under young people. This could be shown by the means of a frequency histogram. The answers of the four questions about opinion leadership are added up and divided by four. Now the opinion leadership per respondent is visible. This results in the second graph:

**Graph 2: Opinion Leaders**




The graph clearly shows that the most people are located at the right side. This means that there are indeed lots of opinion leaders amongst young people. However, there are not many respondents who are labeled as a complete opinion leader (people that answered option 5 by all four questions). But 22 out of the 115 people scored an average of four or more out of these questions. This means that about 20% answered to be an opinion leader, what is a very large amount. So, there seem to exist lead users in groups of young people and there are even more of them than the usual amount in a population. The first part of hypothesis two is supported by the data. The second part will be tested later on.

The third, fourth, fifth and sixth hypothesis are about finding a relationship between the different variables and the purchase decision of a new product. To do so, the dependant variable and the factors will be added individually into different models. These simple regression models revealed significant results for gender (0,000), age (0,012), income (0,003) and innovativeness (0,008). For the other factors insignificant results were found.

To test the hypotheses a multiple regression is used. The expectation is that no other factors will give significant results than the ones that are mentioned above, but the regression is done with all the factors included. Also the interaction terms Personal Innovation * Opinion Leadership, Personal Innovation * SNI and SNI * Opinion Leadership are included. There is a possibility that some factors that were insignificant tend to be significant when they are added to the model together with other variables or the interaction terms. After the first regression the most insignificant variable was excluded and a second regression was done. Now again the most insignificant variable was removed. This process was repeated until all the variables were significant. The results for the new product buying decision are presented in table 1.

**Table 1: Multiple regression function for a new product buying decision**

| | ***Unstandardized coefficient*** | ***T-Value*** | ***R*** | ***Significance*** |
|---|---|---|---|---|
| Constant | 2,089 | 8,549 | | 0,000 |
| Gender (1 = male) | 1,996 | 6,211 | 0,511 | 0,000 |
| Innovativeness | -0,677 | -3,856 | -0,352 | 0,000 |
| Opinion Leadership | 0,560 | 3,095 | 0,291 | 0,003 |
| SNI | -0,443 | -2,770 | -0,230 | 0,007 |
| Innovativeness * SNI | 0,323 | 2,201 | 0,232 | 0,030 |

The dependent variable is the buying decision of the jeans; the higher the outcome gets, the slower the rate of adoption is. The independent variables are coded the other way around; the higher one scores on for instance innovativeness, the more innovative he or she is.

The final model consists out of five of the ten possible variables which are all significant at a significance level of 5%. The results in the table show that there is indeed a difference with the results of the simple regression. The factors opinion leadership and SNI are significant in the complete model and the factors age and income are not included. It seems to be that the influence of opinion leadership and SNI is stronger in combination with other factors and that the influence of age and income is taken over by other variables.

The standardized b-values (R) show the effects of the different variables directly comparable to each other. So, girls, people who are innovative, people who are no opinion leader and people who are very susceptible to the normative influence will buy this new jeans earlier than boys, less innovative people, people with more opinion leadership and people who are less susceptible to the normative influence. Also the interaction effect of the variables innovativeness and SNI is significant. This term indicates that people who are not innovative and not susceptible to the normative influence hesitate an extra bit longer when they have to buy this new product.

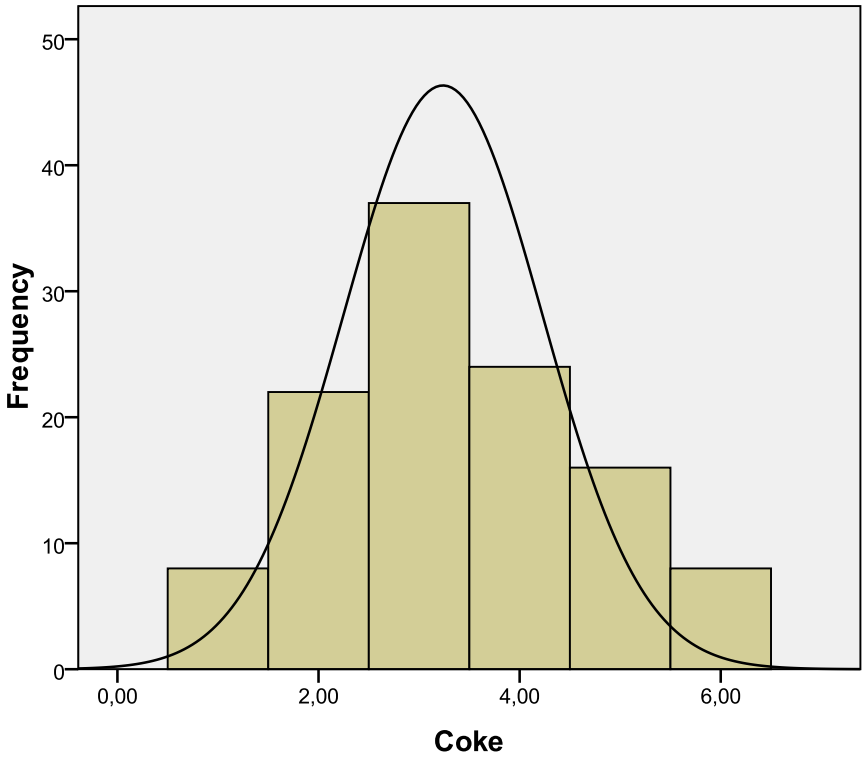
To conclude the results of the model of the new product buying decision; support is found for hypothesis two (first part), four (only the variable age) and five, since the characteristic age does not influence the purchase decision and the variable innovativeness influences it positively. All the other hypotheses are rejected. The adoption categories are not normally distributed, opinion leadership has a negative effect on the personal rate of adoption, gender has an influence on the speed of adoption, income and education are insignificant and SNI has a positive influence on the personal rate of adoption.

### *8.2 Low Involvement Product Buying Decision*

Now all the hypotheses are tested on a new product buying decision, the same hypotheses will be tested with a new low involvement product to see if the theory is applicable here too and whether or not the results are different. The results for hypothesis one are shown in graph 3.

The graph, which shows the results of the coke, looks quite well normally distributed. Just like with the jeans, also the non-adopters (people who answered that they would not buy the product) are pictured. They are part of the relevant market since all young people are supposed to drink coke. But, according to the Shapiro – Wilk test, the data is not normally distributed with a significance level of 0,000. This means that the theory presented by Rogers in 1995 is not supported by this data. It could be possible that there are five different adopter categories, but the accompanying distribution percentages are not found over here. The first part of the hypothesis cannot be rejected, because the exact number of categories cannot be determined by statistics. According to the graph it is not likely that this number is five. The second part of the hypothesis can be rejected. The Shapiro –Wilk test proved that the data is not normally distributed, so the percentages presented by Rogers (1995) are not found over here.

