UNIVERSITY OF TWENTE.

The doubtful science:

An investigation of predictors of trust in science among university students

Laura Hartung, 2207540

Bachelor Thesis in Communication Science (BSc)
Faculty of Behavioral, Management and Social Sciences
Supervisor: Sikke Jansma
25th , 2021

Abstract

Introduction: Since the Covid-19 pandemic, trust in science is shrinking. However, the loss of trust in science and its executants is not a new phenomenon and the concept of trust issues in science reaches beyond those of the pandemic.To overcome the loss in trust, the predictors of trust in science have to be examined.

Objective: The aim of this study is to see which factors predict trust in science among University students. In particular, this study focuses on students of the University of Twente. Furthermore,a comparison analysis was conducted. Here, the aim was to find out if significant differences appear between the technical and non-technical students.

Methods: For the purpose of this study, an online questionnaire among students of the University of Twente (N=255) was conducted. To measure students' trust in science, the questionnaire asked for the predictors of trust in science, as well as the respondents' knowledge in science and their attitude towards science. Furthermore, the predictors "Religion", "Trust in Media", "Trust in Scientists" and "Reputation of Scientific Institution" were measured.

Results: The insights gathered suggest that, in general, the trust in science of students at the University of Twente is relatively high. Nevertheless, differences appeared between technical and non-technical students. Findings show that technical students have a higher trust in science as well as a higher scientific literacy compared to non-technical students.

Conclusion: Based on the given results, it can be said that the trust in science in both technical and non-technical students is high. Several predictors were proven to be an antecedent of trust. Furthermore, "Study Faculty" was found to be another predictor of trust in science.

Keywords: Trust in Science, Social Acceptance, Students of the University of Twente

Table of content

1. Introduction

Discussions such as the current Covid-19 vaccination, climate change or the concern of genetically modified foods are triggering reactions in the public that revolve around issues of trust in both science and scientists (Ipsos MORI, 2011; Scientific American, 2010). This especially counts when emotionally laden or highly intimidate topics, such as those associated with health are discussed (Rousseau et al, 1998). A contribution to the decreased levels of trust are news stories of researchers manipulating data, engaging in potentially unethical practices, and withholding results (Crocker & Cooper, 2011). Prominent example is the case of Diederik Stapel, former Dutch social psychologist, who got suspended from Tilburg University after it became public that the researcher had manipulated data results of his experiments (Hendriks et al., 2016). Stapels legal case received substantial attention, leading to discussions about the effects of fraud in science might have on public trust in science and its acceptance (Hendriks et al., 2016). However, the loss of trust in science and its executants is not a new phenomenon and the concept of trust issues in science reaches beyond such incidental cases like the one of Stapel.

More than twenty years ago, surveys already demonstrated that the scientific community has credibility problems (Haerlin & Parr, 1999). According to survey data from 1999, 26% of European citizens named environmental organizations when asked whom they trusted the most to tell the truth about a risky perceived scientific topic (Haerlin & Parr, 1999). Only 6% of the respondents named universities or other scientific institutions.

According to Hendriks et al., (2016), the concept of trust is inevitable for scientists to conduct science, as well as for the public dealing with scientific topics in their everyday life. Nowadays, people can easily access all kinds of scientific knowledge online, but since people outside of the scientific community own a limited understanding of science, they have no other option than to trust in scientists and their publications (Hendriks et al., 2016). According

to Fiske and Taylor (1991), former research has discovered that people rely on their cognitive heuristics when reporting attitudes and opinions on prominent issues. To illustrate, the use of cognitive heuristics in the discussion about global warming, debated between Republicans and Democrats of the USA. As explained by Leiserowitz et al. (2010), the lack of knowledge about global warming in the American society suggests that a higher percentage of individuals use simple heuristics like trust, to make sense of complex and conflicting information like the global warming debate. Meaning, that the factor of trust influences greatly the decisiveness of individuals choosing what they might perceive as „right“ or „wrong“.

