Factors influencing decision making in asymmetric information settings: a classroom experiment.

Pepijn Meddens
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Pepijn Meddens
Registration number: 851101-549-090
Supervisor: Prof. dr. G. Antonides
Second supervisor: dr. ir. G.J. Hofstede
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Abstract

Economics courses at high schools in the Netherlands are changing towards a more experiment driven education system. In this research a classroom game was constructed which introduces students to the economic concept of asymmetric information. During the classroom game a two-person negotiation about a used car will take place.

Results from the classroom game are used by this research to investigate factors influencing decision making of young people. First the influence of an information setting is proven on the amount of transactions during the game. There were more transactions in symmetric information settings than in asymmetric information settings.

No effect was measured on the factor ambiguity, which measured the difference between risk and uncertainty towards a decision. People did not buy more cars or paid a different price in either situation so no effect was measured of ambiguity in asymmetric information settings.

Only trustworthiness was influencing decision making out of the three perceptions measured by this research. Risk aversion and ethical behavior did not influence the amount of transactions during the game.

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1. Introduction

This Chapter will give an introduction about the research. It will handle the background of the problem, followed by the research goals and research questions. In Section 1.2 the relevance of this research will be discussed and in Section 1.3 a short overview is given.

1.1 Background of the problem

During the whole day people make decisions. Within these decision making processes information plays a vital role. People can either have the same amount of information for a product or one person has more information than another. This information asymmetry creates an information gap between multiple persons and creates an opportunity in decision making to take advantage of this information gap (Kulkarni 2000).

Studies on the role of information in the economics are a relative young research field. Until the late twentieth century this subject was not much studied (Stiglitz 2000). In 2001 the Nobel prize was granted to the work of Akerlof, Spence and Stiglitz on the field of markets with asymmetric information. They proved that information and economics are related within different settings.

An opportunity to investigate information asymmetry arose when classroom experiments were introduced at high schools. Economics courses at high schools in the Netherlands changed in study year 2011-2012. Asymmetric information will be a new topic handled in economics courses (Teulings 2005). These topics will be taught in a different way than lectures. Experiments about economic topics should help students understand new theories and subjects within economic courses. New experiment should be created for high schools to make them understand asymmetric information. During this experiment student behavior can be analyzed for scientific research.

There are several factors influencing decision making in asymmetric information settings. This research investigates several factors, beginning with the relation between uncertainty and risk. As far as we know no research has been conducted on the role of ambiguity in asymmetric information settings, while risk is a large part of study in asymmetric information settings. In this research the role of ambiguity will be tested in decision making processes in asymmetric information.

Another factor studied is the role of bought information. Rational knowledge will lead people to look for information when there is no or not enough information available. To help students make better decisions in asymmetric information settings they will be offered a possibility to buy information. An incentive is created to see if people are recognizing asymmetric information and have the ability to buy information to overcome this asymmetric setting.

Several studies showed factors risk aversion, ethical behavior and trustworthiness influencing decision making in asymmetric information settings. This research wants to know if young people also make similar decisions.

Research Goal

This research has two different goals: practical with creating a classroom game and scientifically by analyzing the results of the classroom game.

The first practical research goal is to:

Create a classroom game optimized for economics courses at high schools in the Netherlands which shows the difference between symmetric and asymmetric information.

The second research goal is about the results of the classroom game:

Identifying factors which influence young people's decision making between an asymmetric information market and a symmetric information market.

Research question

The main research question will be about the second research goal:

How do young people cope with asymmetric information?

Sub Questions

To support the research question, several sub questions are formulated.

- Is there a difference between risk and uncertainty towards product quality in asymmetric information settings?
- Does Trustworthiness, risk aversion and ethical behavior influence decision making in asymmetric information settings?
- Does the option to buy information influence decision making in asymmetric information settings?
- Is the classroom game introducing students to asymmetric information?

1.2 Relevance

High schools are looking for experiments and classroom games to help students learn economic theories. By providing a classroom game which can be played by students this research helps high schools with offering them a ready to use classroom game. During the classroom game students will be introduced to asymmetric information.

The classroom game will lead to insights about factors influencing decision making in asymmetric information settings. These insights can be used by all industries and all people who cope with asymmetric information settings. Results will show how to make use, or how to avoid an information gap.

1.3 Research overview

This thesis discusses two topics. The first topic is a new classroom game which is created and discussed in the thesis; the second topic will be about the research conducted during this classroom game. The first part, Chapter 2, will discuss the theory used in this research to investigate during the classroom game. In Chapter 3 the guidelines of the government and learning goals for the classroom games are discussed. Chapter 4 explains the classroom which is made for this thesis and will show how the theory used in Chapter 2 is measured during the game. Chapter 5 will give the results of the analysis and Chapter 6 will give conclusions and discussion. Below is a more detailed structure of the thesis discussed.

Chapter 2
This Chapter will give an introduction to the role of information in economics. Several information settings will be discussed and the difference between symmetric information and asymmetric information is explained. The difference between those two information settings is the basis for this research. The different information settings lead to factors which influence decision making under these conditions. The roles of ambiguity, information buying and three perceptions are discussed this Chapter.

Chapter 3
In this Chapter the economics courses at high schools in the Netherlands will be analysed. Several guidelines and restriction are used to guide the classroom game into a direction which makes it suiTable to play during economics courses. At the end of the Chapter learning goals of the game are created which should be met by the game.

Chapter 4
The guidelines in Chapter 3 will result in a classroom game. This Chapter will discuss several games in the past and will discuss the new game created for this research. Next to the explanation of the classroom game the methodology to measure the factors discussed in Chapter 2 will be discussed.

Chapter 5
This Chapter will analyse the hypotheses given in Chapter 2. First a summary of the data is discussed together with the reduction of the data in this research. In the other part of this Chapter the outputs are shown and each hypothesis is tested.

Chapter 6
A final conclusion is given in this Chapter. The outcomes of the statistical analysis are compared with the theoretical findings and conclusions are drawn from this.

2. Theory

Economics is a widely studied research field and many disciplines can be found within economics. This research is focused on asymmetric information settings in economics. This Chapter will start with a discussion about the positioning of the thesis. Figure 1 gives an overview of this Chapter and shows where the topic of asymmetric information is positioned within the literature of economics. Economics can be seen as the main theme and every small box is a sub field of study, resulting in Section 2.4 where the position of asymmetric information is described.
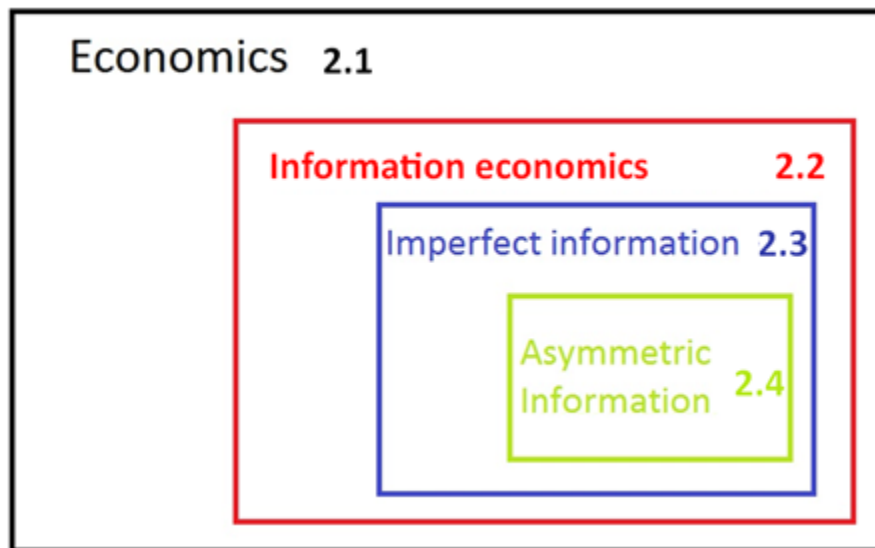
Figure 1. Positioning of asymmetric information within economics.

After the positioning of the research in Section 2.4 different quality conditions within asymmetric information settings are described in Sections 2.5. Section 2.6 discusses the influence of uncertainty and risk on asymmetric information. As asymmetric information settings are influenced by perceptions Section 2.8 will focus on perceptions influencing decision making in asymmetric information settings. Section 2.9 shows the research model studied by this research together with the hypotheses generated in the previous Sections.

2.1 The role of information in economic theory

Within the theory of economics the role of information has changed over time. This Section, as shown in Figure 1, will discuss economics in general and later will focus on the relation between economics and information. Traditional economics did not see information as a commodity. Especially in the neo-classical model supply and demand was the central focus and rational choices assumed to be made by reasoning. This Section will discuss several interpretations of information within economics.

Neo-classical approach
The traditional economic view is based on the supply and demand in a perfect world described by Adam Smith. In this perfect world all decisions are made rationally and a general equilibrium guides decisions of the market. Traditional economics approach assumes several features when making calculations.

Table 1. Features of traditional economic view

Efficient markets	Goods and services that people want are produced at the least possible cost. The producer is maximizing profits and the consumer is looking to maximize its utility (Case et al, 1999).
Production	The production will last as long as there is a gain for society. A change will lead to a higher utility function for all parties where the values of the gains exceed the value of the losses. Production will stop when the losses are bigger than the gains. (Case et al, 1999).
General equilibrium	The markets in an economy are all in simultaneous equilibrium. If an event occurs in an equilibrium which disturbs the equilibrium it could disturb other markets as well, as all markets interact with each other (Riley, 2001)(Case et al, 1999).
Perfect competition	The competition in the neo-classical approach is perfect. Participants are represented by large numbers of buyers and seller, where there are no entry or exit barriers and sellers pay the same price for inputs. All products are homogenous. The perfect competition leads to an even distribution over all consumers (Case et al, 1999)(Frank, 2006).
Rational intelligence	All decisions are made rational with the focus on maximizing the utility function.
Information	Everybody has the same information and pays the same price to access this information. The information is perfect and complete. A stakeholder does not need to know anything more about the other stakeholder as all information about other stakeholders is available (Riley, 2001).

Table 1 shows the role of information in the neo-classical approach. It is clear that information doesn't play an important role which in the model is seen as perfect. Information is always available and equally distributed among the stakeholders in the economy. The next Section will discuss the role of consumers in neo-classical economics and how consumers handle information in traditional economics.

Rational consumer choice

The behavior of consumers in the neo-classical economics is described in the rational consumer choice theory. The rational consumer choice theory is based on the neo-classical economics theory. The focus is on rational decision making of the consumer. It presumes a consumer can make rational choices where the consumer maximizes his utility. Table 2 shows several conditions which are needed to calculate the gains for consumers.

Table 2. Rational consumer choice theory conditions

Fixed prices	Prices of products are fixed and not negotiable.
Fixed income	The income of the consumer is fixed and known by everyone. The fixed prices and the fixed income together define the consumer budget constraint. Within this constraint the consumer can buy goods. It is assumed the consumer spends his entire income. (Frank, 2006)
Rational choice	The consumer is an intelligent and rational person whose preference depends on the ranking of goods. The consumer ranks goods by their value and chooses a combination of goods with the highest values. The consumer is assumed to think; more is always better.
Perfect information	Rational consumer choice theory assumes perfect information is available. The consumer has access to information to make a rational decision about the value of the goods (Frank, 2006). With all information available a rational decision can be made by the consumer.

Rational consumer choice theory is in line with the neo-classical economics that information must be perfect and distributed equally to make rational decisions as a consumer. The role of information is not important as information is assumed to be perfect and available to everybody.

Information as a commodity

Within traditional economics, like the neo-classical approach and rational consumer choice theory, information is perfect and available for all stakeholders. Every stakeholder has the same information and does not need to have additional information about the other stakeholder. Both theories suggest a situation where no perfect information exists would be not much different from a situation where perfect information exists, if the degree of information difference is not too large (Stiglitz, 2000).

The role of information in economics changed when the role of information was recognized as a commodity. Information seen as a different commodity was the starting point of a new stream of economics (Riley, 2001). The economics of information (information economics), expands the consumer choice model with information.

What is information?

Information is defined in different ways. Rowley (1998) gives five different definitions of information; Information as subjective knowledge, information as useful data or as a thing, information as a resource, information as a constitutive force in society and information as a commodity. Within information economics, information is seen as a commodity. Commodities are attainable, useable and can be managed like other factors of production Rowley (1998).

There are differences between information as a commodity and traditional tangible resources. Eaton and Bawden (1991) gives a similar definition of traditional tangible resources as Rowley (1998) did for a commodity. Eaton and Bawden (1991) identified three main differences between information commodities and traditional tangible resources shown in Table 3.

Stiglitz (2000) gives another difference between information commodities and traditional tangible resources. The difference is partly described in the consumption of information by Eaton and Bawden (1991), but is more focused on the exclusion of information during consumption. This can be found in Table 3, number 4; exclusion of information.

Table 3. Tangible goods and commodities

1. The value of information	It is not possible to quantify the value of information for all purposes. The value depends on the content and use of the information. In different settings, different values can be given to certain information.
2. Consumption of information	Information is seen as a non-rivalrous good. Information can be simultaneously consumed by multiple consumers without preventing consumption of other consumers. Information is not lost when it is given to others and remains the same load. An example of non-rivalrous information is information on public places on the internet which can be read by multiple consumers at the same time without preventing or changing the information to others. Multiple consumers can read the information simultaneously.
3. Dynamics of information	Information is a dynamic force for change in the systems. It should be viewed within an organisation as a formative organisational entity, rather than as an accumulated stockpile of facts.
4. Exclusion of information	It is possible to exclude some pieces of information to other people. Other people will not enjoy the benefits from it as the information is not available for them. If information is not available for all stakeholders it is defined as excludable. However, if it is open to everyone, information is defined as non-excludable. It is difficult to exclude individuals from enjoying the benefits of information as more and more information is accessible for everyone (Stiglitz, 2000).

Figure 2 shows a matrix of traditional tangible products can be found where traditional products are used as samples to show the type of products in each category. A distinction is made between Rivalrous and Non-rivalrous and excludable and non-excludable goods. Figure 2 is adjusted so information as a commodity can be added to the Figure.

Information can be placed in both excludable and non-excludable areas. It is possible to exclude people from accessing information, as well as not to exclude anybody and let the information be public. An example can be found in a public internet website with information readable for everyone and a closed internet website where you need to log-in to read the information.

The other variable is rivalrous or non-rivalrous. Rival goods are goods were consumption one consumer prevents consumption of a different consumer at the same moment. Non-rivalrous goods give consumers the possibility to simultaneously consume the good. The research of Eaton and Bawden (1991) placed information as a non-rivalrous good, this is why this research placed information in the Section of non-rivalrous. In Figure 2 information can be found in two blocks of the matrix.

	Excludable	Non-excludable
Rivalrous	**Private goods** food, clothing, cars, personal electronics	**Common goods (Common-pool resources)** fish stocks, timber, coal, national health service
Non-rivalrous	**Club goods** cinemas, private parks, satellite television **Information**	**Public goods** free-to-air television, air, national defense

Figure 2. Product and information differences (Weimer and Vining, 2004), adjusted to include information.

The acceptance of information as a commodity leads to the information economics which studies the relation between information and economics. This research combines the definitions given in this Section and defines information as:

"Information is a commodity which is non-rivalrous, both excludable and non-excludable, attainable, useable and can be managed like other factors of production. In different settings, different values can be given to certain information."

2.2 Information economics

Previous Section showed a transition from the traditional economics view of information to the information view which is used by information economics. Information economics or economics of information is a new stream of economics developed on contributions in economics in early 1970s (Brichler and Butler, 2007). The first contributions which showed the importance of information were fundamental for the new economic stream. This Section gives a short overview of information economics.

Information economics focuses on the role of information in economics and the use of information by stakeholders. Central questions in information economics are; how do people decide what information is complete or incomplete, how do people acquire new information, how do people learn and how do people solve problems when information is not available for every stakeholder at the same moment? Information economics investigates how economy adapts to new information and how this information is selected, absorbed and used by stakeholders in the economy (Brichler and Butler, 2007). A detailed summary of the development of information economics can be found in Stiglitz (2000) where he describes the history of information economics.

The Bank of Sweden, which awards the Nobel prize for economics in memory of Alfred Novel, awarded George Akerlof (University of California, Berkeley), Michael Spence (Stanford University) and Joseph Stiglitz (Columbia University) in 2001 for their contributions to the Economics of Information. They are seen as the fathers of information economics (Nobel prize, 2001).

The Nobel prize winners are mainly responsible for three contributions in information economics. These three contributions are still seen as the fundamentals of information economics.

1. Information is not just a commodity like many others. This is the reason why information economics questions standard paradigms of economics. If information is not widely available and distributed equally over an economy or in a decision making process, paradigms do no longer hold.

2. Information economics is always looking to explain puzzles and designs. A starting point to explain situations are the complex designs where stakeholders have more information or are better informed than other parties is. Not all situations are similar, and every situation requires an own approach.

3. Relevant economic settings are changed. As the applications of information economics can be used in many situations, it is important to study different settings. For example in technology transfer agreements and ecommerce auctions.

This research is interested in the part of information economics where information plays a vital role for decision making and where stakeholders have different information available. Different information settings can occur in decision making and will be discussed in Section 2.3.