**Graph 3: Distribution of New Low Involvement Product Buying Decision**




To find an answer to hypotheses three, four, five and six, again a simple and a multiple regression are done. The simple regression models only revealed significant results for age (0,037) and innovativeness (0,000). For the other factors insignificant results were found.

To test the hypotheses a multiple regression is used. The expectation is that no other factors will give significant results than the ones that are mentioned above, but the regression is done with all the factors included. Also the interaction terms Personal Innovation * Opinion Leadership, Personal Innovation * SNI and SNI * Opinion Leadership are included. There is a possibility that some factors that were insignificant tend to be significant when they are added to the model together with other variables or the interaction terms. After the first regression the most insignificant variable was excluded and a second regression was done. Now again the most insignificant variable was removed. This process was repeated until all the variables were significant. The results for the new low involvement product buying decision are presented in table 2.

**Table 2: Multiple regression function for a new low involvement buying decision**

| | ***Unstandardized coefficient*** | ***T-Value*** | ***R*** | ***Significance*** |
|---|---|---|---|---|
| Constant | 1,079 | 0,929 | | 0,355 |
| Age | 0,152 | 2,536 | 0,242 | 0,013 |
| Income | -0,389 | -3,708 | -0,338 | 0,000 |
| Innovativeness | -0,353 | -3,165 | -0,267 | 0,002 |
| Opinion Leadership | -0,228 | -2,202 | -0,173 | 0,030 |
| SNI | -0,279 | -2,404 | -0,211 | 0,018 |
| Opinion Leader * SNI | 0,512 | 4,513 | 0,561 | 0,000 |
| Innovativeness * OL | -0,429 | -3,456 | -0,443 | 0,001 |

The dependent variable is the buying decision of the coke; the higher the outcome gets, the slower the rate of adoption is. The independent variables are coded the other way around; the higher one scores on for instance innovativeness, the more innovative he or she is.

The final model consists out of seven of the ten possible variables which are all significant at a significance level of 5%. The results in the table show that there is indeed a difference with the results of the simple regression. The factors income, opinion leadership and SNI are significant in the complete model. It seems to be that the influence of income and SNI is stronger in combination with other factors and that the effect of none of the other variables is taken over by other variables.

The standardized b-values (R) show the effects of the different variables directly comparable to each other. So, younger people, people who have more income, people who are innovative, opinion leaders and people who are very susceptible to the normative influence will buy this new flavour of coke earlier than older people, people with less income, less innovative people, people with less opinion leadership and people who are less susceptible to the normative influence. Also the interaction effects of the variables opinion leadership and SNI and of the variables innovativeness and opinion leadership are significant. This terms indicate that people who are no opinion leader and not susceptible to the normative influence and people who are not very innovative and have less opinion leadership hesitate an extra bit longer when they have to buy this new product.

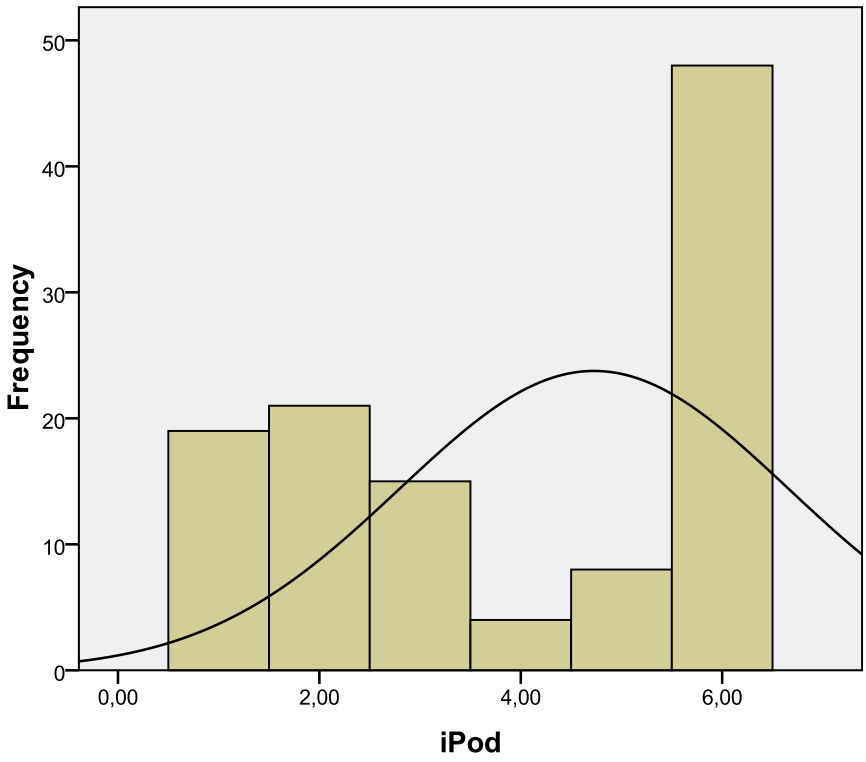
To conclude the results of the model of the new low involvement product buying decision; support is found for hypothesis three, four (the variables gender and income) and five, since opinion leadership has a positive influence on the personal rate of adoption, the characteristic gender does not influence the purchase decision, income increases the personal rate of adoption and the variable

innovativeness influences it positively. All the other hypotheses are rejected. The adoption categories are not normally distributed, age has an influence on the speed of adoption, education is insignificant and SNI has a positive influence on the personal rate of adoption.

### *8.3 Replacement Purchase Decision*

Finally, the hypotheses are tested on al replacement buying decision. By the means of this study, it becomes clear if the theory is applicable here too and whether or not the results are different. The results for hypothesis one are shown in graph 4. Also the non-adopters (people who answered that they would not buy the product) are pictured, because they are part of the relevant market since all young people are supposed to have a need for an iPod (mp3 player).

**Graph 4: Distribution of a Replacement Purchase Decision**




The graph, which shows the results of the decision to buy an iPod after the old one broke down, looks totally not like a normal distribution. This is supported by to the Shapiro – Wilk test, because the data is not normally distributed with a significance level of 0,000. This means that the theory presented by Rogers in 1995 is not supported by this data. It could be possible though that there are five different adopter categories, but the accompanying distribution percentages are not found over here. The first part of the hypothesis cannot be rejected, because the exact number of categories cannot be determined by statistics. However, according to the graph it is not likely that this number is five. The second part of the hypothesis can be rejected, because the Shapiro –Wilk test proved that

the data is not normally distributed. So, the percentages presented by Rogers (1995) are not found over here.

To find an answer to hypotheses three, four, five and six, again a simple and a multiple regression are done. The simple regression models revealed significant results for gender (0,030), age (0,001), innovativeness (0,001) and opinion leadership (0,028). For the other factors insignificant results were found.