Since the 1980s, the concept of trust in science has attracted many researchers and remains to be a popular research topic till today (e.g. Achterberg et al., 2017; Brewer and Ley, 2013; Liu and Priest, 2009; Myers et al., 2017). One of the most prominent studies which did research in this matter, is the study of the Spanish Foundation for Science and Technology (FECYT), researching the public perception of scientists throughout Spanish society. Findings show that 53% of the participants considered that scientists' research can be influenced by their financial supporters. In contrast, only one third said that scientists defend themselves against being influenced, while 25% believed that those researchers are unable to counter such an influence (Lujan & Todt, 2007). As the research displays, there is a relatively clear perception among the respondents about how scientists' work can be influenced and in turn how that can influence the work's trustworthiness.

Having those examples in mind, it becomes obvious that trust in science is important when it comes to the acceptance of science and the public's belief in scientific information. Still, trust is known as a vague undefined construct based on emotions, knowledge, beliefs, and relationships (Nadelson et al., 2014). Therefore, the factors of trust in science should be further investigated.

Alongside the vague understanding of antecedents of trust, Nadelson et al.(2014), states that within the scientific community, science and scientists maintain higher levels of

trust compared to the communities outside of the scientific field. However, research on the antecedents of trust in science was rarely conducted in this community. As research shows, most findings towards the topic of trust in science relate to the mere public, but do not focus on the scientific community. However, in order to get a more accurate picture of what factors influence trust in science and how these factors influence a person's level of trust, it is important to gather impressions in communities that are in themselves considered to be very trusting towards the given topic. On account of this, this research will focus on the scientific community, by investigating students' trust in science.

Therefore, to better understand the concept of trust in science and to find possibilities on how to enhance scientific acceptance, it is important to understand which factors may influence the trust factor. Hereby, it is important to filter out which factors may or may not have a negative or positive effect on trust. Therefore, in this research paper, the following research questions will be investigated:

What factors shape trust in science among University students?

.

2. Framework

The acceptance of science depends on numerous different factors which influence trust in science. Therefore, the relation between trust and acceptance needed to be formulated in a clearer way. To be able to do so, the concept of trust and the concept of social acceptance of science have to get explained. Furthermore, antecedents that influence trust in a positive or negative way will be identified and hypotheses will be established. Moreover, a model of the given research will be created, to illustrate the construction of research.

2.1. Concept of Trust

Findings show that trust can have crucial consequences for the perceptions of science and therefore raise the question of what explains trust itself (Brewer & Ley, 2013). In answering this question, the multifaceted nature of the concept of trust has to be taken into account (Lee et al., 2005, p. 246). Lee et al. (2005) argue that the concept of trust differs per individual having a different influence on the perception of science and thus should not be seen as a generic construct. In addition, it is arguable that the effects of trust vary from one area of science to another (Liu & Priest, 2009). As Liu and Priest (2009) explain, trust should be differentiated in specific areas, as each area of science and technology might trigger completely different concerns. To illustrate, genetically modified food might raise public health concerns while nanotechnology might make people worry about their privacy (Liu & Priest, 2009 p. 709). Building on the idea of Liu and Priest (2009) that different forms of trust can operate different effects, the following tries to explain the concept of social trust and its influence on the perception of science.

Investigators from sociology, psychology, economics, or political science have tried to make sense of trust and unfold ways to conceptualize the term (Hoff & Bashir, 2014).
For instance, Hoff and Bashir (2014) have classified three layers of trust, namely dispositional trust, situational trust, and learned trust. Dispositional trust represents long-term tendencies deriving from the individual's culture, the gender, the age and the individual's personality, which are all independent of a specific context or situation. Situational trust is described as being dependent on the context of interaction and on the context-dependent characteristics of the actor (She et al., 2021). Learned trust is based on the individual's evaluation of past experiences or current interactions. Hereby, this layer of trust is directly influenced by an individual's preexisting knowledge, collected from former experiences with a person or product (Hoff & Bashir, 2014).