2.3 Information settings

Information economics describes several information settings. The settings are related to the access and completeness of the information. Different settings can be used in different situations, resulting in different outcomes. The four most used settings are: complete information, perfect information, certain information and imperfect information. This Section looks at the differences among the settings. In Figure 1 (p.10) can be seen this Section is a sub part of the information economics.

Complete information

A setting where all information is available is called a complete information setting. All agents in the complete information setting are aware of the possibilities and information in a situation. The information is complete and every player is aware of the strategies and payoffs that other agents can make. In this information setting a player can make rational decisions as all information is known (Gibbons, 1992). This setting is used by classical economics to calculate rational outcomes (Stiglitz, 2002).

Perfect information

In the complete information setting all information is available. The perfect information setting differs from the complete information setting on one vital element. In a perfect information setting the behavior of the other agent is shown, while in the complete information setting the behavior and choices of the other agents are hidden. The movements and choices of the other agents are open and accessible for all agents. An example of a perfect information setting is the game of Chess, where every player can see the actions of the other player and all information is available (Thomas, 2003).

Certain information

When complete information is available, but the actions of other agents are not known, but can be guessed there is a certain information setting. In this setting the agent knows what another agent can choose, but there are more strategies which the other agent can choose. In this setting the information is complete but certain amount of information is not known to one party (Gibbons, 1992).

Imperfect information

Within decision making the information is often imperfect. Stakeholders do not have enough information to make a rational decision as not all information is available. This results in an imperfect information setting. To illustrate imperfect information settings a couple of examples are given; "candidates for a new job have knowledge about their skills, the employee doesn't have this information and has imperfect information about the candidate. A firm who wants to sell its company to a potential investor knows more about the risks and value of the firm than the investor who has imperfect information" (Stiglitz, 2002, p.470).

The examples show a situation where one agent doesn't have all information to make a rational decision. One agent has complete information, while the other agent has imperfect information. If only one agent has imperfect information and the other agent has complete information there is an

asymmetric information setting (Afzal, Roland and Al-Squri, 2009). This research will use the imperfect information setting and will describe the availability of imperfect information in Section 2.4.

2.4 Information availability

The availability of information is a new dimension which is given next to the information settings described in previous paragraphs. Two main differences between information distribution are discussed in literature, these differences are symmetric information and asymmetric information (Stiglitz, 2000)(Riley, 2001).

Symmetric information

In symmetric information markets all relevant information is known to all parties involved (Afzal, Roland and Al-Squri, 2009). All parties have the same access to information and agents can make rational choices based on the information given. This distribution of information is used in the neo-classical economics where perfect information is available.

Asymmetric information

Asymmetric information is a condition where different stakeholders in a transaction have different access and knowledge of information. One side of the market has better information than the other (Afzal, Roland and Al-Squri, 2009). The different access and knowledge of information can give a competitive advantage to one of the stakeholders in the decision making process while giving a disadvantage for the other party (Kulkarni 2000). Evidence of asymmetric information influencing the decision making process of people can be found in the used car market (Akerlof, 1970), second hand aircraft market (Gilligan, 2004) and comic book market (Dewally and Ederington, 2006).

Asymmetric information creates an advantage or disadvantage for one side of the market. Three fundamental theories explain the asymmetric information; they form the basics of the research on asymmetric information. These theories are: Signaling, Screening and adverse selection.

Signaling

Signaling is introduced by Spence (1973) as a way to explain education acts as a signal to future employers. A potential employee who is applying for a job has more information about himself than the employer. By showing an education degree, information is signaled from one agent to another. This information was previously unknown to one of the agents (employer). By showing a signal the potential employee increases his chance to be hired.

Using signaling an economic agent shows an observable signal in order to convince the other agent of the value or quality of their product or service. By showing a signal the information becomes available for both agents (Connelly, Certo and Ireland, 2010). A signal can be described as: "Some activity, or some decision, that proves that the agent concerned has a certain ability or characteristic, or possesses certain information, or in other words that the agent concerned belongs to a certain subset of the entire population. In order for the signal to be informative, only the agents that really are of the

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implied population group should be interested in carrying out the signaling activity (those that can really earn something by revealing their type) "(Macho-Stadler, 1997).

By making use of signaling an agent can add value to his product or services. Examples can be found in the new product development, patent market (Riley, 2001) and IPO of companies (Allen and Faulhaber, 1989).

Screening

If an agent has less information than the other person in a market with asymmetric information, what can this agent do to improve the outcome of the setting? This question is central in screening investigated by Rothschild and Stiglitz (1976). They investigated the insurance market where the insurance company has less information about the other agent (person to be insured). They offer multiple insurance options to screen people on their health risk and let them insure only what they need (Nobel prize, 2001).

The screening is focused on the attempt of an agent to rectify the asymmetric information setting by learning or doing research about the other agent with more information (Riley, 2001). Examples of screening can be found in job interviews (Layard, 1974) and banks who lend money (Riley, 2001)

Adverse selection

Akerlof's (1970) research on the used-car market was the fundamental research on adverse selection. Adverse selection occurs when buyers or sellers would be better off trading with someone random from the population instead of a volunteer to trade. The research of Akerlof (1970) proved that used cars that come onto the market are not a random selection from the population. The used cars on the market which are for sale are usually the worst ones. When this happens, a used-car buyer who thinks that the used cars that are for sale are of average quality is sadly mistaken. Adverse selection gives the agents a lead with private information.

Adverse selection is focused on quality of the good or service. A distinction between high and low quality can be made. When quality is not observable at the time of a transaction it is assumed for sellers of a high quality good to have little incentive to make a deal which values the price of average quality goods which are traded. High quality sellers will leave the market as the value for the high quality is not given for the product. Only the bad quality sellers remain in the market as the average price is higher than the value of their bad quality product. The prices of the market will go down just like the average quality of the traded goods. Only the worst goods will be traded in the end, these are called lemons (Ghose 2009).

2.5 Quality uncertainty

In asymmetric information markets information can be a competitive advantage. Especially when information leads to more knowledge about the quality of a product or service. The quality of a good or service can lead to an objective measurement of research. When quality uncertainty exists one agent is

not able to see the quality of the product. This creates an uncertainty towards the product due to the unknown quality (Emons and Sheldom, 2002). The research of Izquerdo (2007) includes four assumption for quality uncertainty :

- Before the transaction takes place, reliable quality indicators are only visible to only one of the potential trading partners. The other trading partner has no access to this quality indicator.

- When products with high and low quality are sold at the same price, the production and selling of low-quality products are more profiTable than producing and selling high quality products.

- The trading partner who has the knowledge of its quality advantage will present low-quality products as high-quality products.

- The product quality which is expected by the buying partner is the average market quality.

Different studies show evidence of the impact of quality uncertainty in the market. Examples can be found in the Internet selling of used cars (Fabel and Lehmann 2000) and trading slaves in pre-civil war (Greenwald and Glasspiegel, 1983).

Negotiations in asymmetric information setting with quality uncertainty will be more difficult than negotiations in symmetric information setting. In symmetric information settings, the quality is known to both parties, while in asymmetric information markets there is uncertainty on one side of the market towards the quality of the product. This uncertainty will result in a difficult position for that side of the market that passes less information. In symmetric markets more transactions will take place than in asymmetric information markets due to this uncertainty and disadvantage in negotiations. This results in the first hypothesis.

H1a: There will be more transactions in a symmetric market than in an asymmetric market

The uncertainty towards the quality of a product will result in a bigger information gap. In symmetric information settings the quality of the product is known, while in asymmetric information settings the quality is unknown. The side with more information will take advantage of this information gap and will result in a higher price per transaction. This results in a hypotheses about the price per transaction which will be lower in symmetric information settings.

H1b: A lower price will be paid per transaction in a symmetric market than in an asymmetric market

2.6 Quality uncertainty versus risk - uncertainty

Asymmetric information settings with quality uncertainty lead to a situation where the quality of a product is not known by one agent or one side of the market. This Section examines the uncertainty towards quality First the Section will introduce a definition of uncertainty and later it will discuss the difference between risk and uncertainty. The followed hypothesis will concern ambiguity aversion at the end of this Section.

Knight (1921) gave the first distinction between risk and uncertainty. Risk is seen as an objective where the probabilities are known, while uncertainty is seen as an objective where the probabilities are not known. Later this difference was redefined and Epstein (1999) gave a definition which is used in recent researches.

"Risk refers to situations where the perceived likelihoods of events of interest can be represented by probabilities, whereas uncertainty refers to situations where the information available to the decision-maker is too imprecise to be summarized by a probability measure" (Epstein 1999 p.579).

In his experiment Ellsberg (1961) measured the preference between an uncertain situation with unknown risk and a situation where the risk was known. The experiment contained two settings. The first setting was a bet whether you pick a red or blue ball in an urn with 50 red and 50 black balls. The second setting was a bet whether you pick a red or blue ball in an urn with 100 balls in total where the numbers of red balls and blue balls are unknown. The first setting showed a risk situation where the chance to pick a red ball or black ball was equal. The second setting showed an uncertain situation where no probability of picking a red ball or black ball was known. The Ellsberg experiment proved that people have an attitude of preference for known risks over unknown risks as more people went for the first setting with known risk. This phenomenon is described as ambiguity aversion.

The knowledge about the probabilities of an objective influences the decision making of people (Tversky and Fox 1995). Uncertainty is less chosen than risk if both options are available. Research shows asymmetric information settings in the financial world where ambiguity aversion exists. Research of Guidolin and Rinaldi (2010) showed a preference of agents to trade in less uncertain assets where the risks are more known, while the risk could be similar for the uncertain assets.

In a decision making process with asymmetric information and a quality difference previous researches like Akerlof (1970), Afzal, Roland and Al-Squri (2009) and Emons and Sheldom(2002) use an uncertainty condition where no probabilities of quality difference are investigated. The paradox of Ellsberg states that people prefer risk towards quality more than uncertainty towards quality. This results in the following hypothesis:

H2a: More transactions will take place in an asymmetric information setting with known probabilities of the quality than with unknown probabilities of the quality.

In hypothesis H2a an increase in transactions is expected from known probabilities over unknown probabilities of quality. In a situation with known probabilities of the quality the agent with

asymmetric information will take more risk. When taking more risk the agent with more information has a bigger advantage. The agent with more information will take use of this risk taking behavior in an asymmetric information setting. This results in a following hypothesis.

H2b: *A higher price will be paid per transaction in an asymmetric information setting with known probabilities of the quality than with unknown probabilities of the quality.*

2.7 Value of Information

Previous Sections discussed quality differences in asymmetric information setting. In this setting one side of the market has better information than the other which leads to a competitive advantage. This Section will investigate the option of buying information to overcome this information difference. First the value of information will be discussed and later the role of information buying in decision making processes.

Section 2.1 discussed information as a commodity. Every commodity and in this case all information has a value. The value of information differs according to the situation. For example the value of information for young workers who can observe signals about their long-term productivity in the early stages of their career can be different than an entrepreneur who can obtain information linked to the profitability of his investment project (Gollier, 1999).

When the value of information is calculated, it is important to consider what part of information is valued. According to Brichler and Butler (2007) the value of information refers to the value of the information source, not the value of the actual information message, as information can only be sold before it is known by the buyer. Value of information is therefore always an *ex ante* concept as *ex post* it does not make sense.

Value of information is difficult to accumulate because several factors have influence on it. Brichler and Butler (2007) make use of several studies about the valuation of information and selected three factors influencing the valuation of information which are shown in Table 4.

Table 4. Factors influencing valuation of information

Stakes	The size of the payoffs. If information is bought, which advantage does it give.
Prior uncertainty	A higher uncertainty leads to more value of information
Precision of information	The more precise the information the higher the value

According to Hirshleifer, Riley (1992; p204) the range of actions which can be taken due to the information is the most important factor influencing the value of information. This action is different from the payoff as it is more focused on an active decision. The valuation of information often is a difficult subject. In research of Rötheli (2001) people had problems valuating information at the right

price. It is important to make clear what advantages does information have and how precise the information is.

The valuation of information can vary. In asymmetric information settings with quality difference, one side of the market has no information about the quality. Acquiring information can solve the information difference. The information which can be bought will make the asymmetric market symmetric because both parties have the same amount of information after the information is purchased. If the value of the information doesn't change but the acquisition costs of the information will be variable a higher price will lead to less buying of the information. A lower price will give people more incentives to buy information. This result in the following hypothesis

H3: A Lower price of information will lead to more acquisition of information.

When the information is bought, it will make the asymmetric information market symmetric again, as both parties have the same amount of information. In a symmetric market more transactions will occur according to Section 2.5. When information is bought in an asymmetric market more transactions will take place than in an asymmetric market where no information is bought. This results in hypothesis 4a.

H4a: More transactions will take place in asymmetric information settings where information is bought than in asymmetric information settings where no information is bought.

If information is bought all information about the quality uncertainty will be revealed. Both sides will have the same amount of information. In case of transactions there will be a lower price paid per transaction if the information is bought. More information will lead to a smaller information gap which can be exploited.

H4b: A lower price per transaction will be paid in asymmetric information settings where information is bought than in asymmetric information settings where no information is bought.

2.8 Perceptions and attributes in asymmetric information settings

Two information settings with quality differences were discussed in previous Sections, the symmetric information setting and the asymmetric information setting. Previous Sections showed ambiguity and information value influencing decision making in asymmetric settings. This Section discusses the role of attributes and perception in relation to asymmetric information in decision making. Decision making in relation to asymmetric information is discussed in the research of Afzal, Roland and Al-Squri (2009) which is shown in box 1. First the role of attributes is discussed in risk aversion and ethical behavior. Later in this Section the perceptions of trustworthiness will be discussed.

Decision making in asymmetric information setting differs from decision making in symmetric information setting. The biggest difference is the information availability between both settings. In symmetric information settings it is possible to see all strategies and all information of the other agent.

Agents don't need to take risk, as all choices can be made rational. Decision making in asymmetric information setting is discussed in box 1.

Box 1: Information asymmetry and decision making

"To understand the relationship between information asymmetry and decision making it is important to examine the consumer decision-making process (CDP), the role of information in that process, and finally the impact of change in the distribution of information on CDP. According to Blackwell, Miniard, and Engel, the CDP involves five steps: need recognition, search, evaluation, purchase, and post-purchase evaluation. Search usually includes the gathering of information about the product features that can be assessed before purchase, e.g., price and quality. As the extent of the pre-purchase information increases, buyers form a cognitive judgement regarding the quality of the product. Buyers use their cognitive sources to form beliefs about the product, which may increase or decrease the involvement of the buyer in relation to that particular product. The development of cognitive sources depends on the information available about the product. The available information develops the frame of reference, which influences the perception of the value of the product. The interaction of a buyer with the information forms their attitude, which, along with subjective norm and perceived behavioural control, determines the intention towards actual behaviour.

According to Olshavsky, Moore, and Lim, two attributes of a decision problem affect the decision maker: the number of alternatives and the nature of information available. The nature of information was further decomposed into its amount, quality, and format. Olshavsky and Smith argued that the nature of information will influence the search process of a buyer. The extent of distribution of information between a buyer and seller can impact the nature of the available information by changing its amount, quality, and format. Organizations, owing to their position, expertise, and experience with the production of a certain product, can acquire greater information relating to the true value of the product. Buyers combine information from their personal experience, advertisements, word of mouth, and search to determine that value in the market. Buyers, due to their own unique position, possible lack of experience with the product, and excessive search costs, may not be able to acquire all the relevant information and may therefore enter the transaction with asymmetric information.

A buyer does not rely solely on the information available through external sources such as advertisements. Individuals use their personal product experience and integrate it with the current information to evaluate a choice. According to Levin and Gaeth, the nature of the attributes that have been promoted within an advertisement provides a framing context, which affects product judgements.

Multiple sources of information form the contextual environment that is used by an individual to value the product. In addition, the individual perception of product attributes impacts the resultant information processing. Asymmetric information creates a contextual environment in which a buyer (in the case of complete absence of past experience) finds few cues that can be used to value the product, and consequently undervalues it." *(Original in Afzal, Roland and Al-Squri (2009) p.196 References left out)*

In asymmetric information settings the stakeholder with less information has a disadvantage. Due to the lack of information there is uncertainty in the decision making process. The uncertainty will make personal and interpersonal cues more important. This research will focus on the attributes risk aversion of the buyer, trustworthiness from the buyer towards the seller and the perception of ethical selling by the seller.

Risk aversion

Risk aversion affecting decision making is proven in different situations, from investment decisions (Al-Ajmi, 2008) to medical decision making (Armijo, 1999). Risk aversion is a personal attribute which differs across persons. One person can be more risk averse than others (Gollier, 1999).

The asymmetric information setting leads to an uncertain position for the person with an information disadvantage. The quality difference gives one person the information about the quality, while the other has to guess the quality when no information is available. If there is no information available the uncertainty about the quality leads to a risk calculation. The risk calculation concerns the expected quality before the decision making process and the chance in case the quality afterwards is similar to the expected quality before. If there is no information about the quality the decision will be made under uncertainty. Research of Ho (2009) shows empirical result of risk aversion in relation to uncertainty. Here people had to gamble and risk aversion was positively related with uncertainty.