To test the hypotheses a multiple regression is used. The expectation is that no other factors will give significant results than the ones that are mentioned above, but the regression is done with all the factors included. Also the interaction terms Personal Innovation * Opinion Leadership, Personal Innovation * SNI and SNI * Opinion Leadership are included. There is a possibility that some factors that were insignificant tend to be significant when they are added to the model together with other variables or the interaction terms. After the first regression the most insignificant variable was excluded and a second regression was done. Now again the most insignificant variable was removed. This process was repeated until all the variables were significant. The results for the replacement buying decision are presented in table 3.

**Table 3: Multiple regression function for a replacement buying decision**

| | ***Unstandardized coefficient*** | ***T-Value*** | ***R*** | ***Significance*** |
|---|---|---|---|---|
| Constant | -1,688 | -1,017 | | 0,311 |
| Gender (1 = male) | -1,239 | -3,635 | -0,301 | 0,000 |
| Age | 0,302 | 3,791 | 0,313 | 0,000 |
| Innovativeness | -0,534 | -3,239 | -0,263 | 0,002 |
| Opinion Leadership | -0,522 | -3,155 | -0,257 | 0,002 |

The dependent variable is the buying decision of the iPod; the higher the outcome gets, the slower the rate of adoption is. The independent variables are coded the other way around; the higher one scores on for instance innovativeness, the more innovative he or she is.

The final model consists out of four of the ten possible variables which are all significant at a significance level of 5%. The results in the table show that there is no difference with the results of the simple regression; all the variables that were significant at the simple regression are significant here too. It seems to be that the influence of none of the variables is stronger in combination with other factors and that the effect of none of the other variables is taken over by other variables.

The standardized b-values (R) show the effects of the different variables directly comparable to each other. So, boys, younger people, people who are innovative and opinion leaders will buy this new kind of iPod earlier than girls, older people, less innovative people and people with less opinion leadership. In this case all the interaction terms appeared to be insignificant.

To conclude the results of the model of the replacement buying decision; only support is found for hypothesis three and five, since opinion leadership and innovativeness influences the personal rate of adoption positively. All the other hypotheses are rejected. The adoption categories are not normally distributed, age and gender have an influence on the speed of adoption, education and income are insignificant and SNI has no influence on the personal rate of adoption.

### *8.4 Mutual Relationships Between Variables*

At this point the effects of the variables on the different products are discussed. Now the variables will be checked on mutual relationships. First again a simple regression is done with personal innovativeness as dependant variable. The simple regression model revealed insignificant results for all the variables and interaction terms. Also in the multiple regression model all the results were insignificant. So, support is found for hypothesis eight (age and gender).

The second regression is done with opinion leadership as dependant variable. It appeared that only gender (0,046) and education (0,000) gave significant results. For the other variables insignificant results were found. Now a multiple regression is done, but it appeared that only education gave a significant result (0,000). This means that the effect of gender is taken over by the factor education, because this appears to be the only factor that influences opinion leadership.

To conclude the results of the model of opinion leadership; only support is found for hypothesis seven (except education), since education has a positive effect on opinion leadership. All the other hypotheses are rejected. Neither the personal characteristics, except education, personal innovativeness or SNI influences opinion leadership.

Finally, there is done a simple regression on the variable SNI. The simple regression revealed significant results for gender (0,022) and income (0,026). The results of the multiple regression are described in table 5.

**Table 4: Multiple regression function for SNI**

| | ***Unstandardized coefficient*** | ***T-Value*** | ***R*** | ***Significance*** |
|---|---|---|---|---|
| Constant | -0,021 | -0,087 | | 0,931 |
| Gender (1 = male) | 0,674 | 3,603 | 0,332 | 0,000 |
| Education | 0,390 | 2,159 | 0,188 | 0,033 |
| Income | -0,270 | -3,384 | -0,310 | 0,001 |

The dependent variable is SNI; the higher the outcome gets, the less one is susceptible to the normative influence. The independent variables are coded the other way around; the higher one scores on for instance innovativeness, the more innovative he or she is.

The final model consists out of three of the seven possible variables which are all significant at a significance level of 5%. The results in the table show that there is indeed a difference with the results of the simple regression; first only gender and income were significant, but now income is significant too. It seems to be that the influence of income is stronger in combination with other factors and that the effect of none of the variables is taken over by other variables.

The standardized b-values (R) show the effects of the different variables directly comparable to each other. So, boys, people who have a high level of education and people who have a lower income will tend to be more susceptible to the normative influence than girls, people with a lower level of education and people with a higher income. In this case all the interaction terms appeared to be insignificant.

To conclude the results of the model of SNI; only support is found for hypothesis nine (only the variable age), since the factor age is insignificant. All the other hypotheses are rejected. The personal characteristics gender, education and income do influence the level of SNI and innovativeness and opinion leadership are not related to SNI.

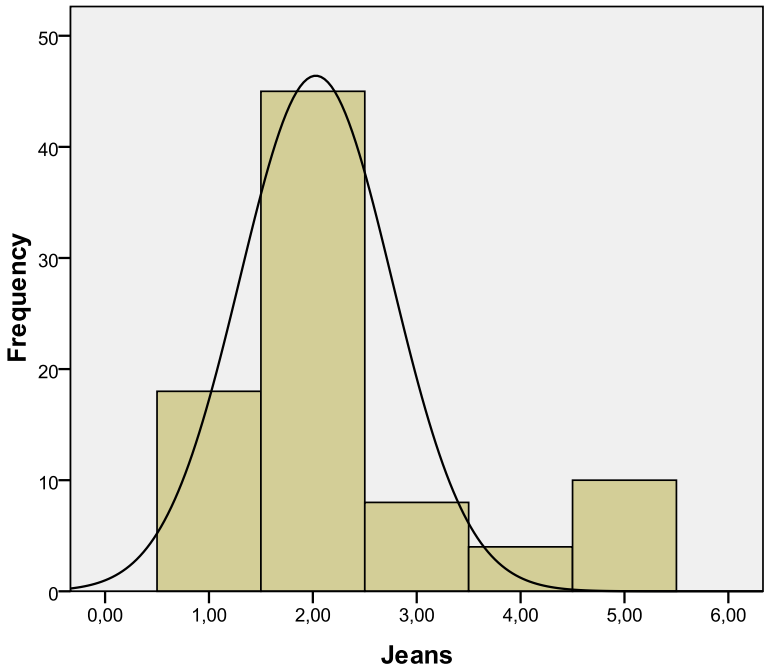
### *8.5 Relevant Market*

However it is very likely to assume that all the youngsters that have responded to my questionnaire share a need for jeans, coke and a music device, it is not proved that this actually is true. In the survey, people had the opportunity to answer that they 'never' should buy this kind of product. It is questionable that these people belong to the relevant market, so it is necessary to check if the results are comparable if these results are excluded. In the following section the first six hypotheses

will be tested another time, but this time without the undesired ('I will never buy this product') results.