Nevertheless, besides the layers of Hoff and Bashir, researchers defined the concept of social trust. Social trust defines as the attitude that people rely on others and expect beneficial outcomes from them as a result (Wüstenhagen et al., 2007). Thereby social trust can be explained as a belief that a person or institution will act in the best interest of oneself (Wüstenhagen et al., 2007). Social trust plays an important role in the individual's perception of a certain product, information or scientific outcome. Certainly, trust in science can be defined as social trust, which denotes impersonal trust attributed to individuals working in institutions.

2.1.1 Social Acceptance

According to Hoff and Bashir (2014), organizations, governments, cultures, societies and even nations can all be explained by the concept of social trust. Furthermore, social trust can define the way people interact with science and their willingness to accept this information (She et al., 2021). By that, She et al. (2021) expresses that social trust is directly influencing the acceptance of science. In agreement to that, Chryssochoidis et al. (2009) summarized based on their results, that social trust and the perception of science is shapeable and therefore often gets formed by different factors. For instance, as Rutjens et al. (2018) explains, people's opposition to science is often associated with identity factors, like political affiliation or religious identity (Swift, 2017; Weisberg et al., 2018). According to literature, besides most of the factors influencing the acceptance of science, they also show a connection with a person's trust level in science. Hence, it can be concluded that trust in science partially has an effect on the acceptance of science. Nevertheless, since this study is focussing on the aspect of trust in science and its antecedents, the relationship between trust in science and acceptance of science will not be further examined.

2.2 Antecedents

There are many antecedents that influence trust in science. Specific drivers that could be found are, namely, scientific worldview, scientific temper, scientific literacy, political affiliation, religion, trust in media, trust in scientists, reputation of scientific institutions and demographics like gender and age.

2.2.1 Scientific Temper, Scientific Literacy, Scientific Worldview

One factor that has an impact on trust is called scientific temper. Scientific temper can be described as an attitude towards science, describing a person's tendency of logical, rational and scientific thinking (Arseculeratne, 2014). A person is considered to have scientific temper if the person enables creative thinking about natural phenomena, is engaging in valid scientific research on these phenomena and employs a scientific method of decision-making in everyday life (Arseculeratne, 2014). For instance, this can involve repeatedly observing and verifying a fact before forming a hypothesis.

Nevertheless, this stands in affiliation with the concept of scientific literacy. Scientific literacy can be defined as a cultural stock of knowledge that includes knowledge retrieved through basic textbook science facts, basic knowledge of scientific methods like experimental design and the appreciation of social benefits that result from science (Miller, 2004). Both concepts form a way of basic scientific understanding, which in turn influences individuals attitude towards scientific work and findings (Gauchat, 2011). This is also confirmed by Snow and Dibner (2016), who say that it can be argued that the concepts of scientific temper and literacy are particularly valuable to further understand public acceptance of science. Still, to develop scientific literacy and to some degree scientific temper, a basic trust level towards science, scientific work and scientists has to be given (Gauchat, 2011). Thus, it can be assumed that there is a relationship between the scientific temper and the scientific literacy of a person and the person's trust in science (Kavner, 2020).

Next to both concepts, there is the scientific worldview of an individual, which is considered to have an influence on trust. The scientistic worldview can be described as a worldview characterized by the tendency to justify one's beliefs and behavior with scientific findings (Jach, 2019). Hereby, individuals consider the scientific language to be the most valuable method of relating to the world and to the phenomena that occur in it (Jach, 2019). Furthermore, Jach (2019) describes individuals with a higher scientistic worldview to have a higher tendency to give unconditional trust to scientific methods, due to individuals' perception of science as a source of hope. Thereby, those individuals consider scientists as the only trustworthy experts and see science as a tool of practical influence on the physical and social environment. Thus, the following hypotheses can be formulated:

H1(a): A person's scientific worldview has a positive effect on trust in science.
H1(b): A person's scientific temper has a positive effect on trust in science.
H1(c): A person's scientific literacy has a positive effect on trust in science.