This thesis is focused on decision making in asymmetric information settings with uncertainty about the quality. Due to the information asymmetry and the quality uncertainty high risk aversion will lead to less agreements in a decision making process. Less risk will increase the agreements of risk aversion. The following hypothesis is formulated

H5: High risk aversion leads to fewer transactions in asymmetric information market

Trustworthiness

Within decision making trust in another person is a widely studied perception. Trustworthiness of the seller will increase the amount of deals in investment games played by Becchetti and Conzo (2010). Trustworthiness is closely related with reputation as reputation is an indicator for trustworthiness of a person (Resnick et al., 2006).

Two levels of trust can be separated from each other. Individual-level trust, which is focused on trust between individuals, and system-level trust, which is more focused on system regulation protocols and mechanisms (Ramchurn et al., 2004). This research is focused on decision making between individuals the individual level trust is more important.

Trust is investigated in channel negotiation by Srivastava and Chakravarti (2009). They found evidence for the fact that more trust from a buyer in a seller will lead to a shorter bargaining duration and a better deal for the seller. This research is focused on negotiation decision making between two people with quality uncertainty. A high trustworthiness from buyer to seller will increase the amount of transactions in a decision making process. The following hypothesis can be formulated.

H6: Higher trustworthiness leads to more transactions in asymmetric information market

Ethical behavior

In asymmetric information settings one side of the market has more information than the other side. The side with more information has an information advantage and can make use of this advantage during negotiation. Resnick et al. (2006) found evidence that internalized ethics lead to good behavior even if there is no direct economic reward. Within the real estate market, the real estate agent has more information than the buyer. Moral decision behavior is proven in the real estate market by Tesfom and Birch (2011).

Ethical behavior or moral decision behavior influences the decision making process. The ethical behavior perception of the side with more information will increase the honest negotiation. With more honest negotiation and more open information there will be more transactions. The following hypothesis can be formulated.

H7: Within asymmetric information settings and quality uncertainty, more information and a high perception of ethical behavior of the other negotiation party leads to more transactions.

2.9 Research model

In previous Sections this research discussed factors influencing decision making during negotiations in different information settings. The seven hypotheses build up the following research model seen in Figure 3.

The research model is divided into two Sections, on the left the symmetric information Section and on the right the asymmetric information Section. Both situations lead to a negotiation and transaction, but in a different information setting. In the symmetric information setting only quality difference is used to influence decision making, no other variables are measured.

In the asymmetric information settings more variables are used to investigate the decision making. Risk aversion, ethical behaviour and trustworthiness will be measured. Value of information and ambiguity will be changed to influence decision making.

In the research model the hypotheses are indicated by H. The Sections in which the hypotheses are described are indicated by section numbers. Variables measured are surrounded by a box and variables influencing the model are surrounded by a triangle.
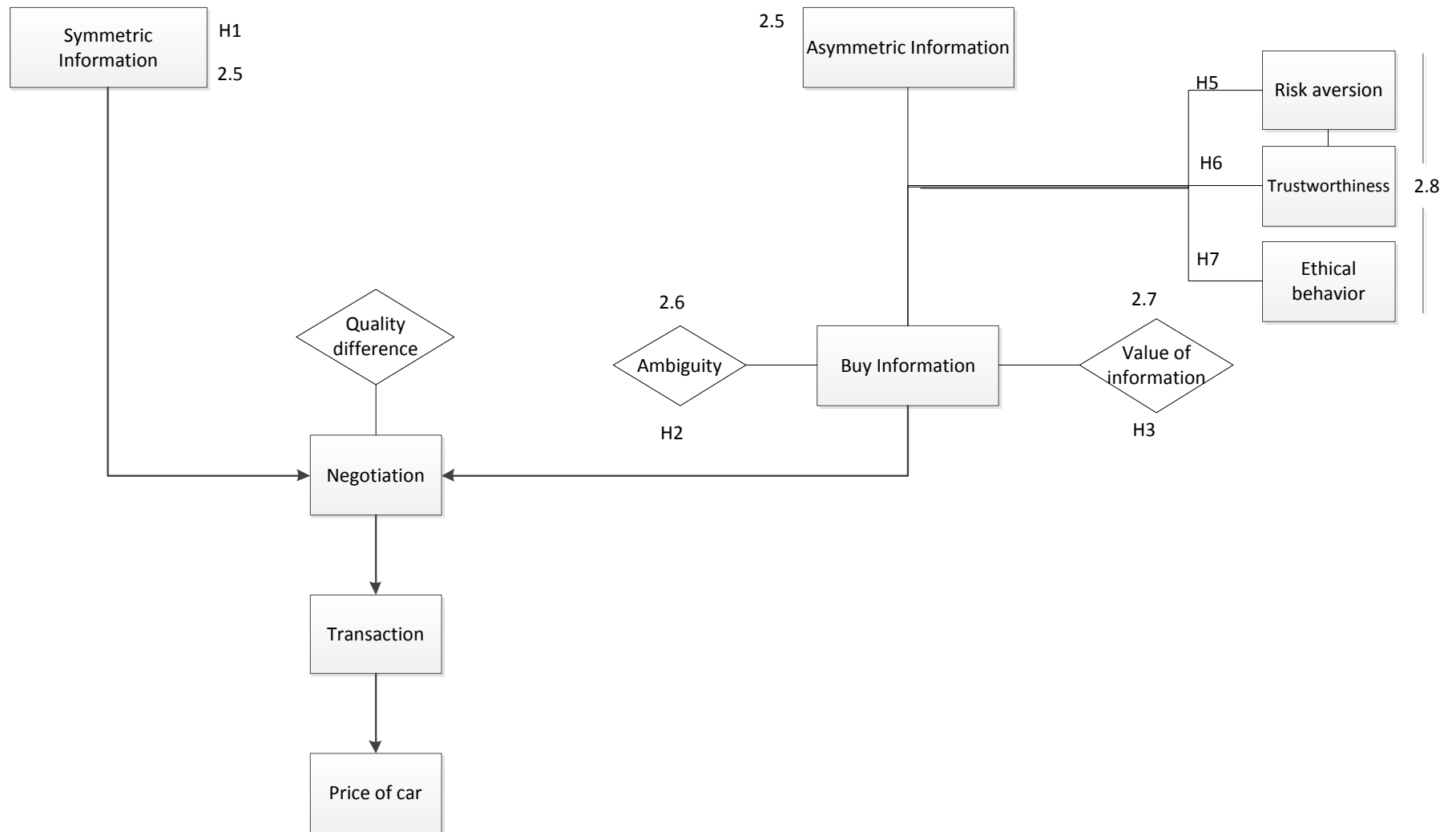
Figure 3. Research model, H= hypotheses, number = section number

3. High school economic education

Economics courses at high schools in the Netherlands are changing (SLO, 2011). During study year 2011 – 2012 a new approach to economics courses will be implemented by the ministry of education, culture and science represented by the committee Teulings (2005). In this new style of economics courses there are changes in the way of teaching and the topics being taught. Within this chapter the new approach of economics courses will be discussed. In this section the different teaching styles introduced by Teulings (2005) will be discussed. This research will use several topics and teaching styles to be discussed in Section 3.2.

Economics program overview
The new economic courses are described in the report of Teulings (2005). Leraar24 is an online platform helping teachers and education systems to improve their education system. They have a special Section for the new economics courses program. Both sources are used to describe a global overview of the economics program.

The economic courses will be focused on the concept of context handling. Concepts will explain the theory of economics and students should be able to translate these concepts to different situations. Students should recognize concepts and make use of these concepts in different contexts (leraar24, 2011).

The use of economics in practice gets more important when it comes to previously discussed context situations. Less theoretical knowledge is needed, but more active use and recognition of economic subjects is asked for. The students and teachers should be able to make a link between practice and theory in different situations (Teulings, 2005).

Classroom experiments are an additional way to help students understand abstract topics better. It becomes obligatory for teachers to conduct classroom experiments and games during the economics courses. A classroom game is interactive and makes theoretical abstract topics more reachable for students (leraar24, 2011).

High-schools in Netherlands include in their teaching programs eight core economic topics (Teulings, 2005). Within the next Section the research will discuss in more detail the topics which are related to this research and the possibilities of doing scientific experiments within economic courses.

3.1 Guidelines government for teaching economics

This section considers two important aspects of the economics teaching program. The research combines classroom experiments and together with several topics in the economics courses it creates a new game for the use in economics courses for high schools in the Netherlands. First the Section will explain the guidelines for classroom experiments and later in this section it will cover the relevant domain in economic field and topics of economics.

Classroom experiment guidelines

Classroom experiments will be an important part of the economics course program for high schools in the Netherlands. Teachers need to spend time on classroom experiments but are free to choose which form or type of classroom experiments they use (SLO, 2011). Classroom experiments can be conducted in different styles, such as: Web-based simulation games, surveys and classroom behavioural games (experimentenvoorindeklas, 2011). The committee Teulings (2005) assessed several guidelines for classroom experiments:

- A student must have upfront expectations about the experiment and should have time to think about the experiment. There should be an option in the experiment to check whether the expectations are met at the end of the game or not.

- Experiments should be as simple as possible, with no additional or irrelevant information in it (Dixie, 2004). It should learn a student abstract economic theory which can be translated to real life after the experiment.

- After the end of the experiment a discussion could be started. The discussion should be focused on the outcomes of the experiment. The outcomes should be discussed and a confrontation between expected decisions and actual decision should be an option.

- It is important for the student to have the possibility to translate the experiment to a different context.

Experiments which meet the criteria should be found by the teachers of economics at high schools by themselves. The recommendation of Teulings (2005; p.36) on this issue, was more collaboration between universities and high schools, where universities could do scientific experiments in exchange for the creation of a classroom game.

Topics

The "college voor examens"(exam committee) is empowered by the Ministry of Economic Affairs, Agriculture and Innovation to set a norm for economics courses for high schools. The exam committee selected eight topics which should be studied by students in order to pass the national exam. Together with the committee Teulings (2005) and SLO (2011) eight economic topics are selected which will be examined during the national exam. Students who study economics at high schools should be able to understand these eight topics:

Module 1 Scarcity
Module 2 Exchange
Module 3 Market
Module 4 Dynamic choice
Module 5 Collaboration and negotiation
Module 6 Risk and information
Module 7 Growth and welfare
Module 8 Economic good times and bad times

Theory used in Chapter 2.0 is related to modules 2, 5 and 6. These three modules of Teulings (2005) are related to this research. The exam committee worksheet on economics (2009) will serve as a guideline to give a short summary of these three topics

Module 2 Exchange
The exchange of goods and resources is a central issue in this module. The student should be able to analyse an exchange transaction and learn how optimal supply and demand work. The student learns how everybody wants to have the optimal deal. A close look will be given to the transaction costs. What costs are influencing the exchange? A short introduction will be given to markets with asymmetric information, but will be handled more in depth in modules 5 and 6.

Module 5 Collaboration and negotiation
A student is able to analyse different stakeholders and different individual interests in decision making. While individuals want to go for the best outcome, is this also the best outcome for other stakeholders next to this individual? What factors are important in collaboration and individual negotiation, for example trustworthiness?

Module 6 Risk and information
Not all choices of people are made under full information settings. Most of the time there is uncertainty involved in decision making. People try to gather more information to reduce this uncertainty. This module will teach students how to cope with different information settings.

These three modules give a short description of topics in the national exam of high schools. In Section 3.2 this research will combine the theory in Chapter 2.0, the guidelines for experiments and economics topics to create learning goals for students.

3.2 Learning goals

This research wants to create a classroom experiment for economics courses at high schools. The previous Section showed the guidelines for an experiment and the guidelines for the topics dealt with economics courses which are related to this research. This Section will demonstrate the learning goal of the classroom game by providing learning outcomes of the game. A learning outcome is defined by the European Commission as:

" Intended learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate after successful completion of a process of learning" (EU, 2004).

The education institute of Wageningen University, OWI, (2010) created a framework which describes the learning outcome. This framework is used to create the learning outcomes of the simulation game.

Learning outcomes

A learning outcome exists of several learning features which are mastered by the student. In this Section different learning outcomes concerning information settings are presented in this game. Three learning outcomes are considered to be important for the game:

Learning outcome 1
A student should be able to explain what the difference is between an asymmetric and symmetric information market.

Learning outcome 2
A student should be able to recognize different information settings in real life.

Learning outcome 3
A student should apply negotiation tactics in future situations concerning asymmetric information.

The following learning outcome is a result of these three separate learning outcomes:

"After successful completion of this game students are expected to be able to explain, recognize, apply and negotiate in different economic information settings".

4. Methodology

In Chapters 2 and 3 the theoretical domain and economics courses at high schools were discussed. This Chapter shows the methodological side of the research. By constructing an experiment for high schools several issues should be considered. In Section 4.1 a definition of simulation games is discussed together with elements needed in a simulation game. Previous classroom games are studied and based on these results a new game is created. Section 4.2 gives a description of the game and the procedure how to play the game. In Section 4.3 the scientific approach is presented to support the hypotheses.

4.1 Simulation games

Previous Chapters dealt with games in general. This Section will describe the difference between a game and a simulation game.

For more than 40 years simulation games are used in research (Chin, Dukes, Gamson, 2009). Throughout these years different definitions of simulation games are given. The research of Meijer (2009) shows a literature review of definitions on simulation games. The outcome of this literature review resulted in a new definition. This research uses the same definition:

"Simulations can be defined as studying the effects of human behaviour or decisions on some key variables in a model that represents a real-world system. A game can be defined as a clearly delineated activity with its own roles, rules and incentives, carried out for its own sake. A gaming simulation is a simulation of a real-word system in the form of a game. This implies that the roles, rules and incentives of the game mimic some real-world phenomenon" (Meijer and Hofstede 2003).

The main difference between a simulation game and a normal game is the real life simulation effect. A simulation game is more focused on the real world and simulates the real world. The focus of the game is to simulate a real life scenario. A normal game is more focused on the gaming element than the simulation element. The context of the game is less important. This research will use a simulation game to make the game as realistic as possible.

The design of a simulation game includes several necessary elements. Table 5 gives the elements needed in a simulation game. They are used in Figure 4 where the design of a simulation game is given.
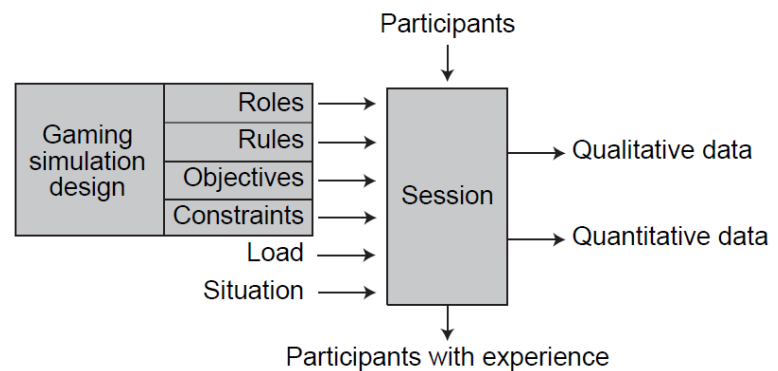
Figure 4. Gaming simulation design, Meijer 2009

Table 5. Elements in simulation games, adapted from Meijer (2009)

Roles:	Participants of gaming simulations are playing different roles. These roles can be either chosen or given by the organization of the simulation game. These roles do not match with the roles of participants in real life. In simulation games roles are fictional but simulate roles used in the real world.
Rules:	Rules are needed to set boundaries of the game in gaming simulations. These rules can be similar on rules in the real world to make the game more realistic. Rules can be made for each player and for all players.
Objectives:	The objective of the simulation game will be the incentive for the participants to play. Objectives are made so the gaming element will be clear.
Constraints:	Limitations of the game are given by constrains. Constraints shape the game as they define what is allowed or forbidden. For example a constrain can be set on the maximum amount of money a participants get or a time constraint.

If simulation games are to be used in experimental settings two elements should be added to the game to measure and manipulate variables. Table 6 shows both elements.

Table 6. Additional elements in research simulation games, adapted from Meijer (2009)

Load:	The load of variables can be manipulated to compare different outcomes in a gaming simulation. Variation can be in an amount of money, variation in time, or other variables which can be changed by load.
Situation:	The situation element can be described as all variables that surround a session but are not part of the design. The situation element gives the researcher a view of the environmental effects on the game. What kind of participants are involved? What is their social background, but also questions like is the game played in the same room and condition? All these variables outside the variables in the simulation game design are included in the situation element.

Simulation games can be used in many research disciplines, from medicine to management and education (Chin, Dukes, Gamson, 2009). This simulation game will be used in educational settings. Box 2 gives a global overview of simulation games used in education. This research is not focused on the education side, but on the research side, as the simulation game is used as an experiment.

Box 2: Education and simulation games

Simulation games are more and more used in education systems. The studies in the past aimed to see if simulation games affect the learning behavior of students. Some of them show significant higher learning results on simulation games than on traditional lessons (Emerson 2004, Dickie 2000). Other studies show only a higher motivation of students (Prensky 2003). Simulation games will be used more often in education to stimulate students to work harder and learn easier (Squire 2005). skeptic people will always think games are just made for children and not for serious purposes (Sutton-Smith 1997) but I think a better motivation will lead to a higher education result of students.

Previous games

Previous Sections discussed in general simulation games in experimental settings. Literature study showed several classroom games based on asymmetric information, quality differences and negotiation. These games are a good example how a simulation game could be played within high schools. Every classroom game has its own focus and attributes. In Table 7 a review of related classroom games is shown.