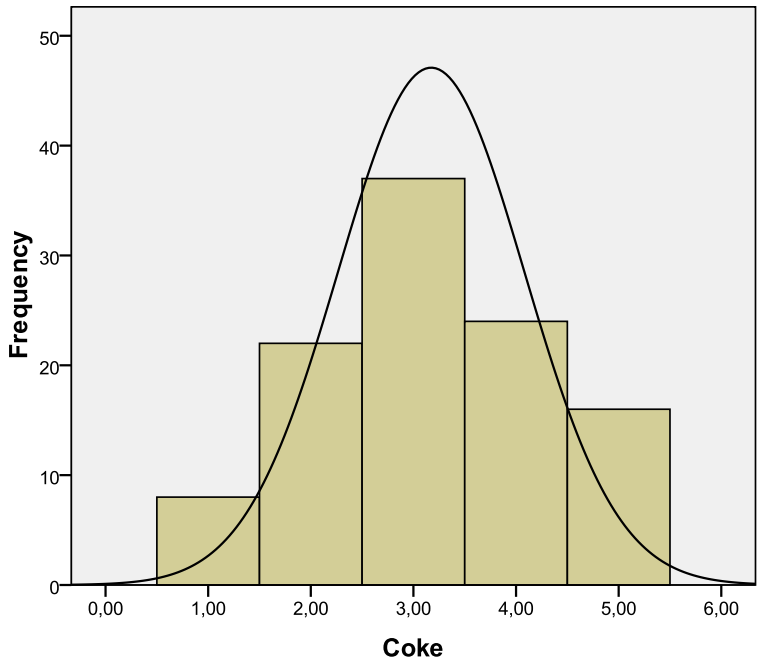
To find evidence for the first hypothesis, the three products were tested on a normal distribution again. Therefore they are pictured in a graph and is the Shapiro – Wilk test executed.

**Graph 5: Distribution of New Product Buying Decision**



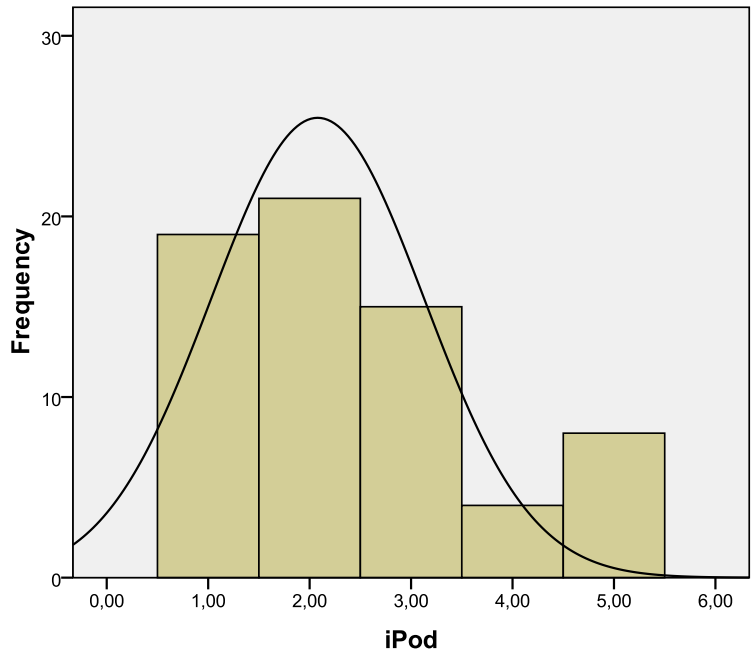

The first graph, the one of the jeans, does not look like a normal distribution at all. This is also proved by the Shapiro – Wilk test, because it gave a significance level of 0,000. However, over here it is again not possible to make conclusions about the theory of Rogers since the boundaries of the adopter categories might differ. Though, according to this data, the adopter categories differ from the ones presented by Rogers in a relevant market for a new product buying decision.

**Graph 6: Distribution of New Low Involvement Product Buying Decision**




The second graph, the one of the coke, does look like a normal distribution. Unfortunately the Shapiro – Wilk test does not confirm this. Again the test gave a significance level of 0,000, so the distribution is not normal. According to this data, the adopter categories differ from the ones presented by Rogers in a relevant market for a low involvement product buying decision.

**Graph 7: Distribution of Replacement Buying Decision**



The third graph, the one of the iPod, does not look like a normal distribution at all. This is confirmed by the Shapiro – Wilk test, because it gave a significance level of 0,000. This means that the distribution is not normal. According to this data, the adopter categories differ from the ones presented by Rogers in a relevant market for a replacement buying decision.

The first part of hypothesis two is the same as before, but the second part could be different. The answer of this part can be found with the answers of hypothesis three for the different product categories. Therefore first a regression will be done for the jeans. With this regression an answer is found for hypothesis three, four, five and six for this product.

To start, again a single regression is done. It appeared that gender (0,000), age (0,042), personal innovativeness (0,000) and opinion leadership (0,002) gave significant results. After this single regressions a multiple regression with all the variables and interaction terms between the three factors included (all except the personal characteristics) is executed. After the first regression the most insignificant factor was removed and this was repeatedly done, until all the factors were significant. The results are presented in table 5.

**Table 5: Multiple regression function for a new product buying decision**

| | ***Unstandardized coefficient*** | ***T-Value*** | ***R*** | ***Significance*** |
|---|---|---|---|---|
| Constant | -0,457 | -0,520 | | 0,604 |
| Gender (1 = male) | 1,469 | 7,972 | 0,610 | 0,000 |
| Age | 0,158 | 3,331 | 0,292 | 0,001 |
| Education | -0,481 | -2,284 | -0,192 | 0,025 |
| Income | -0,466 | -4,215 | -0,382 | 0,000 |
| Innovativeness | -0,387 | -4,809 | -0,353 | 0,000 |
| Opinion Leadership | 0,578 | 5,949 | 0,491 | 0,000 |

The dependent variable is the buying decision of the jeans; the higher the outcome gets, the slower the rate of adoption is. The independent variables are coded the other way around; the higher one scores on for instance innovativeness, the more innovative he or she is.

It is obvious that these results are different than the outcome of the single regressions. The influence of some factors appears to change in combination with other variables. The standardized b-values (R) show the effects of the different variables directly comparable to each other. So, girls, younger people, people who are highly educated, people who have a high income, people who are innovative

and people who are no opinion leader will buy these new jeans earlier than boys, older people, less educated people, people with less income, less innovative people and people with more opinion leadership. None of the interaction effects appeared to have influence.

To conclude the results of the model of the new product buying decision; support is found for hypothesis four (the variables income and education) and five, since income, education and personal innovativeness influences the personal rate of adoption positively. All the other hypotheses are rejected. Age and gender do have influence, opinion leadership has a negative effect on the personal rate of adoption SNI has no influence on the personal rate of adoption.