2.2.2 Political Affiliation

Research showed that the political affiliation of an individual has an impact on how science is perceived (Lujan & Todt, 2007). Scarfuto (2020) supports this conclusion by saying that the political affiliation of people might impact their perception of science. Political affiliation can be defined as an individual's support of a political party (Jost, Federico, & Napier, 2009). As mentioned in Hmielowski et al., (2014), former research shows that there are different ideological divisions in the trust of scientists related to political parties (Brewer & Ley, 2012). To illustrate, researchers focused on the US have documented that liberals are generally more trusting than conservatives (Gauchat, 2012). Another research demonstrating the evidence in the influence of political affiliation on trust is the one of the Pew Research Center conducted

in 2019, displaying that people on the left express more trust in scientists than people on the right political side.

Also, Scarfuto (2020) sees a difference between the perception of science among Republicans and Democrats, stating that trust is the decisive factor for it. Democrats seem to have a more positive attitude towards new technologies and sciences, compared to Republicans, the conservative political opponent. Hence, it can be concluded that Democrats tend to trust more in new scientific discoveries and therefore are keener to trust in science work. This can be explained by Siegrist et al. (2000), saying that people tend to ultimately accept the claims of experts and scientists who share their values and beliefs. Therefore, political affiliation can be seen as a predictor of trust. Consequently, the two hypotheses are the following:

H2(a): A conservative political orientation has a negative effect on people's trust in science.

H2(b): A left-oriented political orientation has a positive effect on trust in scientific information.

2.2.3 Religion

There are indications that religious beliefs are consociated with less supportive attitudes towards science (Brewer & Ley, 2013). Studies unveiled that people who are more religious have the tendency to have more negative views on scientific topics, compared to people who are less religious (Allum et al., 2014; Scheufele et al., 2009). According to Castell et al. (2014), people who have a more creationist viewpoint are more unlikely to think that science will make people's life easier. However, a survey conducted by the Pew Research Center demonstrated that even people who had strongly religious beliefs were not completely anti-science (Castell et al., 2014). Furthermore, the majority of this group of people did not see science as conflicting with their beliefs. Nevertheless, the regularity of attendance at

religious ceremonies can influence the perceptions of science (Liu & Priest, 2009; Nisbet & Goidel, 2007; Stewart et al., 2009). As former research showed, people who often attend religious services have a higher chance to be exposed to cues from religious leaders and to religion-based political discussions (Scheufele et al., 2003). Hence, such attendance can shape the trust in sources of scientific information (Brewer & Ley, 2013). Subsequently, the prospective for conflict between the religious and scientific worldview proposes the possibility of a negative relationship between attendance at religious services and trust in scientists or science (Gaskell et al., 2005; Nisbet & Goidel, 2007).

H3: A religious commitment has a negative effect on trust in science.

2.2.4 Trust in Media

Prior evidence for media effects on trust in science and scientists are limited, still very suggestive (Hmielowski et al., 2014). As an example, serve the findings of Nisbet et al. (2002), who displayed that media effects on the perceptions of science, have the tendency to dampen the support for science, when media sources portray negative images of scientists. On the contrary, the media greatly enhanced trust in science, when it shared a person's values, or represented scientific findings in a positive way (Hmielowski et al., 2014). Despite the positive effects, scientists have proclaimed concerns regarding media's impact on science news by asking whether the lack of quality control in online media may threaten trust in science (Weingart & Guenther, 2016).

Actually, there are research findings and theoretical reasons to expect a positive relationship between media and trust in science. Particularly, research has shown that media usage can increase scientific knowledge (Cacciatore et al., 2014; Su et al., 2015) and enhance a positive attitude toward science (Dudo et al., 2011). Other findings show that science news framing can positively influence science information processing (Scheufele & Lewenstein,

2005). However, it must be noted that the framing can also lead to a negative science information processing (Nisbet et al., 2002).