Five attributes of the games are selected which together identify a game uniquely. A combination of these attributes is the basis of a new game created in this research. The "car game" is played during economics courses at high schools. By using multiple rounds it will be possible to play the game in different information settings and this makes it easier to discuss it afterwards. The duration of the experiment will be around 20 minutes, including discussion and playing the game, to make it fit into the economics courses. The time constraint leads to a two-round game which will take around 5 minutes per round and leaves space for discussion of the game afterwards.

During negotiation the quality difference will be the main difference to negotiate about. The quality difference of the product gives different values to the product, in this experiment a high quality product is worth more than a low quality product. A quality difference in the game will lead to an incentive to negotiate about.

The simulation game of Hofstede and Verwaart (2008) uses an option to buy information. This option is a good instrument to show participants the effect of information value. It gives the participants an option to receive information about the quality of the product. This is a nice attribute to simulate a real world, where information purchase is often possible.

The car game does not include feedback and reputation. The game of Wolf and Myerscough (2007) lets participants rate other participants. By rating another participant feedback is given which can be viewed by other participants leading to reputation. The game takes too many rounds and a short game is preferred with only two rounds. These two rounds make it impossible to create a reputation system. If there would be more time for the game a reputation attribute will be an option.

The attribute uncertainty/ risk is used in the game of Anderson and Holt (1996). In this game there are two situations where participants can choose a product. In one situation the probabilities of choosing a good or bad quality product are known, while in the other situation there is no information about the probabilities of choosing a good or bad quality product. This attribute will show the difference in risk behaviour of participants and can be discussed afterwards.

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Table 7. Comparison of related previous simulation games

	Hofstede and Verwaart (2008)	Holt and Sherman (1999)	Wolf and Myerscough (2007)	Anderson and Holt (1996)	Car game
Multiple rounds[1]		x	x		x
Quality difference[2]	x	x	x	x	x
Buy information[3]	x				x
Feedback/ reputation[4]			x		
Uncertainty/risk[5]				x	x

Legend
1. Multiple rounds: The game consists of multiple rounds.
2. Quality difference: Quality difference of the object involved in the game to negotiate about.
3. Independent check: Possibility to buy information about the product or user.
4. Feedback/reputation: Possibility to give feedback or to see reputation information about the other user.
5. Uncertainty/Risk: Is there an uncertainty or risk possibility in the negotiation setting involved.

4.2 Game description

The previous Section showed why simulation games are used for experiments and gave an introduction to several games used in previous studies. This Section will examine the description of the simulation game designed for this research. It will give an overview of the game and how it should be played.

Game design

The simulation game which is created for this research is called "car game". This name is chosen as two persons are negotiating about a used car in the game.

Setting: two players per game, one buyer and one seller

Figure 5. Start setting of car game

The game is a negotiation between two people about a used car. They will sit in front of each other to negotiate. One player will be the buyer, while the other player will be the seller of the used car. The role of buyer and seller will not change between rounds and lasts from the beginning till the end of the game. Figure 5 shows a start setting of the game.

Rounds: two rounds each with a duration of five minutes

There will be two negotiation rounds with a duration of five minutes each. Before each round instructions for the upcoming round will be given.

Aim of the game

The aim of the car game varies for both players. The seller has to sell the car at the highest price to win the game and the buyer has to buy the car for the lowest price to win the game.

Types of cars: High and low quality

During the game there will be two types of cars. One car is a well-maintained used car which is called high quality car. The other car is not well maintained and is called a bad quality car. The price for both cars varies from €1400 for a high quality car and €500 for a low quality car.

Budget:

The budget available to buy a car is €2000 for the buyer. The price of the car is lower than this amount. In both rounds the seller starts with €2000 and the money earned in the first round will have no influence on the next round.

Round 1

In round 1 both players (seller and buyer) get an instruction card with information about their negotiation position. The buyer starts with a budget of €2000 and the seller wants to sell the car at the highest amount of money. There is only one variable in this round as seen in Table 8.

Table 8. Car quality variable round 1.

High quality car	Low quality car
€1400	€500

In round 1 **both players know the quality of the car** which means the quality information of the car is visible for both players. There is a symmetric information market where both players have the same information about the product (used car) as the other. In Figure 6 a scheme of round one is given, where both players negotiate under the condition of full information.
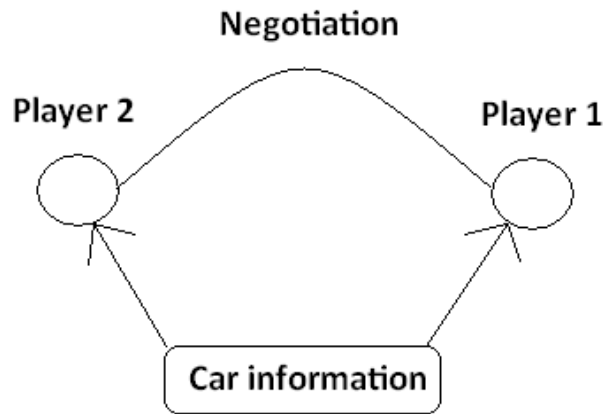
Figure 5. Round 1 process.

Round 2

In round 2 both players (seller and buyer) get an instruction card with information about their negotiation position. The buyer starts with a budget of €2000 and the seller wants to sell the car at the highest price of money. There are multiple variables in this round and these will be discussed one by one. The first variable is the same variable as in round 1. In Table 9 the variable quality of the car is shown.

Table 9. Car quality variable round 2

High quality car	Low quality car
€ 1400	€ 500

The difference between round 2 and round 1 is the availability of information about the product (car). In round 2 **only the seller has the information about the quality of the product.** In Figure 6 the basic condition of round 2 is shown. Only player 2 knows the quality of the car. This creates an asymmetric information market where player 2 knows more about the product than player 1.
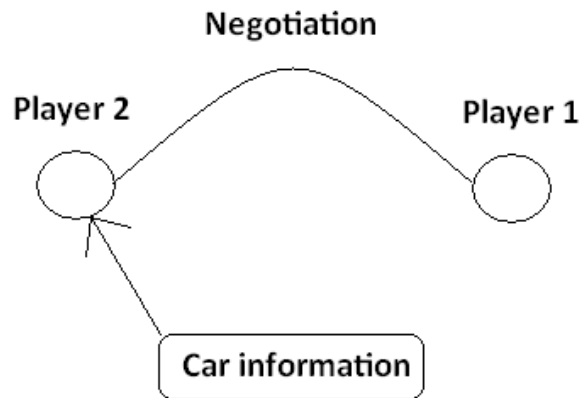
Figure 6. Basic model round 2.

The basic model (Figure 6) of round 2 shows an asymmetric information market. There are more variables in this round, but we continue on the model in Figure 7. Table 10 shows the variable uncertainty/ risk. There are two conditions between-subjects which influence the buyer. The first situation is uncertainty, where nothing is said about the distribution of quality. The buyer doesn't know how much high quality and how much low quality cars are in the game. The second situation is the risk situation, where the buyer knows the chance of the car to be high or low quality.

Table 10. Uncertainty/ risk variable round 2.

Uncertainty	Risk
No probability information	50-50 probability

The model in Figure 7 can be extended with the variable of uncertainty or risk. In Figure 8 the uncertainty or risk variable is inserted in the model. Player 1 is informed about the probability to a good or bad car. In the first situation there is no probability information (uncertainty) while in the second situation the probability of 50% is given (risk).
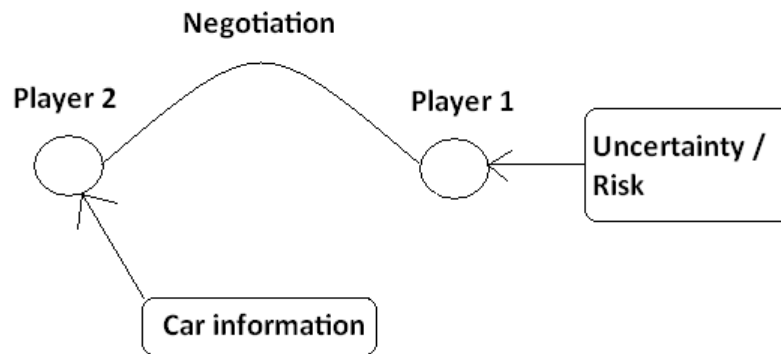
Figure 7. Basic model round 2 extended with uncertainty and risk.

In the real world there is often an option to get information about a product when there is an asymmetric information distribution. In this game and in round 2 it will be possible to get information about the product as well. An independent check gives the information about the product. In Table 11 the three conditions of the check are described. The difference between the checks is the price.

Table 11. Check variable round 2.

Low price check	Medium price check	High price check
€0	€50	€200

Only 1 check is used per game. This can be the low, medium or high price check. In addition to Figure 6 and 7 the model gets another extension in Figure 8. Player 1 is able to buy information and receive the information about the quality of the product. Both players have to negotiate how to divide the payment of the check costs. This can be one person who pays all or both players paying.

Figure 8 gives the model of round 2 with the variables: quality, uncertainty/risk and check. In the answer sheet, which can be found in the appendix, all variables will be inserted.
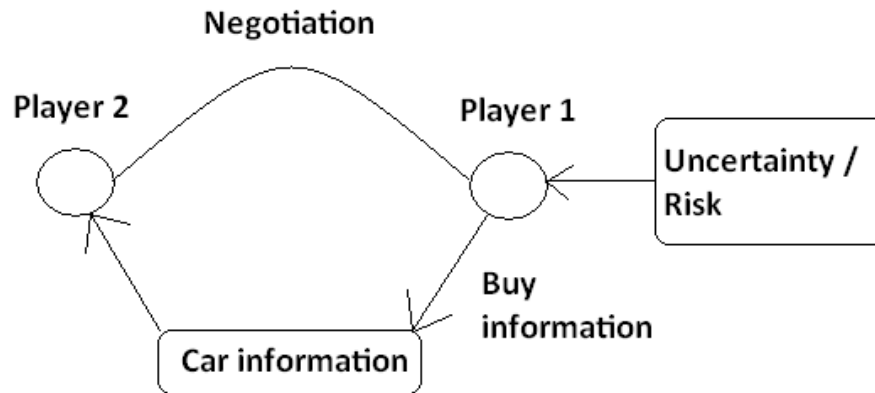
Figure 8. Complete car game model

Execution of the game

In the previous Section the description of the game is given. In this Section the execution of the game will be discussed. The game is played by pairs of two students. There can be unlimited pairs of students playing the game, but the game can only be played once per player. Otherwise the player has experience and has a competitive advantage (Meijer, 2009). The game is played at high schools in the Netherlands under supervision of two student assistants.

The student assistants are running a "mobiel practicum" at high schools. "mobiel practicum" is an experiment road show by the university of Wageningen where several experiments are played with students of high schools to introduce topics of Wageningen University to them. Mobiel practicum exists of four games and one of the games played will be the car game. Student assistants will execute the game in the following format.

Introduction →Round 1 → Introduction round 2 → Round 2 → Explanation of theory

The introduction will tell students the rules of the game and the student assistants will deliver the instruction cards to the players. When the instructions are finished the information cards of the cars (high-low quality) will be distributed to every pair of students. After round 1 an introduction will be given to round 2. In round 2 there is a new instruction card and the cards for the cars will be distributed only to the seller. After round 2 there will be an explanation of the theory learned in the games and confront the students with the learning outcomes.

4.3 Scientific approach

This Section will describe the scientific approach and used materials in the experiment. First the materials used in the experiment will be explained and presented. The selection of participants will be described in Section 4.3.2. Section 4.3.3 will operationalize the hypotheses from Chapter 2 to make them suiTable for the experiment.

4.3.1 Research materials

The simulation game is supported by research materials which are collected in different phases of the game and analysed afterwards. The research materials consist of three questionnaires and one answer sheet. This Section will discuss the questionnaire and answer sheet.

Questionnaire

The research is going to measure three constructs included in the research model (Figure 3). Unethical behavior, trustworthiness and risk aversion will be measured by making use of questionnaires. The questionnaires use existing and tested scales from Bruner, Hensel and James (2005). These scales are tested on reliability and validity in previous studies and makes them suitable to use them in this research. In the appendix the questionnaires are shown.

Unethical behavior

Lagacy, Ingram and Boorom (1994) created a scale on unethical behavior of a salesperson. They used a 7-point Likert- type scale to judge every item. Multiple tests showed the reliability of the test. This research uses three out of the fifteen items to construct a reliable factor on unethical behavior which can be used for analysis. The three selected items represent the seller's perception of unethical sales behavior and are focused on the product quality.

Trustworthiness

Tax, Brown and Chandrashekaran (1998) extended the research of Crosby, Evans and Cowles (1990) to create a four-item scale to measure trust in the organization. The scale of Price and Arnould (1999) is more focused on trust of the service provider. Both scales are focusing on trust towards an organization. This research applied the scale to a person and selected two items from Price and Arnould (1999) which are focused on feelings towards an organization and one item from Tax, Brown and Chandrashekaran (1998) which is focused on the perception of trust in the other person.

Risk aversion

Scot et al. (1998) created a scale to measure risk aversion. A four-item scale resulted in a reliable factor of risk aversion measured with a 7-point Likert-type scale. This research uses three of these items to create a factor for risk aversion. These are focused on product and certainty in decision making.

Answer sheet

The answer sheet in the experiment is registers the outcome of the game. Figure 10 shows the answer sheet where participants of the experiment have to fill in their negotiation result. In appendix a legend is given for the answer sheet. In round 1 there is a symmetric information setting and in round 2 an asymmetric information setting. In round 1 the answer sheet will show if there is a deal and which price is paid for the car. In round 2 there is an addition to these variables, namely contract and test used. Contract will show if both people made an agreement and the test used shows if the group used the option to buy information about the product.

	Car Quality		Deal		Salesman result	Buyers result	
Round 1	High/low		Yes/No		....	....	

	Car Quality	Contract	Deal	Test used	Salesman result	Buyers result	Version
Round 2	High/low	Yes/No	Yes/No	Yes/No	....	....	A/B

Figure 9. Answer sheet car game

4.3.2 Participants

The participants used in this classroom experiment are 4th or 5th grade students of high schools (4 and 5 VWO/ Gymnasium). The classes participating in this experiment are from all over the Netherlands. The appendix includes a list of visited schools.

4.3.3 Operational hypotheses

Previous Sections of this Chapter discussed the methodology of the research. This Section will operationalize the hypotheses from Chapter 2 so they can be used to analyse the results of the car game. The car game is divided in two rounds. The first round contains a symmetric information setting; the second round will contain an asymmetric information setting. Both of the two rounds are played by the same couple and both players keep the same role in both rounds. Hypotheses will be discussed one by one regarding how they can be tested.

H1a: There will be more transactions in a symmetric market than in an asymmetric market
To measure the difference in transactions in a symmetric and asymmetric market, the amount of transactions in round 1 and round 2 will be measured. As round 1 is measuring a symmetric information setting and round 2 an asymmetric information setting, the difference will show whether there are more transactions in round 1 or in round 2.

H1b: A lower price will be paid per transaction in a symmetric market than in an asymmetric market
By comparing the prices paid per transaction between round 1 and round 2 this hypothesis can be tested, conditional on transactions taking place.

H2a: More transactions will take place in asymmetric information settings with known probabilities of the quality than with unknown probabilities of the quality.
A comparison between the amount of transactions in version A compared to the amount of transactions in version B will result in the outcome of this hypothesis.

H2b: A higher price will be paid per transaction in asymmetric information settings with known probabilities of the quality than with unknown probabilities of the quality.
The prices paid per transaction can be compared on version A and on Version B. The outcome will give a clear result of the price differences between both versions.

H3: A Lower price of information will lead to more acquisition of the information.
The prices of information are divided into three groups. The research will compare the prices of information in relation to the actual buying of information. The results will show whether more information is bought when the price for information is lower.

H4a: More transactions will take place in asymmetric information settings where information is bought than in asymmetric information settings where no information is bought.
The number of transactions in the asymmetric information setting is measured. A comparison is made between people who did buy information and who did not buy information.

H4b: A lower price per transaction will be paid in asymmetric information settings where information is bought than in asymmetric information settings where no information is bought.
A comparison can be made between the price paid per transaction and the option to buy information. The comparison will show the difference paid per transaction if information is bought or not.

H5: High risk aversion leads to fewer transactions
By using scales it is possible to calculate a score for risk aversion. If risk aversion is compared with transactions this hypothesis can be tested.

H6: Higher trustworthiness leads to more transactions
Similar to H5 a score can be calculated for trustworthiness, by using this score and compare it with transactions this hypothesis can be tested.

H7: Higher ethical behavior leads to more transactions
A similar way of comparing to H5 and H6 is used to calculate the hypothesis of H7. Ethical behavior will be calculated and compared to transactions.

5. Analysis

In previous Chapters theory and methodology of this research is discussed resulting in a research model in Section 2.9 and operationalized hypotheses in Section 4.3.3. In this Chapter the data collected in the experiment will be analyzed and the hypotheses will be tested. A screening of the data will be discussed in Section 5.1, in Section 5.2 the data reduction of the variables trustworthiness, ethical behavior and risk aversion will be discussed. Section 5.3 will test the hypotheses.