Out of the single regressions for the coke appeared that only income (0,005) and personal innovativeness (0,000) gave significant results. After this single regressions a multiple regression with all the variables and interaction terms between the three factors included (all except the personal characteristics) is done. After the first regression the most insignificant factor was removed and this was repeatedly done, until all the factors were significant. The results are presented in table 6.

**Table 6: Multiple regression function for a new low involvement product buying decision**

| | ***Unstandardized coefficient*** | ***T-Value*** | ***R*** | ***Significance*** |
|---|---|---|---|---|
| Constant | 1,069 | 1,039 | | 0,301 |
| Age | 0,160 | 2,892 | 0,292 | 0,005 |
| Education | -0,436 | -2,110 | -0,182 | 0,037 |
| Income | -0,414 | -4,320 | -0,418 | 0,000 |
| Innovativeness | -0,442 | -4,757 | -0,396 | 0,000 |

The dependent variable is the buying decision of the new coke; the higher the outcome gets, the slower the rate of adoption is. The independent variables are coded the other way around; the higher one scores on for instance innovativeness, the more innovative he or she is.

It is obvious that these results are different than the outcome of the single regressions. The influence of some factors appears to change in combination with other variables. The standardized b-values (R) show the effects of the different variables directly comparable to each other. So, younger people, people who are highly educated, people who have a high income and innovative people will buy this new coke earlier than older people, less educated people, people with less income and less innovative people. None of the interaction effects appeared to have influence.

To conclude the results of the model of the new low involvement product buying decision; support is found for hypothesis four (all except age) and five, since income, education and personal innovativeness influences the personal rate of adoption positively and gender does not influence it. All the other hypotheses are rejected. Age does have influence and opinion leadership and SNI have no influence on the personal rate of adoption.

Finally there are done single regressions for the iPod. It appeared that only gender (0,010) and personal innovativeness (0,006) gave significant results. After this single regressions a multiple regression with all the variables and interaction terms between the three factors included (all except the personal characteristics) is done. After the first regression the most insignificant factor was removed and this was repeatedly done, until all the factors were significant. The results are presented in table 7.

**Table 7: Multiple regression function for a replacement buying decision**

| | ***Unstandardized coefficient*** | ***T-Value*** | ***R*** | ***Significance*** |
|---|---|---|---|---|
| Constant | 2,248 | 6,483 | | 0,000 |
| Gender (1 = male) | -1,162 | -3,634 | -0,434 | 0,001 |
| Income | 0,379 | 2,835 | 0,339 | 0,006 |

The dependent variable is the replacement buying decision of the iPod; the higher the outcome gets, the slower the rate of adoption is. The independent variables are coded the other way around; the higher one scores on for instance innovativeness, the more innovative he or she is.

Again, the results of the multiple regression are different than the outcome of the single regressions. The influence of some factors appears to change in combination with other variables. The standardized b-values (R) show the effects of the different variables directly comparable to each other. So, boys and people who have a lower income buy this iPod earlier than girls and people with more income. None of the interaction effects appeared to have influence.

To conclude the results of the model of the new low involvement product buying decision; only support is found for hypothesis four (age), since income influences the personal rate of adoption negatively and age does not influence it. All the other hypotheses are rejected. Gender does have influence and education, personal innovativeness, opinion leadership and SNI have no influence on the personal rate of adoption.

### *8.6 Summary of the Results*

Now all the models are complete, so the results can be summarized into the complete answers of the hypotheses. Hypothesis one suggested that the partition of the people over the adoption categories is just like the distribution suggested by Rogers. This hypothesis is not supported by the analysis in each of the three purchase decisions. In all three categories the population was not normally distributed. So, the importance of my statement that young people differ from the rest of the population is partly proved. For this study evidence is found, but it is not certain that the answer categories completely correspond with the boundaries set by Rogers. So, it is not clear out of how many adopter categories the presented data should exist, but the percentages of the distribution in this study are not the same as the known theory. Over here the results of the three product categories are the same. The same results were found when the non-adopters were excluded.

Hypothesis two suggested that there are opinion leaders among the group of young people, but the effect of opinion leadership should differ over products. First, a histogram was made. Based on this plot, a lot of people are supposed to be an opinion leader. Whether or not the effect of these opinion leaders is different with other products is studied in hypothesis three. This hypothesis suggested that the level of opinion leadership influences the rate of personal adoption positively. In the first case, a new product buying decision, opinion leadership has a negative effect on this adoption rate. In the second case, a low involvement product buying decision, opinion leadership has a positive effect. In the last case, a replacement purchase decision, the level of opinion leadership has a positive effect too. So, the second part of hypothesis two is supported, because hypothesis three should be rejected for a new product buying decision and is supported by a new low involvement buying decision and a replacement buying decision. The results for hypothesis two and three are different when the results of the non-adopters are excluded, because in none of the cases opinion leadership appeared to have influence. This means that hypothesis three should be rejected and that the influence of opinion leadership does not differs amongst different products. Therefore the second part of hypothesis two should be rejected as well.

Hypothesis four suggests that age and gender do not influence the personal rate of adoption and that income and education increases it. In the first case only gender has a significant result, so the hypothesis should be rejected on behalf of gender, income and education. In the second case age and income have a significant result. This means that that the hypothesis should be rejected over here on behalf of age and education. In the third case gender and age had a significant result. Now the complete hypothesis should be rejected. Without the non-adopters, support for the hypothesis is

found for the factors income and education with the jeans, the factors gender, income and education with the coke and the factor age with the iPod. So, the results are very different.

Hypothesis five is about the positive relationship between the personal rate of adoption and innovativeness. Support for this hypothesis is found in all three the cases. After the non-adopters were removed support for the hypothesis is found in the first two cases too. Hypothesis six suggested a negative relationship between SNI and the adoption rate. This hypothesis should be rejected completely. In the first case a positive effect is found and in the last two cases the effect was insignificant. Without the non-adopters no relationship was found for all the three products.

The last six hypotheses are about the mutual relationships between the variables. The factor innovativeness appeared to have no significant effects, so hypotheses eleven and twelve should be rejected. However support is found for hypothesis eight, because the variables age and gender indeed had no influence. The variable opinion leadership is only influenced by education. Hypothesis seven is therefore supported; gender, age and income indeed have no effect, but it should be rejected on behalf of the positive effect of education. Hypothesis ten and twelve should be rejected, because SNI and innovativeness have no effect on opinion leadership. The last variable, SNI, is related to gender, education and income. This means that hypothesis nine should be rejected, except for the factor age. Finally, hypotheses ten and eleven should be rejected.

# 9. Conclusions

In this final conclusion I will answer the main question first and after that I will describe the limitations of this study and some possibilities for future research.