Nonetheless, for the media to have such influence, it is crucial that people perceive the respective media as trustworthy (Schranz et al., 2018). To be more precise, if the case occurs that a person distrusts the media, the positive effects of media on trust in science do not apply anymore for that person (Huber et al., 2019). While there are large findings of literature researching the relationship between media usage and attitudes toward science (e.g. Anderson et al., 2012; Gerbner, 1987; Hmielowski et al., 2014; Nisbet et al., 2002; Scheufele & Lewenstein, 2005), less research has been conducted on the concept of trust in media and its relation towards trust in science. Nevertheless, as the previous examples have shown, trust in media indirectly has an impact on trust in science. Hence, the following hypothesis was created:

H4: Trust in media has a positive effect on trust in science.

2.2.5 Trust in Scientists

Another antecedent of trust in science could be found in the concept of trust in scientists. As Nadelson et al. (2014) explains, trust in scientists can substantially influence the consideration of scientific developments and activities. Supported by numerous studies, fundamental trust in scientists is an important heuristic people use when reporting their opinions on science-related topics (Fiske & Taylor, 1991). Thereby, non-scientific experts take into account an expert's expertise, benevolence and integrity when deciding if to believe a scientist's statement on a scientific issue. Here, non-scientific experts or so called "laypeople", decide if the information can be seen as a trustworthy source or not (Hendriks et al., 2016). This suggests that the reputation of a scientist directly influences the perceived

credibility of an information, which in turn has a great influence on the trust level of science. Moreover, as Nadelson et al. (2014) continues, people who hold a low trust level in scientists are more likely to discount scientific processes and evidence, resulting in people being more prone to use non-scientific approaches to explain phenomena (Shermer, 2002). Consequently, there is justification for the examination on the levels of trust in scientists in relation to the building of trust in science. Hence, the hypothesis is following:

H5: Trust in scientists has a positive effect on trust in science.

2.2.6 Reputation of Scientific Institution

The concept of reputation can be seen as another antecedent of trust in science. As Fombrun and Shanley (1990) describe, the concept of reputation refers to the extent to which an organization or individual is held in high esteem by being able to meet the expectations of society (Siltaoja, 2006). In this research, the concept of reputation refers to scientific institutions, like universities or research institutes. Accordingly, the reputation of a scientific institution is determined by the signals that people receive regarding its public behavior (Fombrun & Shanley, 1990). Those signals, for instance, can be the quality of academic performance, the financial performance, the institution's authenticity, transparency, or the institution's appearance in the media (Brammer and Pavelin, 2006).

According to Ganesan (1994), reputation is of great importance for an institution's success and is positively related to trust. To illustrate, the concept of reputation is used in electronic markets as a trust-enforcing and incentive mechanism with the aim to avoid cheaters and frauds (Wang & Vassileva, 2003). As some researchers have treated trust as a consequence of good reputation (Keh & Xie, 2009), others stated the opposite by referring that reputation is an outcome of trust (Yoon et al., 2006). Despite the different opinions, it is

undeniable that reputation has an influence on the trust level of a person and potentially on the person's trust in science (Wang & Vassileva, 2003). As this study has a focus on students' perceived reputation on their University, it can be assumed that a positive reputation of this scientific institution will favorably affect students' trust in science. Accordingly, the following hypothesis can be proposed:

H6: A positive reputation of a scientific institution has a positive effect on trust in science.