5.1 Data screening

During the experiment 340 games were played in 30 classes. Each game was played by two persons representing one seller and one buyer. In total 680 people played the car game. Every group was given a separate group number, when this number was not on the answer sheet it could not be used for analysis. 23 groups did not fill in their group number and were left out of the dataset. A total of 317 groups filled in the group number and were analyzed. Both frequency analysis and descriptive analysis gave plausible values. Partial missing values in the answer sheet are not taken out of the dataset as other values could be used in the dataset.

There are six different conditions in which the game was played. Three different prices of information settings and two different versions: A uncertainty and B risk. In Table 12 the number of games played per condition are given.

Table 12. Number of games played per version

		Price of information			
		0	50	200	Total
Version	A	23	17	149	189
	B	0	18	110	128
Total		23	35	259	317

Table 12 shows condition B with free information is not played. Also the conditions 0 and 50 are less played than the 200 version. During the analysis this is taking into account.

5.2 Data reduction

The research investigated three constructs from Section 4.3.1. Every construct was measured by 3 items with a 7-point Likert-type scale. A Cronbach Alpha shows the reliability of the constructs. Table 13 gives an overview of the reliability study. Trustworthiness and risk aversion show a high Cronbach Alpha of

(>0.7). The items give a reliable indication of the constructs. The Cronbach Alpha score for ethical behaviour is quite low (0.58). No higher Cronbach Alpha can be realized by deleting items.

Table 13. Reliability study constructs

Construct	# items	Alpha	Mean	Sd	Items
Trustworthiness	3	0.95	13.86	5.61	Sense of confidence
					Trust in seller
					Trustful impression seller
Risk aversion	3	0.75	17.07	3.31	Risk taking
					Avoid risky business
					Choose the safe side
Ethical behavior	3	0.58	11.86	3.7	Interest in own profit
					Exaggerate product benefits
					False product information

Factor analysis is used to check the low Cronbach Alpha of ethical behaviour. Factor analysis showed one factor explaining 54.7% variance. The loadings of the items in the component matrix are between 0.77 and 0.70 which indicates an equal distribution of item importance.

The results of the factor analysis and due to practical reasons the construct ethical behaviour will be used in this research as one construct based on the three items.

5.3 Hypothesis testing

In previous Sections the research was focused on the screening of data and the reduction of data to make it ready for statistical analysis. In this Section the data will be used to test the give hypotheses from Section 4.3.3.

5.3.1 Number of transactions and price

This Section will discuss the difference in an asymmetric market and symmetric market in relation to the number of transactions and the price paid per transaction. The results will show if there is a difference in decision making between information settings. Theory related to this Section can be found in Section 2.5.

First the number of transactions will be compared between both information settings. Later in this Section the price paid per transaction will be discussed in both information setting.

H1a: There will be more transactions in a symmetric market than in an asymmetric market

To measure the difference in transactions between round 1 (symmetric market) and round 2 (asymmetric market) a McNemar test is used. McNemar test is a non-parametric test for two related samples where there is nominal rather than ordinal data (Field 2005). Transactions are given either as 0 (no transaction) or 1 (transaction) in both rounds.

The comparison of round 1 and round 2 in transactions resulted in a significant outcome. The results in Table 14 show a difference between round 1 and round 2 in transactions.

Table 14. McNemar test, transactions round 1 and round 2

	N	Chi-Square	Sig.
Round 1 & Round 2	316	7.347	0.007

The McNemar test showed a difference in number of transactions between round 1 and round 2. Comparison of the mean results in a direction of the difference which could be positive or negative. In Table 15 the different means are given, which shows a negative direction of the outcome. In round 2 less transactions (M=0.80) took place compared to round 1 (M=0.88).

Hypothesis H1a is accepted. There are more transactions in a symmetric market than in an asymmetric market.

The results of this experiment show a difference in decision making between a symmetric information market and an asymmetric information market. It can be seen that information settings are influencing decision making. The difference in mean between both rounds is only 10%. The high number of participants (N=316) resulted in a small difference to be significant enough.

Table 15. Means of transactions round 1 and round 2

	Mean	Std. Deviation
Round 1	0.88	0.329
Round 2	0.80	0.400

H1b: There will be a lower price paid per transaction in a symmetric market than in an asymmetric market

There are four different quality situations possible in the experiment. In Table 16 the different situations are given between quality in round 1 and quality in round 2. Measuring the difference in transactions between a symmetric market and an asymmetric market makes it impossible to compare all situations. Situation 2 and situation 3 give a different condition of the quality.

This experiment is done between subjects, so it is not possible to compare the mean of two different quality settings between round 1 and round 2. Therefore it was decided to look only at the relation in situation 1 and situation 4.

Table 16. Quality situations round 1 and round 2

	Situation 1	**Situation 2**	**Situation 3**	**Situation 4**
Round 1- Round 2	High-High	High-Low	Low-High	Low-Low

In situation 4 with low quality in both rounds the mean of round 1 (M=895.98) was different from the mean in round 2 (M=1070.74). In Table 17 a dependent T-test was conducted on this mean. It resulted in a different mean price for a car paid in a symmetric market and an asymmetric market with a higher price paid for a car in an asymmetric market.

In situation 1 with high quality in both rounds the mean of round 1 (M=1660.29) was different from the mean in round 2 (M=1685.04) however, the difference is not significant which can be seen in Table 17.

Table 17. Dependent T-test price difference symmetric market and asymmetric market

	Mean difference	*Std. error mean*	*T*	*Sig.*	*R*
Low Quality	-174.76	69.51	-2.514	0.014	0.298
High Quality	-24.75	33.63	-.736	0.465	0.099

Hypothesis H1b is partly accepted. In a low quality setting there is a significant difference between price paid per transaction, but there is no significant difference with high quality cars.

The asymmetric information setting makes the quality of the car unknown for the buyer. Only in a low quality setting a difference can be found in price paid per transaction between round 1 and round 2. Buyers who are confronted with a high quality car are not paying a higher price.

5.3.2 Uncertainty and Risk

The car-game was divided in two versions to research the role of ambiguity in asymmetric markets. Version A gave a version with unknown probability of the quality and version B gave a version with known probability of the quality. The difference between risk and uncertain towards asymmetric information is discussed in Section 2.6.

In H2a the difference in number of transactions is analyzed in relation to risk and uncertainty. Later in this Section H2b analyzes the difference in pricing per transaction in both settings.

H2a: More transactions will take place in asymmetric information settings with known probabilities of the quality difference than with unknown probabilities of the quality difference.

The hypothesis expected more transactions in version B. Using cross tabulation the number of transactions in version A and B can be found. In Table 18 the results show the number of transactions per version. All expected counts are above 5 which makes it possible to conduct a Chi-square test.

Table 18. Number of transactions version A and B

			Round 2 transaction		
			No	Yes	Total
Version	A	Count	41	147	188
		Expected count	37.5	150.5	188
	B	Count	22	106	128
		Expected count	25.5	102.5	128
Total		Count	63	253	316
		Expected count	63	253	316

Table 19 gives the results of the Chi-square. No significant result is found between the number of transactions in version A or version B of the game.

Table 19. Chi-Square test version A and B

	Chi-square value	df	Sig.
Version A and B	1.019	1	0.313

Hypothesis H2a is rejected. There are not more transactions in asymmetric information settings with known probabilities of the quality than with unknown probabilities of the quality.

There is no difference between risk and uncertainty in an asymmetric information setting. In both situations there is a similar distribution of transactions. No difference in transactions occur when there is a risk communicated towards the buyer or when there is nothing communicated about the risk towards the buyer.

H2b: A higher price will be paid per transaction in asymmetric information settings with known probabilities of the quality than with unknown probabilities of the quality.

To investigate if there is a pricing difference per transaction between version A and version B an independent t-test is conducted. In Table 20 the mean price per sold car can be found and it can be seen there are no big differences between both versions. To see if the difference is significant an independent t-test is conducted.

Table 20. Mean price per sold car per version

	Version	Mean	Std.Deviation
Low quality	A	1006	530
	B	1124	524
High quality	A	1632	338
	B	1596	350

Levene's test for equality of variances showed a non-significant result for low quality cars (F=0.060 p=8.06) and high quality cars (F=0.691 p=0.407). In Table 21 the results of the t test for assumed equal variances shows a non-significant difference between version A and B.

Table 21. Independent T-test outcome mean difference per version

	t	Df	Sig.
Low quality	-1.223	118	0.224
High quality	0.559	123	0.577

Hypothesis H2b can be rejected. There is no price difference between a transaction in an asymmetric information setting with known probabilities of the quality and a transaction with unknown probabilities of the quality.

5.3.3 Buying information

The car-game gives an option to buy information about the quality of the car in round 2. This information will reveal the quality of the car to the buyer. The advantage of the seller in an asymmetric information setting will be gone after information is bought by the buyer. Section 2.7 shows more details about the option to buy information.

There are three different prices for information used in the car-game experiment. First this Section takes a look whether there is a relation between the price of information and the amount of information bought by the buyer in the car-game. In H4a the advantage of buying information will be discussed. When a buyer buys information does this lead to more transactions? H4b investigates the price per transaction in relation to buying information is discussed.

H3: A Lower price of information will lead to more acquisition of the information.

To investigate the relation between price of information and the actual acquisition of information a crosstab is made with the amount of groups which bought information. In Table 22 the results are given. In Table 22 can be seen that all version have an expected count above 5 which makes them suiTable to investigate further. A Chi-square analyse gave a significant outcome (X(2)=21.866 p=0.000) which suggest a difference between information bought in different versions.

Table 22. Information bought in relation to price of information

			Information bought		
			No	**Yes**	**Total**
Version	0	Count	16	7	23
		Expected count	15.3	7.7	23
	50	Count	11	24	35
		Expected count	23.3	11.7	35
	200	Count	182	74	256
		Expected count	170.4	85.6	256
Total		Count	209	105	314
		Expected count	209	105	314

Difference between groups can be found by using a one-way anova test. In this test a significant outcome is found between the groups (F(2)=11.639 p =0.000) which shows a difference in mean between the groups just as seen in the Chi-square test. To see how the versions differ a Hochberg post-hoc test is used as the size of the samples are very different (Field, 2005). In Table 23 the difference between the versions can be found. When the price of information is 50 euro a significant difference between the means is given for 50 euro (M=0.69) in relation with 0 euro (M=0.3) and 200 euro (M=0.29). There is no significant difference between 0 euro and 200 euro.

Table 23. Mean differences between information price

Information price (i)	Information price (j)	Mean difference (i-j)	Std. error	Sig.
50	0	0.318	0.123	0.006
	200	0.397	0.82	0.000
200	0	-0.015	0.100	0.998

Hypothesis H3 can be rejected. A lower price of information does not lead in general to more acquisition of information. It can be seen only information with a price of 50 euro increases the amount of bought information. Compared to 200 euro a decrease in price leads to more buying of information, but compared to 0 euro no increase is measured.

H4a: More transactions will take place in asymmetric information settings where information is bought than in asymmetric information settings where no information is bought.

In previous paragraph the relation between price of information and the amount of information bought was investigated. This paragraph tests whether the buying of information leads to more transactions. A cross tabulation is shown in Table 24. All expected counts are above 5 which makes it suiTable for a chi-square analysis. Table 25 shows a non-significant relation between transactions and information bought.

Table 24. Number of transactions if information is bought or not

			Transaction		Total
			No	Yes	
Information bought	no	Count	45	164	209
		Expected count	41.9	167.1	209
	yes	Count	18	87	105
		Expected count	21.1	83.9	105
Total		Count	63	251	314
		Expected count	63	251	314

Hypothesis H4a can be rejected. There are not more transactions in asymmetric information settings where information is bought than in asymmetric information settings where no information is bought.

Table 25. Influence of information buying on transactions

	Chi-square value	df	Sig.
Information in relation to transaction	0.839	1	0.360

H4b: A lower price per transaction will be paid in asymmetric information settings where information is bought than in asymmetric information settings where no information is bought.

The price paid for a car in relation to information is researched by looking at the price per transaction in relation to the people who bought information. An independent t-test is conducted to see the mean of the price paid per car in a situation with high and low quality when information is bought or not. In Table 26 a difference in the mean can be found at low quality when information is bought (M=1169.294 versus M=788.970)

Table 26. Mean price per car when information is bought.

	Information bought	Mean	Std.Deviation
Low quality	No	1169	562
	Yes	788	291
High quality	No	1615	413
	Yes	1623	213

In Table 27 the results of the independent t-test are given. Levene's test scored a significant p<0.05 outcome with no equal variances assumed. The result of the t-test shows a significant difference in the mean at low quality. When information is bought a lower price is paid per sold car.

Table 27. Independent T-test quality difference and information bought

	t	Df	Sig.
Low quality	4.792	106.511	0.000
High quality	-0.149	111.579	0.811

Hypothesis H4b can be partly accepted. A lower price per transaction is paid in asymmetric information settings where information is bought in the case there is low quality car. Low quality car owners sell the car for a higher price when no information is bought by the buyer. They take advantage of their information. When there is a high quality car there is no significant lower price per transaction after information is bought. In a high quality car setting the buyer is more aware of the quality of the car and does not pay a higher price when there is asymmetric information.

5.3.4 Perceptions

Section 4.8 describes the theory about the perception of the seller and buyer influencing decision making in asymmetric information settings. Three different constructs are measured; risk aversion, trustworthiness and ethical behavior. This Section will analyze these three perceptions in relation to the amount of transactions. First there would be an introduction about the method used to study the hypotheses and later every perception is discussed one by one.

To investigate the relation between the perceptions and the amount of transactions a probit analysis is conducted. A probit analysis is chosen as it is a regression used with binomial response variables (Field, 2005). In this research the outcome of transactions can be yes or no and is therefore binomial. The research model shows several variables which influence the transaction. Table 28 and Table 29 show the results of the probit analysis. Table 28 shows the regression between information which is bought by players and perceptions of players, while table 29 shows a regression between the number of transactions and the perceptions of players.

H5: High risk aversion leads to fewer transactions

Two regression analyses are conducted to see the relation between risk aversion on the information bought by players (table 28) and the amount of transactions in relation to risk aversion (table 29).

Table 28 shows no significant outcome of perception on the information bought by a player. A high risk aversion did not lead to more information buying.

Table 29 shows no significant relation between risk aversion and the amount of transactions. Hypothesis H5 can be rejected as there is no significant result. Risk aversion has no significant influence on transactions.

H6: Higher trustworthiness leads to more transactions

Table 28 shows the results of the probit analysis for trustworthiness on the information bought by players. No significant difference is found between the information bought in relation to trustworthiness.

Table 29 shows the probit results between the amount of transactions and trustworthiness. A significant outcome can be found in table 29. More transactions occur if there is a higher trustworthiness.

Hypothesis H6 can be accepted. A higher trustworthiness in the seller leads to more transactions.

Table 28. Probit results of acquisition of information on perceptions

	Estimate	Std. Error	Z	Sig.
Risk aversion	-0.022	0.088	-0.254	0.799
Trustworthiness	-0.62	0.053	-1.167	0.243
Ethical behavior	-0.128	0.080	-1.610	0.107
Information check 50 euro*	0.939	0.383	2.452	0.014
Information check 200 euro**	-0.031	0.316	-0.098	0.922
Risk***	-0.485	1.015	-0.478	0.633
Risk*Trustworthiness	-0.022	0.086	-0.260	0.795
Risk*Ethical behavior	-0.055	0.136	-0.401	0.689
Risk*Risk aversion	0.113	0.151	0.750	0.453

* Reference information check 0 euro
** Reference information check 0 euro
*** Reference version A (uncertainty)

H7: Higher ethical behavior leads to more transactions

Table 29 shows no significant relation between information bought by players and ethical behavior. Ethical behavior does not influence the players to buy more information.

Table 28 shows a non-significant outcome for ethical behavior on the amount of transactions. Hypothesis H7 can be rejected. Ethical behavior of the seller has no significant influence on a transaction.

Table 29. Probit results of transactions on perceptions

	Estimate	Std. Error	Z	Sig.
Risk aversion	-0.099	0.081	-1.229	0.219
Trustworthiness	0.178	0.046	3.845	0.000
Ethical behavior	-0.013	0.073	-0.171	0.864
Car quality	-0.15	0.213	-0.071	0.943
Information check	0.317	0.259	1.220	0.222
Risk*	0.254	0.181	1.410	0.161
Information check*car quality	-0.406	0.370	-1.096	0.273

* Reference version A (uncertainty)

6. Conclusions

Economics courses at high schools are changing towards employing more classroom games during economics courses (Teulings, 2005). A new classroom game is developed by this research to make students aware of asymmetric information and test them on factors which influence their decision making in different information settings.

The classroom game is created by looking at previously developed classroom games and combining several elements used in these games resulting in a new game called "the car game". During the car game two students will negotiate on a second hand car where quality and information settings differ. The car game is optimized for the economics courses according to the guidelines of the government and will introduce students to the theory of asymmetric information.

Symmetric information versus asymmetric information
According to the literature (Kulkarni, 2000) it is easier to negotiate in a two person negotiation setting with symmetric information than in a two person negotiation situation with asymmetric information. If all information is available it is easier to reach a deal during negotiation as both parties can make rational decisions. It was therefore expected that the car game carried out in this research would show a difference between the amount of transactions in symmetric and asymmetric information markets. The results confirm this expectation: more cars were sold in the symmetric information market than in the asymmetric information market. This shows that students have more problems buying or selling a car in an asymmetric information market than in a symmetric information market. It can be concluded that information availability to all stakeholders leads to more transactions.