## *9.1 General Discussion*

The research question of this thesis was: *What are the determinants of the rate of diffusion of new product innovations among young people?* The question should be answered by two components. First the literature study has to reveal the answer to this question on the level of the company and after this was done, a study should attempt to answer the side of the customer.

There is done lot of research to indicate what the diffusion process contains. Therefore a broad description of the types of innovations and the findings of Rogers are given. It appeared that the function of a company on the level of new product innovations is quite low. The company has to come up with a new product and they have to form a message to let the market know what the product is. One important item is the accessibility of the product. There are a few stages in the adoption process where it is possible for companies to interfere. When they do this, they try to create a positive attitude of the consumer towards the product. Therefore, the marketing strategy is very important. With this strategy, the accessibility of the product can be widened too. But whether or not the attitude becomes positive is determined by the customer itself. The time it takes to do so is that too. The company can only change this time by reaching for the right customer, with the right message. The product has to be accessible and the customer has to be convinced that the product is worth the effort. So, if a company has clearly defined their strategy, all they can do is wait what is going to happen. I argue with the research that the theory is applicable to each relevant market. In this study the age range 15 to 25 years of age is used to confirm this. A difference of this relevant market is the use of internet and other (social) media. Young people use those media different than older people, so the influences for companies could be different. According to this assumption, the consumer determinants of the rate of adoption are tested in the age category mentioned.

There are some personal traits that cause the speed of adoption of new products. Some people are better informed about new products and others are more sensitive to marketing actions. The study that is done tried to link the personal traits age, gender, income education, personal innovativeness, opinion leadership and SNI to the personal rate of adoption. When the results on a personal level are combined, the rate of diffusion is found.

It appeared that gender (girls), personal innovativeness (positive), opinion leadership (negative), SNI (positive) and the interaction effect of innovativeness and SNI are variables that influence the personal adoption rate. It is not strange that gender is significant, while the subject of the question in the survey was about a fashion product. Though, it is not sure if this factor influences the rate of diffusion. Personal innovativeness is positive related to the dependent variable, what was expected. When a relevant market contains a lot of innovative people, the rate of diffusion will be very high. The other two variables that were significant, opinion leadership and SNI, had exactly the opposite effect as one should suspect. People with a lot of opinion leadership should have a more knowledge about products than others, so it is logical that they would adopt products very quick. The factor SNI was suspected to have no or a negative influence on the personal rate of adoption. People who are very susceptible to normative influence are very afraid of the opinion of others. Therefore, they were suspected to adopt a new product relatively late, because they have to wait before others have approved the product. Finally, the interaction effect between innovativeness and SNI is significant. This is quite a logical effect, because both the factors have a large positive effect. Therefore, they reinforce each other. The same hypotheses were tested without the non-adopters as well. These results were slightly different, because age (negative), education (positive) and income (positive) influence the personal rate of adoption now as well. However, the factor SNI was not significant anymore. This means that with the two analyses combined all the different variables influence the rate of adoption significantly. In this case the non-adopters should be part of the relevant market as well, because all the young people are supposed to wear jeans.

Since the analysis does not give a proper answer, the hypotheses are tested as well with a new low involvement product and a replacement purchase decision. In the first case age (negative), income (positive), innovativeness (positive), opinion leadership (positive), SNI (positive), the interaction term between opinion leadership and SNI (positive) and innovativeness and opinion leadership (positive) appeared to have a significant effect. This differs with the results of the new product. Here only the effect of SNI is still strange. In the second case gender (boys), age (negative), innovativeness (positive) and opinion leadership (positive) are significant. These results are again different, but here are no strange effects. The results are again different when the non-adopters are excluded. For the coke the factors age (negative), education (positive), income (positive) and innovativeness (positive) were significant. Here, again all the people form the relevant market, because all the young people are supposed to drink soft drinks (for instance coke). This is different for the iPod. Not everyone shares a need for music devices because many people valuate this differently. Therefore the results of the second analysis are very important. Gender (male) and income (negative) gave significant

results. The effect of income is very strange, because iPods are quite expensive. Therefore the expectation is that the effect should be positive.

Finally, the mutual relationships between the variables are investigated. This leads to figure 15. The big arrow indicates the interaction effect and the two enumerations indicate the mutual relationships to the factors opinion leadership and SNI.

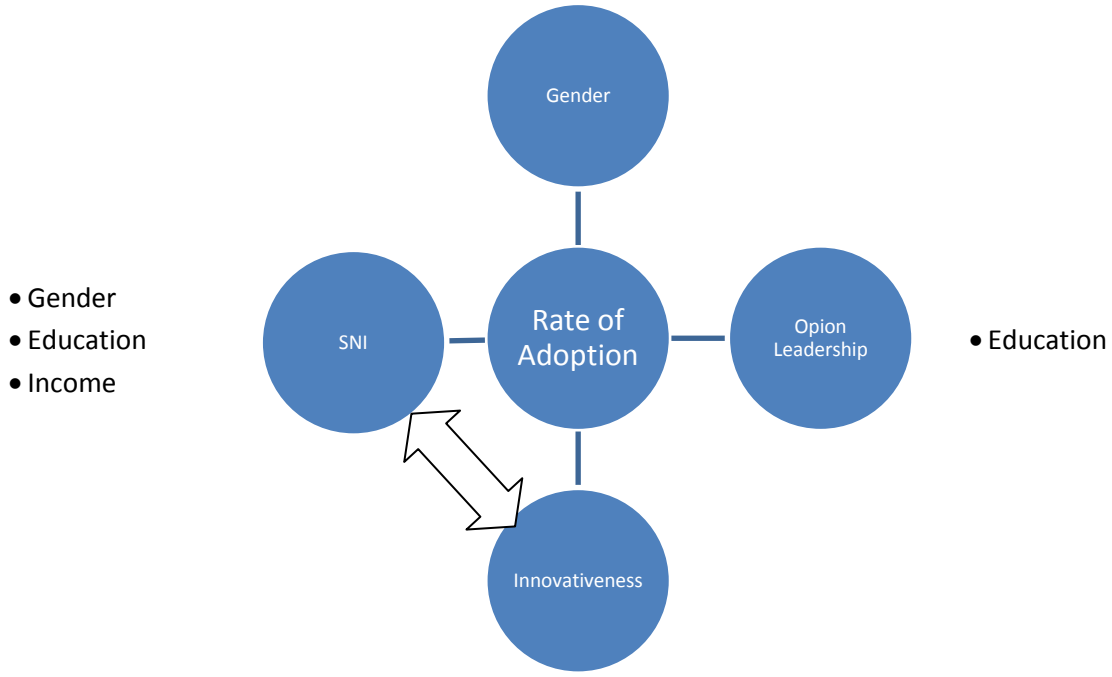



**Image 15: Influences**

With this information it is possible to give a solid answer to the main question. The product and the message (strategy) play a big part in the determination of the rate of adoption of this product. If a product is very complicated, or if people do not know why the product should be used, they will not buy it. Besides the company aspects, it appeared that many young people are opinion leaders and that this factor influences the rate of adoption of someone. SNI influences the rate of adoption too, but it appeared that it is positive if people are susceptible to normative influence. Personal innovativeness does play a big part, but a new product cannot be targeted to innovative people. The factors gender, income and education are very important (in)direct variables to the personal rate of adoption, but to the rate of diffusion too. However, these effects are expected when a product is launched in a certain relevant market. So the determinants of the rate of diffusion are the product itself, the message, the characteristics of the users in the relevant market and the innovativeness, SNI and the level of opinion leadership of the users in the relevant market. After all it appears that it

is not possible to recognize anyone as a quick adopter. The personal traits and the social system of this person determine this. So after all, the category of young people differs from the known theory, but it has no major differences.