2.2.7 Demographics (Gender, Age)

Numerous studies showed that gender, age, education, income, and race can influence perceptions of science (Anderson et al., 2012; Von Roten, 2004; Bak, 2001). As an example serves the study of Hayes and Tariq (2000), who researched about stereotypical assumptions concerning anti-scientific attitudes among women. Their study delineates the social and economic determinants of gender differences in attitudes toward science. Most of the published studies on women and science found significant gender differences, with women showing less trust in science compared to men (Fox and Firebaugh, 1992; Pifer, 1996; Barke et al., 1997). Those findings are also supported by Scarfuto (2020), who stated that mostly men perceive themselves to be more knowledgeable about science than women. Nevertheless, this does not correspond with a higher understanding and literacy among men. According to Castell et al. (2014), when asking people if they agree with the statement that „The information I hear about science is generally true “, men tend to agree more with that statement compared to women (57% versus 46%). However, Castell et al. (2014) states that this gender difference does not exist among 16–24-year-olds. Here, both genders tend to have similar views. Another study found that young people tend to have a more positive attitude towards scientific related projects while other studies reported the opposite (Cheikh et al.,

2014). According to the mentioned findings, it is arguable if trust in science may vary across gender and age lines. Therefore, the following hypotheses can be formulated:

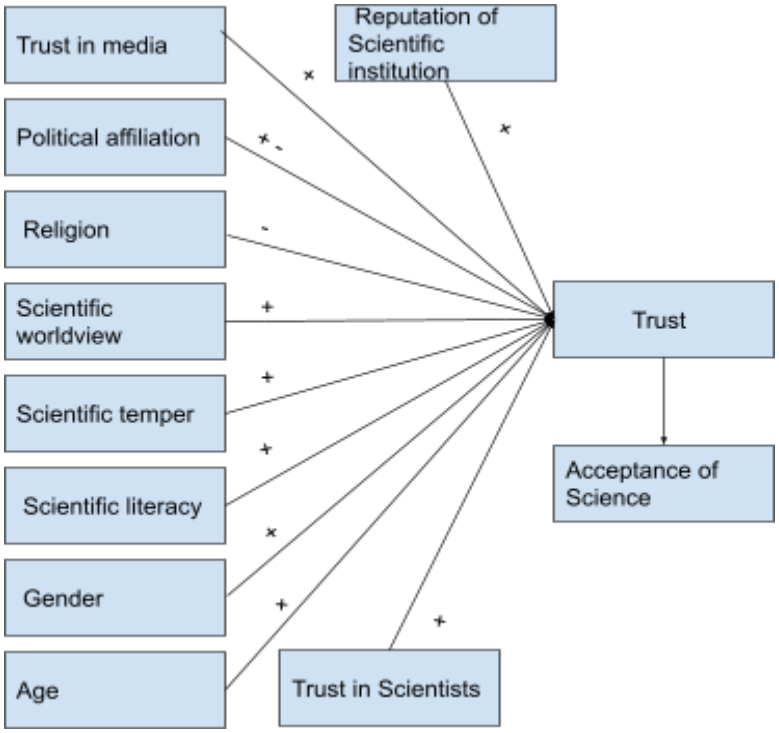
H7(a): Men have a higher level of trust in science compared to women.

H7(b): Age has a positive effect on trust in science.

2.3 Research Model

Based on the discussed and hypothesized relationships, the visual representation of the research model can be found in figure 1.

Figure 1.
Research model



3. Method

3.1. Research Design

For the purpose of answering the research question of this study, a quantitative study was conducted. In order to get an answer, a questionnaire was selected as the preferred design method, as a questionnaire comes with the advantage to collect data on a larger scale in a shorter period of time (Babbie, 1998). Moreover, a questionnaire was the best fitting option for this research, considering the formulation of the research question. Hereby, the study was conducted among students of the University of Twente, located in Enschede, as they form the research population within the study. As a larger dataset was expected, the data got gathered with the help of the online survey software program Qualtrics. Qualtrics enables to collect larger amounts of data over a longer period of time (Van den Berg & Van der Kolk, 2014). In addition, the Qualtrics program might result in participants being more prone to respond, as it enables individuals to fill out data in an anonymous way.