When one person has more information than another person (asymmetric information setting), theory states that the better informed person will take advantage of his position (Kulkarni, 2000). Hence, a higher price paid per transaction is expected in an asymmetric information market. The car game in this research revealed that this is only true for low quality cars. Students paid a significantly higher price for low quality cars in an asymmetric information setting than in a symmetric information setting. It can be concluded that the sellers of cars took advantage of their information position and used this to get a higher price for the car. However, students did not pay a higher price in asymmetric information settings when a car was of high quality. Prices in both information settings were not significantly different in the case of high quality cars. In Chapter 7 several reasons will be discussed why high quality cars did not show a significant difference in price between information settings.

Ambiguity
When knowledge is available about the probabilities of the occurrence of an event or situation, this influences the decision making of people (Tversky and Fox, 1995). People prefer decisions with known information about risk over decisions with unknown information about risk. During the car game both situations (known risk information and unknown risk information) were played by students. It was expected that more students would buy a car in the situation with known information about the risk than in the situation with unknown information about the risk.

The results of the car game did not meet the expectations as both versions did not show a difference in the number of transactions between buyer and seller. In both situations the same amount of transactions was measured. There was no difference in the amount of money paid per transaction between both versions. According to this research no influence of ambiguity was measured on the decision making in asymmetric information markets.

Information check

In asymmetric information settings one side of the market has an information advantage. The information advantage influences the decision making of people. Players of the car game are offered an opportunity to buy information about the car to overcome the information gap between buyer and seller. During the car game three versions with different prices for information (0 euro, 50 euro and 200 euro) were played. It was expected that a lower price of information will lead to more acquisition of information. Results did not show an increase in information purchase when the price of information decreases. Free information was not bought more often than the version with a price of 50 or 200 euro for information. 50 euro instead was a situation in which students bought significantly more information compared to the other 2 versions (0 euro and 200 euro). In general a lower price of information did not influence the decision to buy information.

When information is bought the asymmetric information advantage is gone. All information is available to all sides of the negotiation as the missing information is acquired. When all information is available negotiations will go easier and more transactions are expected than in a situation where no information is bought. During the car game, people who bought information did not make significantly more transactions than people who did not buy information. This research did not prove that buying information influences the number of transactions.

It was expected that people who bought information would pay a lower price per transaction than people who did not buy information. Results of the car game show this expectation is only partly true. When a low quality car buyer buys information he will pay a significantly lower price for the car than a person who did not buy information. In the high quality car setting no difference was measured between people who bought information and people who did not buy information.

Perceptions

When asymmetric decisions are made perceptions become more important during the decision process (Afzal, Roland and Al-Squri, 2009). This research investigated the role of risk aversion, ethical behavior of the seller and trustworthiness. The research showed that only trustworthiness has an influence on the decision making of buyers. More transactions occurred in asymmetric information settings when a seller scored high on trustworthiness as perceived by buyer. Both ethical behavior and risk aversion did not significantly influence the decision making during the car game.

Summary

This research showed it is easier to negotiate in a symmetric information setting than in an asymmetric information setting as more transactions occurred. During the asymmetric information setting only

trustworthiness of the seller influenced the decision making significantly. The option to buy information lead to a more realistic price paid per transaction.

7. Discussion

The car game which is created for this research is now played regularly by students at high schools in the Netherlands. Students from Wageningen University introduce the economic term asymmetric information to high school students using the car game during information lectures, called mobile practicum. The results are collected by Wageningen University for further research.

Another development took place in the presentation of the car game. The car game has been developed as a stand-alone game. Using a story board (see appendix) currently a game is created which can be played without preparation of the teacher and student. The game will contain animation movies explaining the game rules and instruction for students and teachers. The animation will guide the students throughout the whole game. A scheme of the game process is given below.

Animation about round 1 and game rules → Round 1 → Animation about round 2 → Round 2 →

→ Animation about the theory used in the game and introduction to a discussion about the game

The stand-alone game will be distributed to high schools with students in 4th and 5th grades (4 en 5 VWO). The teacher can use this game as an experiment in the classroom to introduce economics topics suitable for this game, like: asymmetric information and behavioral economics.

Classroom game
While creating a classroom game sounds easy, experience from this research shows different. Theoretical knowledge is often difficult to be translated into practice as the theoretical research is conducted in a closed environment. This research was focused on a classroom where students should be entertained by the game but the game should also be suitable for research.

During the creation of the game there was not enough time to test the classroom game. Testing the game in several settings would have revealed problems which were now noticed while measuring the game instead of during test games. Problems in length of the game and the answer sheet were found while playing the car game. Good communication with the students who organized the classroom game made it possible to adjust the game to improve the game process consequently. The answer sheet was simplified and the length of the game was shortened by reducing the number of winners from 4 to 1. In the future more attention is needed for testing classroom games before playing it.

Another problem which was faced during the game was the answer sheet. It should be very easy for the game organizer to hand out the answer sheet of the game which was used to analyze the game. 3 forms had to be filled in by students together with their group number. Several forms were missing a group number and could not be used by this research. In the future it would be wiser to put group numbers on the answer sheet before the game starts.

It can be recommended that teachers are interviewed upfront. Teachers are responsible for playing the game. The car game received positive feedback from the teachers, but some teachers had comments. It is important to talk with teachers and look for questions they want to be answered during a game.

At this moment teachers have to prepare the game before playing it with students. An improvement can be made by reducing the time it takes teacher to prepare the game. A new version of the car game will be developed were preparation time of the game by a teacher is not much.

Price per transaction

This experiment revealed fewer transactions in an asymmetric information setting than in a symmetric information setting. It was expected, next to less transactions, that a higher price would be paid per transaction. This was only true for a low quality car. High quality cars did not significantly differ in price.

Theory from Kulkarni (2000) showed people make use of their information advantage. In this research sellers took advantage of their information position. Both high quality cars and low quality cars were sold above the minimum price of a car, which confirms the information difference.

Within asymmetric information settings it is expected to have a similar price for high and low quality cars as the quality is unknown to the buyer. The buyers were smarter than expected and recognized the difference between a high and a low quality car. This could be caused by bad negotiation skills of the seller.

When negotiation started a seller of a high quality car will never accept a price below 1400 euro, this leaves no negotiation space as the buyer is aware of the minimum price of 1400 euro for a high quality car. When a price below 1400 euro is offered by a seller, this gives a signal to the buyer the seller has a bad car. This could be an explanation why bad negotiations of sellers reveal their quality during negotiations. The best strategy for sellers in negotiation would be to never drop the price below the price of the high quality car. When a seller uses this strategy a buyer can never see, during negotiations, what kind of quality car the seller has.

The lemons market described by Akerlof (1970) shows a continuing decrease in price of second hand cars as high quality cars will not be sold any more. This research shows a beginning of a lemons market. When the game would be extended with more rounds, low quality car buyers will not pay a high price anymore per car as they lost an average of 500 euro per car. They will pay a low price per car. High quality car owners can pay a high price, but when chances will be 50-50 having a good or bad car, half of the buyers will get a low quality car in the next round. These people will pay too much for the car and end up with a similar outcome as a low quality car buyer in round one. When this experiment is repeating several rounds, it is expected nobody will pay a high price for a high quality car anymore and only low quality cars will be sold on the market. Exactly what Akerlof expected with the market for Lemons.

Ambiguity

It was expected people would prefer risk over uncertainty. This research was one of the first in literature which investigates the relation between ambiguity and asymmetric information. No difference was measured between both situations in number of transactions and price paid per transaction, which makes it not in line with the hypotheses H2a and H2b.

The experiment included both high quality and low quality cars. The Ellsberg experiment on ambiguity was conducted under controlled conditions. This game was conducted in a classroom where

students could see in round 1 and in round 2 what happened. It is possible students were biased in round 1 and found out they had a 50-50 chance of receiving a high or low quality car.

A different explanation can be found in the situation people are in. Players of the car game are already in an uncertain situation as the other player during the negotiation has more information. The impact of ambiguity can change when the information situation changes. If there is an asymmetric information setting it could be possible other factors become more important than ambiguity as it is already an uncertain situation. Future research should investigate if this is true and if there is a ranking of factors. This ranking can result in a better view on the role of ambiguity in asymmetric information settings.

Information Check

It was expected people would buy more information if the price of information would decrease. During the research a lower price for information did not lead to more acquisition of information as the information priced at 0 euro did not receive more buyers than the 50 euro price option. Instead of a price of 50 euro had more people buying information than in the 0 euro version.

The data used in this research are unequally distributed. The 0 euro version was only played 23 times and the 50 euro version was only played 35 times, compared to 259 games played in the 200 euro version. It can be possible when this test is repeated by more people the relations will differ as not all situations are played the same amount of times. It is suggested to repeat the experiment and get more results from the 0 and 50 euro versions and look at the hypotheses again.

A possible reason why 0 euro was less bought than the 50 euro version can be found in trust towards information. It could be an option people trust paid information more than they trust free information. When free information is available the trust in this information could be lower. People will neglect this free information. When there is a price tag to information people intent to take it more serious and find it more reliable. Trust in free information is low so people do not make use of it. More research is needed to investigate the relation between paid and free information.

Information and transactions

People who bought information did not have more transactions, even though all information was available after the information was bought. The difference between transactions in a symmetric and asymmetric market is only 10% (Section 5.3.1). It could be possible this difference is not significant enough on the smaller dataset used for this experiment. In the research an increase of 7% is measured between the amount of transactions when information is bought and when the information is not bought. This number is not significant at this moment as an increase of 7% on 105 samples is not significant. When compared to 10% on 365 samples in the H1a this could be significant as well when the experiment is repeated.

It could also be possible that during the game players do not know what to do after information is bought. Within the car game it is possible to negotiate further when information is bought. The game does not stop at the moment information is bought. This game rule was not always clear and could affect the amount of transactions after buying information.

Information and price per transaction

When information is bought, it was expected the price per transaction will decrease. Information about the quality of the car is revealed and a price for the car can be seen. By showing all information it should be easier to reach a deal, which is more in line with the actual price of the car. During the car game there was only an effect measured at the low quality cars. The prices of low quality cars went down an average 400 euro per transaction, which is a difference of 30%. This is in line with the theory which expected a lower price due to more information.

The high quality car did not change in price. It is quite strange to see no change in pricing for high quality cars. People who bought information still paid a higher price for a car (1623 euro) than the car was worth (1400 euro).

This can be caused by bad negotiation skills of the buyer. A buyer is aware of the price of the car 1400 euro but still takes the car for 1623 euro. This is a loss of 223 euro, it could be possible students did buy a car because they wanted to have a transaction. Players with no transaction had no chance to win the game.

Another reason can be found in real life behavior and in game behavior. During the car game people play with fictive money. When they play with real money they could be more into getting a better deal and be more aware of the price difference.

Perceptions

Perceptions in this game are measured with three questions. The reliability of ethical behavior and risk aversion measured were not high (α=0.74 and α=0.58). These questions could be extended with additional question used in the full scales to measure ethical behavior and risk aversion. A short questionnaire was chosen because of the time it takes to fill in a long questionnaire. When more time is available a better questionnaire can be made, to measure more accurately the perceptions risk aversion and ethical behavior. Using the scores of this research, both ethical behavior and risk aversion were not in line with the expectations of the hypotheses.

Several factors can influence the perceptions. First of all the simulation game perceptions are different from perceptions in real life. In real life it is possible that risk averse is more dominant. When playing with own money it is harder to spend the money than the money from the game. Also ethical behavior is easier to provoke in simulation games. During the games making fun of your classmate is a trigger for people, by offering them a low quality car for a high price. Normally these players will not cheat, but due to the game and circumstances it could be possible they did cheat.

Practical relevance

This research measured factors which influence young people in their decision making in asymmetric information settings. It can be seen that trustworthiness is an important factor which influences the amount of transactions. Using this information can result in a more trustful look in stores where information gaps are found between young people and another agent. Young people will buy more.

More transactions were measured in situations where all information was available. In practice this can be seen as a transparent sales process. When information is shared more transactions will

occur, but the average price per deal goes down. In this case an agent has to think what is more important; short term or long term. When short term money is needed, do not give all information but look very trustful. When long term money is needed, give information about the product and be honest.

When offering information, it can be an option to offer paid information. Although this needs more investigation, it could be helpful to attract more deals by letting customers pay for "secret" information.

Limitations and future research

The car game is played as a classroom game. High school classes in the Netherlands are often very familiar with each other. They are already together in the same class for a long time and know each other pretty good. This will affect the car game as it is a game based on trust. People in the same class can trust each other better than strangers. It is recommended in future research to play this game also with strangers who don't know each other. It could be interesting to see if there is a difference between a class and total strangers.

A simulation game remains a game. People do not play with their own money, so the question remains if people make similar decisions in real life? This will be a remark on classroom games which are analyzed for scientific research.

An option will be to play the car game with more quality cars. Now only 2 cars were investigated and asymmetric information was not visible for high quality cars. When creating a game with 5 different quality cars, information becomes even more important as there are more choices to be made.

In the future it is possible to create more rounds per game. With more rounds it will be easier to look at relationships and a market which is establishing. Within 5 rounds it would be possible to create a market for lemons inside the game and let student see what asymmetric information can do. An addition to the car game can be made to create a more complex game which will take more time, but will also explain more theory.

More research is needed to investigate the relation between paid and free information. It would be interesting to see if paid information is really trusted more than free information. This could be done by repeating the experiment with different prices for information and see if there is a pattern between paid and free information. At what price for example does information get trusted?

The data created by this research can be studied for more features. This research for example did not study gender differences. It would be an interesting study to see how negotiations between men-men and women-women differ from each other, also when negotiations between genders is played. It could be interesting to see if there are differences between genders. Another feature could be the region where the school is located. Does the region of the school affect the car game result? The dataset can be used for further research.

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Appendix

Appendix A: Car Game script and instructions

Inleiding voor de studenten (ter voorbereiding)

Dit experiment sluit qua economisch onderwerp sterk aan bij asymmetrische informatievoorziening en gedragseconomie. De uitkomsten van het spel worden gebruikt in een wetenschappelijk onderzoek. Bestudeer de uitleg hieronder grondig zodat je de situatie en het spel snapt. Het is de bedoeling dat je de situatie zelf kunt uitleggen aan de leerlingen. Bekijk goed de sheets die bij dit experiment horen.

In dit experiment staat asymmetrische informatie centraal. Dit houdt in dat een persoon (dit spel de verkoper) meer informatie heeft over het product dan de andere persoon (dit spel de koper). Door het verschil in informatie is het moeilijker onderhandelen en zal er een risico- factor aanwezig zijn. Tijdens het experiment willen we het verschil laten zien tussen een onderhandeling met symmetrische informatie en een met asymmetrische informatie. De traditionele economie gaat vaak uit van een situatie met symmetrische informatie, waar beide personen over de gelijke informatie beschikken. Via dit experiment maken zij ook kennis met gedragseconomie waarbij er speciale aandacht voor gedragsfactoren is.

Doelstelling

De doelstelling van de proef is de leerlingen kennis te laten maken met het verschil in informatievoorziening bij economische aankopen en een introductie te geven van gedragseconomie. Het experiment moet duidelijk maken wat asymmetrische informatie inhoudt; de leerlingen kunnen soortgelijke situaties in hun eigen omgeving herkennen.

De leerlingen gaan in tweetallen twee rondes van 5 minuten onderhandelen in tweedehands auto's. In de twee rondes word de informatievoorziening veranderd. Hierdoor heb je in de eerste ronde symmetrische informatie en in de tweede ronde asymmetrische informatie.

Er zijn in het spel 2 typen auto's. Een goede kwaliteit auto en een slechte kwaliteit auto. Dit geeft een incentive voor beide partijen om goed te onderhandelen.

De persoon die het beste onderhandelingsresultaat bereikt wint het spel.

Benodigdheden (bijgevoegd in draaiboek, lees deze door voordat je verder leest)

  a. Ronde 1 formulier verkoper 20x
  b. Ronde 1 formulier koper 20x
  c. Ronde 2 formulier verkoper 20x
  d. Ronde 2 formulier koper 20x
  e. Kwaliteit auto, goede kwaliteit 10x
  f. Kwaliteit auto, slechte kwaliteit 10x
  g. Antwoordformulieren 20x

Uitvoering van het experiment

1. Deel de klas willekeurig in tweetallen in. (Bij een oneven aantal leerlingen doet een student niet mee of doet de docent ook mee). Wijs in elke groep een koper en verkoper aan en geef elke groep een ander nummer (dit is hun groepsnummer). Laat deze mensen naast of tegenover elkaar zitten zodat ze straks makkelijk kunnen onderhandelen. Het beste kun je mensen achter elkaar aanwijzen om samen te werken in plaats van mensen die naast elkaar zitten.

2. Deel de formulieren van ronde 1 uit aan elke groep en laat ze zelf kiezen wie de verkoper en koper is in beide ronde. Deel naast de spelformulieren ook per koppel 1 antwoordformulier uit en geef deze aan de koper.

3. Deel vervolgens de kwaliteit-auto-kaartjes uit en leg deze tussen de verkoper en koper in. Beide personen mogen dit kaartje inzien. Start het experiment.

4. Na 5 minuten stopt de onderhandeling.

5. Haal de formulieren van ronde 1 op. Vraag in de tussentijd de verkoper en koper hun vragenlijst in te vullen op het antwoordformulier.