### *9.2 Limitations and Future Research*

There are a lot of limitations of this study. For instance, only a few product categories were tested and the dataset was not very representative. To do it better, the factor education should be taken into account a lot more, because my dataset contained a lot of high educated people and only a few lower educated ones. Besides the components of the data it might be very interesting to see whether other age ranges differ as much as young people from the research that is done. The questions of the products were picked a little unfortunately. Not many people buy iPods anymore, because they just use their iPhone to play their music, maybe this caused the strange answers. Finally, a closer look is needed to the side of the firm.

# 10.References

## *10.1 Articles and Books*

Aaker, D. (2007). 'Innovation: Brand it or lose it.'
*California Management Review,* 50(1), 8 – 24.

Bandura, A. (1977). 'Self-efficacy: Toward a unifying theory of behavioral change.'
*Psychological Review,* 84(2), 191 – 215.

Batra, R., Homer, P.M. & Kahle, L.R. (2001). 'Values, susceptibility to normative influence, and attribute importance weights: A nomological analysis.'
*Journal of Consumer Psychology,* 11(2), 115 – 128.

Damanpour, F. & Gopalakrishnan, S. (2001). 'The dynamics of the adoption of product and process innovations in organizations.'
*Journal of Management Studies,* 38(1), 45 – 65.

Demoulin, N.T.M. & Zidda, P. (2009). 'Drivers of customers' adoption and adoption timing of a new loyalty card in the grocery retail market.'
*Journal of Retailing,* 85(3), 391 – 405.

Dholakia, R.R. & Uusitalo, O. (2010). 'Switching to electronic stores: consumer characteristics and the perfection of shopping benefits.'
*International Journal of Retail & Distribution Management,* 30(10), 459 – 469.

Ettlie, J.E. & Vellenga, D.B. (1979). 'The adoption time period for some transportation innovations.'
*Management Science,* 25(5), 429 – 443.

Gatignon, H. & Robertson, T.S. (1985). 'A propositional inventory for new diffusion research.'
*Journal of Consumer Research,* 11, 849 – 867.

Gielens, K. & Steenkamp, J.B.E.M. (2007). 'Drivers of consumer acceptance of new packaged goods: An investigation across products and countries.'
*International Journal of Research in Marketing,* (24), 97 – 111.

Girard, T. (2010). 'The role of demographics on the susceptibility to social influence: A pretest study.'
*Journal of Marketing Development and Competitiveness,* 5(1), 9 – 22.

Hirschman, E.C. (1980). 'Innovativeness, novelty seeking and creativity.'
*The Journal of Consumer Research,* 7(3), 283 – 295.

Hoffman, D.L., Kopalle, P.K. & Novak, T.P. (2010). 'The "right" consumers for better concepts: Identifying consumers high in emergent nature to develop new product concepts.'
*Journal of Marketing Research,* 47, 854 – 865.

Im, S., Bayus, B.L. & Mason, C.H. (2003). 'An empirical study of innate consumer innovativeness, personal characteristics, and new-product adoption behavior.'
*Journal of the Academy of Marketing Science,* 31(1), 61 – 73.

Im, S., Mason, C.H. & Houston, M.B. (2007). 'Does innate consumer innovativeness relate to new product / service adoption behavior? The intervening role of social learning via vicarious innovativeness.'
*Journal of the Academy of Marketing Science,* 35, 63 – 75.

Ittersum, K. van & Feinberg, F.M. (2010). 'Cumulative timed intent: A new predictive tool for technology adoption.'
*Journal of Marketing Research,* 47, 808 – 822.

Kapur, P.K., Singh, O., Chanda, U. & Basirzadeh, M. (2010). 'Determining adoption pattern with pricing using two-dimensional innovation diffusion model.'
*Journal of High Technology Management,* 21, 136 – 146.

Karahanna, E., Straub, D.W. & Chervany, N.L. (1999). 'Information technology adoption across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs.'
*MIS Quarterly,* 23(2), 183 – 213.

Katona, Z., Zubcsek, P.P. & Sarvary, M. (2011). 'Network effects and personal influences: The diffusion of an online social network.'
*Journal of Marketing Research,* 48, 425 – 443.

Kriechel, B. & Ziesemer, T. (2009). 'The environmental Porter hypothesis: Theory, evidence, and a model of timing adoption.'
*Economics of Innovation and New Technology,* 18(3), 267 – 294.

Lenk, P.J. & Rao, A.G. (1990). 'New models from old: Forecasting product adoption by hierarchical Bayes procedures.'
*Marketing Science,* 9(1), 42 – 53.

Mahajan, V., Muller, E. & Srivastava, R.K. (1990). 'Determination of adopter categories by using innovation diffusion models.'
*Journal of Marketing Research,* 27, 37 – 50.

Mangleburg, T.F., Doney, P.M. & Bristol, T. (2004). 'Shopping with friends and teens' susceptibility to peer influence.'
*Journal of Retailing,* 80, 101 – 116.

Meyer, A.D. & Goes, J.B. (1988). 'Organizational assimilation of innovations: A multilevel contextual analysis.'
*The Academy of Management Journal,* 31(4), 897 – 923.

Midgely, D.F. & Dowling, G.R. (1978). 'Innovativeness: The concept and its measurement.'
*Journal of Consumer Research,* 4, 229 – 242.

Mittal, B. (1994). 'An integrated framework for relating diverse consumer characteristics to supermarket coupon redemption.'
*Journal of Marketing Research,* 31(4), 533 – 544.

Moore, G.A. (2005). *Dealing with Darwin.*
New York: The Penguin Group.

Musso, C. (2009). 'New learning form old plastics: The effects of value-chain-complexity on adoption time.'
*Technovation,* 29, 299 – 312.

Pallister, J.G. & Foxall, G.R. (1998). 'Psychometric properties of the Hurt – Joseph – Cook scales for the measurement of innovativeness.'
*Technovation,* 18(11), 663 – 675.

Rogers, E. M. & Shoemaker, F. F. (1971). *Communication of innovations.*
New York: The Free Press.