3.2. Procedure

First of all, before the survey was distributed among the chosen target group, the procedure of research had been approved by the Ethics Committee of the Faculty of Behavioral, Management and Social sciences of the University of Twente. The survey started with a short description of the context of the study, as well as an informed consent. Within the informed consent, it was made clear that the responses were gathered anonymously. Furthermore, the researcher reassured that the survey data would be handled confidential and used solely for academic purposes. Thereby, the survey explained in detail that the data would be stored safely. In addition, the participants were informed about the possibility to withdraw their participation at any time without providing any reasoning, since participants always have the

right to retain from answering questions (Munhall, 1989). To ensure that the respondents of the survey would only be students of the University of Twente, the first question was asking if the participant would be a student of the mentioned University. Subsequently, demographic questions were asked, including the question about the gender, age, the participants main study, the participants nationality and the political affiliation of the participant. Following, the main part of the survey started. Firstly, the participants had to answer questions related to the independent variables within the research model. Secondly, questions were asked about the dependent variable of the study, namely „Trust in Science“, to which the respondents had to provide answers. At the end of the survey, the participants were thanked for their contribution to the study. Moreover, the contact information of the researcher was displayed, so that the participants were able to reach out to the researcher in case of any questions. All the collected data was gathered within the time period of May 18 2021 to May 24 2021.

3.2.1 Sampling

The target group was reached by means of a personal invitation message sent out by the researcher. Hereby, the channels WhatsApp and Telegram were used. Furthermore, an invitation to participate in the study got distributed through the Social Media channels of the researcher, like Instagram, LinkedIn and Facebook. After filling in the survey, participants were asked to send the invitation message to other students which may fit the described target group. Hereby, a combination of convenience and snowball sampling was used. Convenient sampling involves the selection of participants on the basis of convenient availability Panacek and Thompson (2007). Snowball sampling is a method where the recruitment of participants by recommendation of already selected participants takes place (Biernacki & Waldorf, 1981). The invitation to take part in the study was visible during the whole period of data collection. In order to participate, respondents had to meet the following criteria. Firstly, the participants

had to be able to understand English language, as the survey was conducted in English. Secondly, all participants needed to be current students of the University of Twente.

3.3. Pre-test

Before the survey was distributed, a pre-test was conducted. For this pre-test, twelve students of the University of Twente, screened a template version of the questionnaire from beginning to end. After giving consent, the participants received the template, filled out the survey and were asked to give written or oral feedback via Whatsapp afterwards. Hereby, the students taking part in the pre-test, studied different study programs of the University of Twente. Moreover, the gender participation was equally balanced with six male and six female participants. Based on the students feedback, the survey had been adjusted. For instance, adjustments were made in the individual questions, by adding further explanations or rephrasing single words. Furthermore, the sequence of the questions had been restructured, as well as the structure of the scales.

Several pre-test participants noticed that the seven likert-scale for the construct of trust in media was reversed compared to the seven likert-scale of the other construct questions. As seven participants stated that this change was very confusing to them, the scale sequence got changed to begin with the option „strongly disagree“ instead of the rating option „ strongly agree“. In addition, more than half of the pre-test participants have remarked that in a number of questions, the sentence „To what extent do you agree or disagree with the following statement“ was missing, which caused confusion. Therefore, it was decided to change the question type of all the questions from a multiple choice question type to a matrix table question type in Qualtrics, to ensure continuity. Hence, all questions got a header asking the participant to indicate their agreement or disagreement with the following questions. After the

implementation of feedback, the same participants screened the survey another time to review the survey again and to ensure that the feedback was implemented in the correct way.

3.4. Instrument

In order to identify how the items performed in comparison to other variables, a validity factor analysis was conducted. To ensure the reliability of the items, the Cronbach's alpha was calculated.

3.4.1 Validity

In total, the validity factor analysis contains 32 items, separated by eight factors. As the aim of the analysis was to identify if the variables load on the same factors as determined in the questionnaire, a „KMO and Bartlett's Test" was conducted. To be defined as valid study, the „KMO and Bartlett's Test" had to score over .50. Since the score in this study was .80, the data was suitable for the factor analysis. Further, each eigenvalue for every factor of the study turned out to be over and above 1, which proved the validity of the items again.