6. Geef uitleg over ronde 2.

7. Deel de formulieren van ronde 2 uit aan elk tweetal. Deel het formulier over de kwaliteit van de auto **alleen uit aan de verkoper**. Start vervolgens ronde 2.

8. Na 5 minuten stoppen de onderhandelingen van ronde 2.

9. Start discussie over informatievoorziening en gedragseconomie.

Keuring: In ronde 2 is het mogelijk voor studenten om een keuring aan te vragen. Het is voor de koper mogelijk om een onafhankelijke keuring te laten uitvoeren op de auto. Bij een akkoord moet de verkoper de kaart met kwaliteit laten zien aan de koper. Let op dit kost geld! De keuringsdienst wil geld, maar het maakt hem niet uit hoe en wie van de twee dit betaalt. Als de auto word gekeurd, moeten de verkoper en koper hier samen uitkomen wie de kosten van de keuring betaalt.

Spel: Tijdens het spel is het mogelijk om allerlei argumenten te gebruiken. Ze moeten zelf bekijken hoe ze het beste de auto verkopen. Het enige wat duidelijk is, is de minimale waarde van de auto die 1400 of 500 bedraagt.

| Versie keuze | Maak een keuze welke versie je speelt, A of B en 0 – 50 – 200 euro. Pas dit aan op de powerpoint! |

| Uitleg ronde 1 | Geef instructies over ronde 1, alle informatie is in deze ronde open en toegankelijk voor iedereen. Deel ook de klas in tweetallen in en geef ze een groepsnummer (in te vullen op het antwoordformulier). |

| Start ronde 1 | Start het spel gedurende 5 minuten. |

| Antwoorden invullen ronde 1 | Geef de klas de tijd om de antwoorden van Ronde 1 in te vullen. Laat ze ook de vragenlijst op het antwoordformulier invullen. |

| Uitleg ronde 2 | Geef instructies over ronde 2, let hierbij op de versie keuze met betrekking tot de keuringskosten! |

| Start ronde 2 | Start het spel gedurende 5 minuten |

| Antwoorden invullen ronde 2 | Geef de klas de tijd om het antwoordformulier in te vullen |

| Verkiezing winnaar | De winnaar van het spel word verkozen aan de hand van de rekensom in de powerpoint en uitleg in draaiboek. |

| Uitleg theorie | Leg de theorie uit aan de hand van het spel. |

Verkiezing winnaar

Er wordt 1 winnaar gekozen bij dit spel. Dit geldt alleen voor mensen die een contract hebben getekend. De mensen zonder contract hebben helaas verloren.

De berekening voor de winnaar is lastig dus let op:

Op de slide staat een rekensom voor zowel de koper als voor de verkoper. Eerst behandelen we de rekensom van de koper daarna die van de verkoper.

Koper: De koper begint met een bedrag van 2000 euro, trek hier het bedrag waarvoor de speler de auto heeft gekocht af. Als de speler een keuring heeft gebruikt en de speler heeft hier iets of alles aan betaald, trek dit ook af van het totaal bedrag. Tel daarna de minimale waarde van de auto op.

Dus de rekensom word: Startbedrag – Verkoopprijs – keuringskosten + waarde van de auto.

Bijvoorbeeld: De koper heeft 1500 euro betaald voor een auto en de minimale waarde van de auto was 1400. De koper heeft voor 100 euro meegedeeld in de kosten van de keuring. De berekening wordt dan 2000 – 1500 – 100 + 1400 = 1800 euro

Mocht er geen transactie zijn geweest maar wel een contract. Laat dan de verkoopprijs en waarde van de auto buiten beschouwing en laat alleen de keuringskosten meespelen.

Verkoper: De verkoper heeft het makkelijker, deze kan het totale bedrag wat hij heeft ontvangen (verkoopprijs) minus de keuringskosten die hij heeft betaald neerzetten.

De rekensom word: Verkoopprijs - keuringskosten

Bijvoorbeeld: De verkoper heeft 1500 euro gekregen en 100 euro meegedeeld in de kosten van de keuring. De verkoper heeft een resultaat van 1500-100 = 1400 euro

Mocht er geen transactie zijn geweest maar wel een contract. Dan krijg je in plaats van de verkoopprijs de minimale waarde van de auto. De rekensom wordt dan: minimale waarde van de auto - keuringskosten

Nu komt de verkiezing van de winnaar. Dit is het bedrag dat zowel de verkoper als de koper over houdt. Diegene met het hoogste bedrag wint.

Dit kan eenvoudig door te vragen en handen omlaag te doen, wie heeft er een totaal bedrag van 1500, van 1600 oplopend tot er een winnaar is.

Zijn er twee of meerdere mensen met hetzelfde antwoord. Verloot dan de prijs onder de winnaars.

Spel Versies

Er zijn twee versies van het spel. Een versie A en een versie B. (Te zien aan ronde 2A of ronde 2B) Zorg dat je per klas versie A of versie B hebt.

Daarnaast zijn er 3 verschillende keuringskosten, 0 euro, 50 euro en 200 euro. Dit moet net zoals versie A en B willekeurig verdeeld worden. Let op! De papieren versie geeft alleen 200 euro weer. De 50 euro en 0 euro versie zijn actiekortingen. Van te voren bepaalt de spelleider welke versie gespeeld word. Voor het begin van ronde 2 word aangegeven welke prijs de keuring heeft. De prijs van de keuring wordt bekend gemaakt via de powerpoint bijgevoegd. Hierop geef je aan als de prijs van de keuring minder dan 200 euro is.

Onderstaand schema kun je gebruiken om te bekijken of je elk spel evenveel gespeeld hebt.

	A	B
0 euro		
50 euro		
200 euro		

Theorie:

Tijdens het verkopen van auto's hebben we twee verschillende situaties gezien. In de eerste situatie was alles over de auto bekend en in de tweede ronde had alleen de verkoper toegang tot de informatie over de auto. Wel kon deze informatie aangekocht worden waardoor beide personen weer dezelfde informatie zouden hebben.

Dit spel wil duidelijk maken wat de rol van informatie is in de economie en waarom mensen niet altijd rationele beslissingen nemen. We beginnen eerst met de informatie verdeling en komen dan terug op de gedragseconomie

Asymmetrische informatie

Bij asymmetrische informatie staat de rol van informatie tijdens economische beslissingen centraal. Zoals we in het spel hebben kunnen zien, is in ronde 1 bij beide partijen duidelijk wat de kwaliteit en prijs van de auto was. In ronde twee wist alleen de verkoper de kwaliteit van de auto. De verkoper had een duidelijk voordeel in de tweede ronde aangezien hij alle informatie had. Hij kon hier over liegen, zonder dat de koper hier iets van merkte. Deze wist niet wat de kwaliteit van de auto was.

Het voordeel van meer of betere informatie leidt tot een asymmetrische verhouding. In een asymmetrische informatie setting is er een partij met meer informatie dan de andere en kan daardoor een voordeel behalen.

Andere voorbeelden waar het hebben van informatie invloed kan hebben op beslissingen zijn onder andere:

Een persoon die een verzekering afneemt (verzekeringsnemer) maar erg veel rookt, kan invullen dat hij niet rookt, zonder dat de verzekering dit weet. De verzekeraar heeft namelijk minder informatie over de verzekeringsnemer dan de verzekeringsnemer zelf.

Het kopen van een ingewikkelde verzekering. Eigenlijk weet je niet wat je koopt, de andere partij heeft meer informatie en kennis van het product, toch vertrouw je snel een persoon die jou zoiets verkoopt.

Iemand die in het bestuur zit van een groot bedrijf heeft kennis en informatie over het bedrijf. Veel meer informatie dan een belegger die niks van het bedrijf weet. Hierdoor zou de bestuurder makkelijk beslissingen kunnen nemen wanneer hij een aandeel moet kopen of niet van zijn eigen bedrijf. (Dit is daardoor ook bij wet verboden omdat er misbruik van gemaakt kan worden)

De rol van informatie wordt steeds belangrijker bij economische beslissingen. Gaan traditionele economische theorieën ervan uit dat alle informatie volledig en beschikbaar is, de information economics bestudeert de situaties waar deze net even anders zijn. Tijdens dit spel hebben jullie gezien wat de rol van asymmetrische informatie is doordat een persoon meer informatie had dan de andere partij.

Hoe zouden jullie asymmetrische informatie tegen gaan?

Hebben jullie voorbeelden waarbij een persoon meer informatie heeft dan een andere partij?

Gedragseconomie

De traditionele economie gaat uit van rationaliteit. Beslissingen worden genomen door het maken van een rationele analyse. Bijvoorbeeld middels de analyze van vraag en aanbod. Als we kijken hoeveel vraag er is en hoeveel aanbod, kan de ideale prijs berekend worden. In de realiteit is het echter niet zo makkelijk om rationele afwegingen te maken. Dit laten wij zien aan de hand van het spel. Er zijn veel meer factoren die meespelen als je beslissingen neemt.

In dit spel kon je extra informatie kopen. Als je veel geld uit gaat geven is het logisch als je alles weet van het product. Hoeveel mensen hebben eigenlijk niet een keuring aangevraagd maar wel een deal gesloten? Best veel? Terwijl je niet wist wat de kwaliteit van de auto was.

Deze mensen hebben erop vertrouwd dat de verkoper eerlijk was over zijn auto, terwijl er geen rationele basis tegenover staat. Je hebt minder kennis van het product en weet niet wat de kwaliteit van de auto was. Je weet dus niet of hij de waarheid verteld of dat hij je zit voor te liegen. Toch word er door deze mensen een deal gemaakt maar niet gekeurd of de auto van de kwaliteit is die de verkoper voorstelde.

Deze beslissing kan op veel verschillende aspecten rusten, je zou iemand bijvoorbeeld al kunnen kennen en vertrouwen waardoor je niet twijfelt aan een beslissing, de reputatie zou erg goed kunnen zijn waardoor je iemand vertrouwd, of je hebt andere redenen waarom je de auto toch koopt.

Uit deze beslissingen blijkt dat gedrag invloed heeft op het maken van keuzes en keuzes niet altijd rationeel gemaakt worden op basis van volledige informatie. Dit word bestudeerd in de gedragseconomie. Hierin staat centraal waarom economische beslissingen genomen worden vanuit het gedrag en psychologie van de mens.

Vragen voor de discussie na de game

Waarom heb jij in ronde 2 geen keuring gebruikt?

Antwoord: verschillende aspecten die mee speelden, gedragseconomie.

Welke ronde vond je moeilijker om te spelen? Ronde 1 of ronde 2? Waarom vond je dit moeilijker?

Antwoord: Ronde 2, want daar had ik niet de informatie over de auto die ik in ronde 1 had.

Wie heeft er een keuring gebruikt in ronde 2? Waarom wel, waarom niet?

Antwoord: Rationeel gezien heb je geen informatie over de auto. Je maakt dus een gok of de andere persoon liegt of niet. Je vertrouwd hem of hebt andere redenen waarom je diegene niet controleert. Rationeel gezien zou je iemand die jou iets aanbiedt, maar je niet weet wat voor kwaliteit het heeft meestal controleren.

Weten jullie andere situaties waarbij asymmetrische informatie voorkomt?

Antwoord: Bij een verzekering, waarbij de verzekering niet weet of de verzekeringsnemer de juiste informatie invult, bv rook je veel?

Bij tweedehands aankopen op internet, je hebt het product nooit gezien.

Bij onderhandelingen waar 1 persoon meer verstand heeft van de inhoud dan de ander.

Bij een dokter waar jij niet weet of hij de juiste diagnose stelt, want je hebt er niet veel verstand van.

Ofwel er komen in heel veel situaties voor waarbij je niet een rationele afweging kan maken omdat je niet beschikt over alle informatie. Op dat moment worden andere factoren belangrijk. Dit zouden bijvoorbeeld vertrouwen, risico vermijdend gedrag of andere factoren kunnen zijn.

Instructie koper – Ronde 1

Je onderhandelt over de aankoop van een tweedehands auto.

De waarde van dit type auto is minimaal 1400 euro als deze in goede staat verkeert. Mocht de auto een technisch probleem hebben, dan is de waarde van de auto minimaal 500 euro, wat gelijk staat aan de sloopwaarde.

Op het kaartje dat jullie krijgen kun je zien wat de kwaliteit van de auto is op dit moment.

Je hebt een budget van 2000 euro. Het bedrag dat je overhoudt plus de minimale waarde van de auto, indien gekocht, is je uitkomst. De koper/ verkoper met de hoogste uitkomst, wint het spel.

Jullie hebben 5 minuten om te onderhandelen.

Instructie koper – Ronde 2A

Dit is een nieuwe ronde met een andere auto. De auto van vorige ronde heeft niets te maken met deze ronde.

Je onderhandelt over de aankoop van een tweedehands auto.

De waarde van dit type auto is minimaal 1400 euro als deze in goede staat verkeert. Mocht de auto een technisch probleem hebben, dan is de waarde van de auto minimaal 500 euro, wat gelijk staat aan de sloopwaarde.

Het is mogelijk om de auto te laten controleren door een onafhankelijk bedrijf voor de aankoop van de auto. Hierdoor kom je te weten of de auto goed of slecht is doordat de verkoper zijn kaartje moet laten zien. De kosten hiervan bedragen 200 euro. Er zijn geen regels wie dit betaalt. Als je gebruik maakt van de keuring, moet je de betaling samen met de verkoper oplossen.

Je hoeft de auto natuurlijk niet te laten keuren voor 200 euro. Dan bespaar je de kosten van de keuring.

Je hebt een budget van 2000 euro. Het bedrag dat je overhoudt plus de minimale waarde van de auto is je uitkomst. De koper/ verkoper met de hoogste uitkomst, wint het spel.

Jullie hebben 5 minuten om te onderhandelen.

Instructie koper – Ronde 2B

Dit is een nieuwe ronde met een andere auto. De auto van vorige ronde heeft niets te maken met deze ronde.

Je onderhandelt over de aankoop van een tweedehands auto.

De waarde van dit type auto is minimaal 1400 euro als deze in goede staat verkeert. Mocht de auto een technisch probleem hebben, dan is de waarde van de auto minimaal 500 euro, wat gelijk staat aan de sloopwaarde.

Het is mogelijk om de auto te laten controleren door een onafhankelijk bedrijf voor de aankoop van de auto. Hierdoor kom je te weten of de auto goed of slecht is doordat de verkoper zijn kaartje moet laten zien. De kosten hiervan bedragen 200 euro. Er zijn geen regels wie dit betaalt. Als je gebruik maakt van de keuring, moet je de betaling samen met de verkoper oplossen.

Je hoeft de auto natuurlijk niet te laten keuren voor 200 euro. Dan bespaar je de kosten van de keuring.

De kans dat de verkoper een goede of slechte auto verkoopt is even groot.

Je hebt een budget van 2000 euro. Het bedrag dat je overhoudt plus de minimale waarde van de auto is je uitkomst. De koper/ verkoper met de hoogste uitkomst, wint het spel.

Jullie hebben 5 minuten om te onderhandelen.

Verkoper – Ronde 1

Je onderhandelt over de verkoop van een tweede hands auto.

De waarde van dit type auto is minimaal 1400 euro als deze in goede staat verkeert. Mocht de auto een technisch probleem hebben, dan is de waarde van de auto minimaal 500 euro, wat gelijk staat aan de sloopwaarde.

Kijk op het kaartje wat voor auto jij hebt en wat de kwaliteit is. **Laat dit ook zien aan de koper.**

De koper/ verkoper met de hoogste uitkomst, wint het spel. Bij geen verkoop krijg je de minimale waarde van de auto als uitkomst.

Jullie hebben 5 minuten om te onderhandelen.

Verkoper – Ronde 2

Dit is een nieuwe ronde met een andere auto. De auto van vorige ronde heeft niets te maken met deze ronde.

Je onderhandelt over de verkoop van een tweede hands auto.

De waarde van dit type auto is minimaal 1400 euro als deze in goede staat verkeert. Mocht de auto een technisch probleem hebben, dan is de waarde van de auto minimaal 500 euro, wat gelijk staat aan de sloopwaarde.

Kijk op het kaartje wat voor auto jij hebt en hoeveel deze waard is. Laat het kaartje **NIET** zien aan de koper.

Het is voor de koper mogelijk om de auto te laten controleren door een onafhankelijk bedrijf voor de aankoop van de auto. Hierdoor komt de koper te weten of de auto goed of slecht is doordat de verkoper zijn kaartje moet laten zien. De kosten hiervan bedragen 200 euro. Er zijn geen regels wie dit betaalt. Als de koper gebruik maakt van de keuring, moet je de betaling samen met de verkoper oplossen.

Je hoeft de auto natuurlijk niet te keuren voor 200 euro. Dan bespaar je de kosten van de keuring.

De verkoper die het meeste geld overhoudt onder de verkopers, wint het spel. Bij geen verkoop krijg je de minimale waarde van de auto als uitkomst.

Jullie hebben 5 minuten om te onderhandelen.

Antwoordformulier

Datum   ....   Groepsnummer   ....

Keuringskosten   €....