Rogers, E.M. (1976). 'New product adoption and diffusion.'
*Journal of Consumer Research,* 2, 290 – 301.

Rogers, E.M. (1995). *Diffusion of innovations.*
New York, The Free Press.

Ryan, B. and Gross, N.C. (1943). 'The diffusion of hybrid seed com in two Iowa communities.'
*Rural Sociology,* 8, 15-24.

Sarker, S. & Valacich, J.S. (2010). 'An alternative to methodological individualism: A non-reductionist approach to studying technology adoption by groups.'
*MIS Quarterly,* 34(4), 779 – 808.

Scarso, E. (1996). 'Timing the adoption of a new technology: an option-based approach.'
*Management Decision,* 34(3), 41 – 48.

Sriram, S., Chintagunta, P.K. & Agarwal, M.K. (2010). 'Investigating consumer purchase behavior in related technology product categories.'
*Marketing Science,* 29(2), 291 – 314.

Steenkamp, J.B.E.M. & Gielens, K. (2003). 'Consumer and market drivers of the trial probability of new consumer packaged goods.'
*Journal of Consumer Research,* 30 (3), 368 – 384.

Steenkamp, J.B.E.M., Hofstede, F. ter & Wedel, F. (1999). 'A cross-national investigation into the individual and national cultural antecedents of consumer innovativeness.'
*The Journal of Marketing,* 63(2), 55 – 69.

Sundqvist, S., Frank, L. & Puumalainen, K. (2005). 'The effects of country characteristics, cultural similarity and adoption timing on the diffusion of wireless communications.'
*Journal of Business Research,* 58, 107 – 110.

Tarde, G. (1903). *The Laws of Imitation.*
New York: Holt, 1903.

Tornatzky, L.G. & Klein, K.J. (1982). 'Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings.'
*IEEE Transactions on Engineering Management,* 29(1), 28 – 43.

Unsworth, K.L., Sawang, S., Murray, J. & Sorbello, T. (2009). *'Developing an integrative model for understanding innovation adoption.'* Unpublished manuscript.
The Academy of Management 2009 Annual Meeting Proceedings: Green Management Matters.

Valente, T.W. & Davis, R.L. (1999). 'Accelerating the diffusion of innovations using opinion leaders.' *The Annals of the American Academy,* 566*,* 55 – 67.

Vannoy, S.A. & Palvia, P. (2010). 'The social influence model of technology adoption.' *Communications of the ACM,* 53(6), 149 – 153.

Wiedmann, K.P., Walsh, G. & Mitchell, V.W. (2001). 'The mannmaven: an agent for diffusing market information.'
*Journal of Market Communications,* 7, 195 – 212.

### *10.2 Websites*

Applegate, S. 'As a professional, how do you rate yourself as an adopter of change?'
http://steveapplegate.com/consultant/adopter/index.htm (15-5-2011)

Intemarketing. 'Segmenteren (marketing), segmenteren van de markt.'
http://www.intemarketing.nl/marketing-algemeen/segmenteren (20-5-2011)

NetMBA.com. 'Market Segmentation.'
http://www.netmba.com/marketing/market/segmentation/ (20-5-2011)

University of Southern California. 'Segmentation, targeting and positioning.'
http://www.consumerpsychologist.com/cb_Segmentation.html (20-5-2011)

### *10.3 Images*

1. Moore, G.A. 'Dealing with Darwin', page 61
2. Moore, G.A. 'Dealing with Darwin', page 62
3. http://www.samcarrara.com/marketing/marketing/wp-content/uploads/product-life-cycle.gif
4. http://johnmill.files.wordpress.com/2010/02/s-shapedcurve.jpg?w=516&h=315
5. http://rickwilsondmd.typepad.com/.a/6a01156e42deab970c01310fd60434970c-800wi
6. http://www.africa2edu.net/web_images/final_project_b_html_7847565b.png
7. http://www.utwente.nl/cw/theorieenoverzicht/Levels%20of%20theories/macro/Diffusion%20of%20Innovation%20Theory.doc/Diffusion%20of%20Innovation%20Theory-1.png
8. http://www.consumerpsychologist.com/images/cb/STP.png
9. http://www.morpace.com/images/segmentation-graphic.jpg
10. http://www.email-marketing-wizard.com/wp-content/uploads/2010/03/Segmentation-UA.jpg

# 11. Appendix

This is the questions of the survey:

1) What is your gender?
   a. Male
   b. Female

2) What is your age?
   …… years

3) What is the highest level of education you followed? (Dutch system)
   a. Basisschool
   b. MAVO/VMBO
   c. HAVO
   d. VWO
   e. MBO
   f. HBO
   g. WO
   h. Other

4) What is your average monthly income?
   a. 250 euro or less
   b. Between 250 euro and 500 euro
   c. Between 500 euro and 1000 euro
   d. Between 1000 euro and 1500 euro
   e. Over 1500 euro

After these personal questions the following propositions were asked in a random order. Items were scored on a five-point scale ranging from completely agree to completely disagree. An asterisk (*) indicates reverse scored item.

*Personal innovativeness*

When I see a new product on the shelf, I'm reluctant to give it a try. (*)

In general, I am among the first to buy new products when they appear on the market.

If I like a brand, I rarely switch from it just to try something new. (*)

I am very cautious in trying new and different products. (*)

I am usually among the first to try new brands.

I rarely buy brands about which I am uncertain how they will perform. (*)

I enjoy taking chances in buying new products.

I do not like to buy a new product before other people do. (*)

*Opinion Leadership*

I like introducing new brands and products to my friends.

I don't talk to friends about the products that I buy. (*)

My friends and neighbors often come to me for advice.

People seldom ask me for my opinion about new products. (*)

*Uncertainty*

If I want to be like someone, I often try to buy the same brands that they buy.

It is important that others like the products and brands I buy.

I rarely purchase the latest fashion styles until I am sure my friends approve of them.

I often identify with other people by purchasing the same products and brands they purchase.

When buying products, I generally purchase those brands that I think others will approve of.

I like to know what brands and products make good impressions on others.

If other people can see me using a product, I often purchase the brand they expect me to buy.

I achieve a sense of belonging by purchasing the same products and brands that others purchase.

Finally another three questions were asked:

You've seen a commercial on the television about a new type of Pepsi of which you think you would really like it. When are you going to try this new flavor?

a. Immediately
b. After a few days
c. After two weeks
d. After a month
e. More than a month
f. Never

You've heard that next week a new type of jeans is available. According to the images you've already seen, you really like this new model. How long will it take before you buy these new jeans?

a. Immediately
b. After a month
c. After two months
d. After three months
e. More than three months
f. Never

Apple introduces a new type of iPod next week, while your old one just broke down. When are you going to buy this new one?

a. Immediately
b. After a month
c. After two months
d. After four months
e. After a half year
f. Never