Ronde 1	Kwaliteit Auto		Akkoord		Verkoop-prijs auto	
	Hoog/laag		Ja/Nee		€……..	
Ronde 2	Kwaliteit Auto	Contract	Akkoord	Keuring gebruikt	Verkoop-prijs auto	Versie
	Hoog/laag	Ja/Nee	Ja/Nee	Ja*/Nee	€…..	A / B

*Keuring betaald door:	Koper €….
	Verkoper €….

Toelichting	
Kwaliteit auto:	Geef hier aan welke kwaliteit auto er op het kaartje stond.
Contract:	Hebben jullie een overeenkomst gesloten? (Jullie zijn het eens om een keuring te laten uitvoeren of jullie zijn het eens om de auto te verkopen). Als er een onderhandelingsakkoord is, is er een contract. Een contract hoeft niet per se te leiden tot de verkoop van de auto.
Akkoord:	Is de auto inderdaad van verkoper naar koper gegaan?
Keuring gebruikt:	Hebben jullie gebruik gemaakt van de keuring?
Verkoopprijs auto:	De verkoopprijs van de auto.

In te vullen door de <u>Verkoper   (koper zie achterkant)</u>

                                                      Geslacht verkoper

Geef aan in welke mate je het eens bent met onderstaande stellingen.   O Man
(Kruis telkens het rondje aan dat het meest van toepassing is)   O Vrouw

Het is voor een verkoper acceptabel dat deze:

     Alleen geïnteresseerd is in eigen winst, niet in de klanten.
         oneens   O   O   O   O   O   O   O   eens

     De goede punten van het product overdrijft.
         oneens   O   O   O   O   O   O   O   eens

     Onjuiste productinformatie geeft.
         oneens   O   O   O   O   O   O   O   eens

Vragenlijst (in te vullen door koper)

Geef aan in welke mate je het eens bent met onderstaande stellingen
(Kruis telkens het rondje aan dat het meest van toepassing is)

Geslacht koper

O Man
O Vrouw

De verkoper geeft mij een gevoel van vertrouwen

oneens　　O　　O　　O　　O　　O　　O　　O　　eens

Ik heb vertrouwen in de verkoper.

oneens　　O　　O　　O　　O　　O　　O　　O　　eens

De verkoper maakt een betrouwbare indruk op mij

oneens　　O　　O　　O　　O　　O　　O　　O　　eens

Ik wil zeker zijn van mijn zaak voordat ik iets koop

oneens　　O　　O　　O　　O　　O　　O　　O　　eens

Ik vermijd riskante zaken

oneens　　O　　O　　O　　O　　O　　O　　O　　eens

Ik neem liever het zekere voor het onzekere

oneens　　O　　O　　O　　O　　O　　O　　O　　eens

Kwaliteit auto

De auto is in goede staat, er zijn geen mankementen.
Van de buitenkant ziet hij er mooi uit.

Kwaliteit auto

De auto ziet er van buiten goed uit. Er zijn geen defecten zichtbaar,
intern is er van alles mis. Er lekt olie en de accu is niet
helemaal goed meer. De auto heeft een technisch probleem.

Appendix C: Storyboard Car Game

1. Animatie voor start

Doel: Indeling klas in tweetallen, Uitdelen juiste formulieren, Uitleg spel

- De komende 20 minuten gaan we onderhandelen in tweedehands auto's

- De resultaten worden gebruikt voor wetenschappelijk onderzoek, zouden jullie de formulieren daarom serieus willen invullen.

- Tijdens dit experiment willen wij jullie kennis laten maken met verschillende economische begrippen. Deze zullen na afloop aan jullie uitgelegd worden.

Maar voordat we gaan beginnen eerst even wat informatie over hoe het spel gespeeld word. Let goed op! En kijk ook of je alle formulieren op je tafel hebt liggen.

- Als eerste delen we de klas in tweetallen in,

Per tweetal wordt 1 persoon de koper van een auto en 1 persoon de verkoper van een auto.

- We spelen twee ronden, ondertussen wordt er gevraagd om wat formulieren in te vullen,

- Jullie krijgen allebei afzonderlijk als verkoper en koper een instructiekaart, laat deze niet aan elkaar zien! Hierop staan de instructies van het spel voor jou als verkoper of koper.

- Tijdens beide ronde krijgen jullie een tweedehands auto. Dit is een los kaartje dat word uitgedeeld.

- Er bestaan 2 soorten auto's, een goede kwaliteit auto en een slechte kwaliteit auto. Tijdens de eerste ronde wordt het kaartje van de auto in het midden van de verkoper en koper gelegd en kunnen jullie allebei bekijken wat voor soort auto het is.

- Als laatste krijgen jullie een antwoordwoord formulier, hierop kunnen jullie de antwoorden noteren, maar daar vertel ik meer over voordat ronde 2 begint!

- Dan kijken we nog 1 keer of alles op tafel ligt, Een formulier ronde 1 voor de koper (Check) een formulier ronde 1 voor de verkoper (check) een kaartje met de auto (check) en een antwoordformulier (Check)

- Mooi. Dan is het nu aan jullie om te gaan onderhandelen. De komende 5 minuten krijgen jullie de tijd om te kijken of de auto van verkoper over kan gaan naar de koper en voor hoeveel geld dit gebeurd. Succes met onderhandelen.

2. Ronde 1 van het spel spelen

Timer op het scherm aftellen vanaf 5 naar 0?

3. Animatie 2 uitleg ronde 2

Doel: Invullen antwoordformulier, Uitleg ronde 2

- En is het gelukt? Heeft iedereen zijn auto verkocht? Ik ben wel benieuwd voor welke prijs jullie de auto hebben verkocht! Daarom wil ik jullie vragen om het antwoord formulier in te vullen.

- Voorbeeld van het antwoordformulier,

- Oke op jullie instructiekaart konden jullie al zien hoeveel geld je overhoudt. Voor de koper is dit als volgt,

De waarde van de auto, dit staat aangegeven op het kaartje van de auto achter minimale waarde van de auto.

Je begon als koper met 2000 euro, trek hier het bedrag waarvoor je de auto hebt gekocht af. Tel daarbij de waarde van de auto op. Bijvoorbeeld, Je hebt 1500 euro betaald en de waarde van de auto was 1400. Dan heb je 2000 – 1500 = 500 + 1400 = 1900 euro.

De verkoper heeft het wat makkelijker, deze telt het bedrag wat hij gekregen heeft voor de auto.

- Bij geen deal heeft de verkoper de waarde van de auto en houdt de koper 2000 euro over.

- Oke nu gaan we nog een keer een ronde spelen. Jullie behouden dezelfde rol als koper of verkoper.

- Jullie hebben nu allebei een nieuw instructiekaart voor je. Hier staat ronde 2 boven! Laat deze instructies wederom niet zien aan de andere persoon.

- Jullie krijgen een nieuwe auto waarover jullie gaan onderhandelen, Echter is er een verschil. In deze ronde mag alleen de verkoper zien wat er op het kaartje van de auto staat. Laat dit kaartje ook niet zien aan de koper!

- Zoals je gaat zien zijn er wat veranderingen, het is voor de koper mogelijk om een onafhankelijke keuring te laten uitvoeren op de auto. **Let op dit kost geld**! De keuringsdienst wil geld, maar het maakt hem niet uit hoe en wie van de twee dit betaald. Als jullie de auto willen laten keuren, moeten jullie er samen uitkomen wie dit betaald.

- Je hoeft de auto natuurlijk niet te laten keuren, dat scheelt geld.

- Volgens mij is alles duidelijk, laten we dan nog 1 keer kijken of alles op tafel ligt, Een formulier ronde 2 voor de koper (Check) een formulier ronde 2 voor de verkoper (check) een kaartje met de auto alleen in de handen van de verkoper(check) en het antwoordformulier (Check)

- Mooi! Dan kunnen we nu ronde 2 gaan spelen. Ook in deze ronde krijgen jullie 5 minuten de tijd om te onderhandelen. Succes!

4. Ronde 2 van het spel spelen

Misschien wederom een timer?

5. Animatie einde, uitleg.

Doel: Uitleg antwoordformulier, Kiezen winnaar, Uitleg theorie, Discussie opstarten

- En is het wederom gelukt om de auto te verkopen of te kopen?

- Zullen we opnieuw kijken of we het antwoordformulier in kunnen vullen,

- Je hebt verschillende kolommen.

Als eerste beginnen we bij de kolom contract. Deze geeft aan of jullie een contract hebben, is de auto gekeurd, is de auto gewisseld van eigenaar, eigenlijk als er een overeenkomst over iets is dan vul je hier in dat je een contract had. Dit kan dus ook zijn dat je een keuring hebt gebruikt, maar uiteindelijk niet de auto hebt gekocht!

De tweede kolom is akkoord. Hierin geef je aan of de auto van eigenaar is gewisseld of niet. Is hij verkocht of niet.

De kolom keuring, geeft aan of je de keuring hebt gebruikt of niet.

Dan de uitkomst van de onderhandeling, let op want het is even wat rekenwerk.

- De waarde van de auto, dit staat aangegeven op het kaartje van de auto achter minimale waarde van de auto.

- Je begon als koper met 2000 euro, trek hier het bedrag waarvoor je de auto hebt gekocht af. Als je een keuring hebt gebruikt en je hebt hier iets of alles aan betaald trek dit ook af van het bedrag. Tel daarna de waarde van de auto op. Bijvoorbeeld, Je hebt 1500 euro betaald en de waarde van de auto was 1400 en je hebt voor 100 euro meegedeeld in de kosten van de keuring. Dan heb je $2000 - 1500 = 500 + 1400 = 1900 - 100 = 1800$ euro.

- De verkoper heeft het wederom makkelijker, deze kan het totale bedrag wat hij heeft ontvangen minus de keuringskosten die hij heeft betaald neerzetten. Heeft hij 1500 euro gekregen en 100 euro meegedeeld in de kosten van de keuring dan houdt de verkoper $1500-100 = 1400$ euro over als resultaat.

Nu gaan we kijken wie de winnaar is.

- Dit doen we door te kijken wat het totale bedrag is van zowel de verkoper als koper.

Tijdens het verkopen van auto's hebben we 2 verschillende situaties gezien. In de eerste situatie was alles over de auto bekend en in de tweede ronde had alleen 1 persoon toegang tot de informatie over de auto. Wel kon deze informatie aangekocht worden waardoor beide personen weer dezelfde informatie zouden hebben.

Dit spel wil duidelijk maken wat de rol van informatie is in de economie en waarom mensen niet altijd rationele beslissingen nemen. We beginnen eerst met de informatie verdeling en komen dan terug op de gedragseconomie.

Asymmetrische informatie

Bij asymmetrische informatie staat de rol van informatie tijdens economische beslissingen centraal.

Zoals we in het spel hebben kunnen zien, is in ronde 1 bij beide partijen duidelijk wat de kwaliteit en prijs van de auto was. In ronde twee wist alleen de verkoper de kwaliteit van de auto.

De verkoper had een duidelijk voordeel in de tweede ronde aangezien hij alle informatie had. Hij kon hier over liegen, zonder dat de koper hier iets van merkte. Deze wist niet wat de kwaliteit van de auto was.

Het voordeel van meer of betere informatie leidt tot een asymmetrische verhouding. In een asymmetrische informatie setting heeft 1 partij meer informatie dan de andere en kan daardoor een voordeel behalen.

Andere voorbeelden waar het hebben van informatie invloed kan hebben op beslissingen zijn onder andere:

Een persoon die een verzekering afneemt maar erg veel rookt, kan invullen dat hij niet rookt, zonder dat de verzekering dit weet. Hij heeft namelijk minder informatie over de verzekeringsnemer dan de verzekeringsnemer zelf.

Het kopen van een ingewikkelde verzekering, eigenlijk weet je niet wat je koopt, de andere partij heeft meer informatie en kennis van het product, toch vertrouw je snel een persoon die jou zoiets verkoopt.

Iemand die in het bestuur zit van een groot bedrijf heeft kennis en informatie over het bedrijf. Veel meer informatie dan een belegger die niks van het bedrijf weet. Hierdoor zou de bestuurder makkelijk beslissingen kunnen nemen wanneer hij een aandeel moet kopen of niet van zijn eigen bedrijf. (dit is daardoor ook bij wet verboden omdat er misbruik van gemaakt kan worden)

De rol van informatie wordt steeds belangrijker bij economische beslissingen. Gaan traditionele economische theorieën ervan uit dat alle informatie volledig en beschikbaar is, de information

economics bestudeert de situaties waar deze net even anders zijn. Tijdens dit spel hebben jullie gezien wat de rol van asymmetrische informatie is doordat 1 persoon meet informatie had dan de andere partij.

Hoe zouden jullie asymmetrische informatie tegen gaan?

Hebben jullie voorbeelden waarbij 1 persoon meer informatie heeft dan een andere partij?

Gedragseconomie

De traditionele economie gaat uit van rationaliteit. Beslissingen worden genomen door het maken van een rationele analyse. Bijvoorbeeld door een vraag en aanbod lijn. Als we kijken hoeveel vraag er is en hoeveel aanbod, kan de ideale prijs berekend worden. In de realiteit is het echter niet zo makkelijk om rationele afwegingen te maken. Dit wil ik laten zien aan de hand van het spel. Er zijn veel meer factoren die meespelen als je beslissingen neemt.

In dit spel kon je extra informatie kopen. Als je veel geld uit gaat geven is het logisch als je alles weet van het product. Hoeveel mensen hebben eigenlijk niet een keuring aangevraagd maar wel een deal gesloten? Best veel? Terwijl je niet wist wat de kwaliteit van de auto was.

Deze mensen hebben erop vertrouwd dat de verkoper eerlijk was over zijn auto, terwijl er geen rationele basis tegenover staat. Je hebt minder kennis van het product en weet niet wat de kwaliteit van de auto was. Je weet dus niet of hij de waarheid verteld of dat hij je zit voor te liegen. Toch word er door deze mensen een deal gemaakt maar niet gekeurd of de auto van de kwaliteit is die de verkoper voorstelde.

Deze beslissing kan op veel verschillende aspecten rusten, je zou iemand bijvoorbeeld al kunnen kennen en vertrouwen waardoor je niet twijfelt aan een beslissing, de reputatie zou erg goed kunnen zijn waardoor je iemand vertrouwd, of je hebt andere redenen waarom je de auto toch koopt.

Uit deze beslissingen blijkt dat gedrag invloed heeft op het maken van keuzes en keuzes niet altijd rationeel gemaakt worden op basis van volledige informatie. Dit word bestudeerd in de gedragseconomie. Hierin staat centraal waarom economische beslissingen genomen worden vanuit het gedrag en psychologie van de mens.

Appendix D: List of schools participated

Economie & Experiment - 11-11-2010 t/m 17-12-2010					
Datum	School	Adres	Postcode	Plaats	Provincie
11-11-2010	Driestar College	Ronsseplein 1	2803ZV	GOUDA	Zuid-Holland
12-11-2010	Stedelijk Gymnasium Den Bosch	Mercatorplein 2	5223LL	DEN BOSCH	
16-11-2010	Grotius College	Juniusstraat 8	2625XZ	DELFT	Zuid-Holland
17-11-2010	Willem de Zwijger College	Nieuwe 's Gravelandseweg 38	1405 HM	Bussum	
18-11-2010	t Atrium	Paladijnenweg 611	3813KD	AMERSFOORT	Utrecht
22-11-2010	OSG Erasmus	Sluiskade NZ 68	7602HT	ALMELO	Overijssel
23-11-2010	Emmauscollege	Alexandriestraat 40	3067MR	ROTTERDAM	Zuid-Holland
24-11-2010	Calvijn Groene Hart	3e Barendrechtseweg 450	2992SN	BARENDRECHT	Zuid-Holland
29-11-2010	Walburgcollege	Norderstedtplein 6	3332GK	ZWIJNDRECHT	Zuid-Holland
30-11-2010	Mencia de Mendoza	Mendelssohnlaan 1	4837CV	BREDA	Noord-Brabant
01-12-2010	Driemark	Zonnebrink 15	7101NA	WINTERSWIJK	Gelderland
02-12-2010	Rodenborch College	T.M. Kortenhorstlaan 4	5244GD	ROSMALEN	Noord-Brabant
03-12-2010	Stedelijk Dalton Lyceum Dordrecht	Overkampweg 125	3318AN	DORDRECHT	Zuid-Holland
06-12-2010	Gymnasium Felisenum	Van Hogendorplaan 2	1981EE	VELSEN-ZUID	Noord-Holland
07-12-2010	Dollard College, Hommesplein	Dr. J. H. Hommesplein 2	9671CZ	WINSCHOTEN	Groningen
08-12-2010	Stedelijk Dalton Lyceum Dordrecht	Overkampweg 125	3318AN	DORDRECHT	Zuid-Holland
09-12-2010	Wartburg College, Guido de Bres	Smeetslandseweg 127	3079CR	ROTTERDAM	Zuid-Holland
10-12-2010	CSG Comenius	Achter de hoven 118	8933CR	LEEUWARDEN	Friesland
14-12-2010	RSG Enkhuizen	Boendersveld 3	1602DK	ENKHUIZEN	Noord-Holland
15-12-2010	De Goudse Waarden	Heemskerkstraat 105	2805SN	GOUDA	Zuid-Holland
16-12-2010	Comenius college	Bisonlaan 1	1217GH	HILVERSUM	Noord-Holland
17-12-2010	Veenlanden College	Diamant 9	3641XR	MIJDRECHT	Utrecht