As some of the items did not load on the expected factor, the variables needed to be adjusted. As the item „I would identify myself as a part of the scientific community" did not load on the determined factor, the item was excluded for further analysis. In addition, the item „In general, I have a positive attitude towards science" was excluded for the same reason of not loading on the determined factor. Moreover, the item „ I perceive alternative news on social media as a trustworthy source" got excluded, same as the item „I think scientists are honest when carrying out their work".

The item „All tasks human beings face can be solved by science" was not excluded from further analysis, despite its loading on two factors, as the item did load on the determined factor. Furthermore, the loading on the not determined factor was relatively low

with a rotated factor loading of .32. The same procedure was applied for „I think that scientific theories are effective to explain the world around us “.

The table of the factor analysis can be found in Appendix B.

3.4.2 Measurements

At the beginning of the survey, the question was asked if the participant is a student at the University of Twente. Followed by this, the demographics were asked, being age, gender, nationality and the educational level. Additionally, the political affiliation of the participants were measured using two scales ranging from 1-7 whether their political affiliation is rather left or right and liberal or conservative. As the variable has two items, the political affiliation was measured on two dimensions. The scale has a Cronbach's alpha of .69.

Then, the scientific worldview of a student was measured using four items „ I think that only science explains the world around us“, “The scientific method is the only reliable path to knowledge“, „All the tasks human beings face can be solved by science“. These items were partially retrieved from a study by Neil et al., (2019). The scale has a Cronbach's alpha of .82.

The described variables, as well as all other following variables of the questionnaire, were measured by a 7-point Likert scale ranging from „Strongly disagree“ to „Strongly agree“.

Consequently, the following variable „Scientific temper“ was measured on a 7- point Likert scale using the items „ I think that scientific theories are effective to explain the world around us“,“ On balance, the benefits of scientific research outweigh the risks“ and „Human problems can be understood and solved through the application of scientific methods“. The items were retrieved from a study by Mann and Schleifer (2020), who used items from the General Social Survey (GSS) in their study. The scale has a Cronbach's alpha of .65.

Additionally, the variable „Scientific literacy“ was measured using the items „ I understand the impact of science“, „I keep myself informed about scientific developments“, „I

would describe myself as being experienced with science related topics“ and „ I would describe myself as being knowledgeable about science“. The items were partially retrieved from a study by Knight (2005) and from a study by Miller (1998). The variable was found to be reliable with a Cronbach’s alpha of .82.

Furthermore, the variable „trust in media“ was measured using the items „ I perceive newspapers as a trustworthy source“, „I perceive news from national broadcasting companies as a trustworthy source“ and „I perceive news from mainstream media as a trustworthy source“. The items were retrieved from the General Social Survey (GSS). The variable was found to be reliable with a Cronbach’s alpha of .85.

The variable „ Religion“ was measured using the items „ I have a high level of religious commitment“, „I would describe myself as being active in religious services“, I believe that a higher power exists“ and „ I would describe myself as a religious person“. The items measuring „ Religion“ were retrieved from a study by Huber and Huber (2012) using the „Centrality of religiosity scale“ (CRS) and is inspired by a study of the Center for Comparative Social Surveys (2010), using items of the European Social Survey (ESS). The scale has a Cronbach's alpha of .92.

Thereafter, the variable „ Trust in scientists“ was measured using the items „ I think that scientists are honest when carrying out their work“, „When scientists change their opinion on a scientific idea it diminishes the trust I have in their work“, When scientists form a hypothesis they are just guessing“ and „ Scientists will protect each other even when they are wrong“. The items were retrieved from a study by Nadelson and Hardy (2015). The variable was found to be unreliable with a Cronbach’s alpha of .56. Being unreliable, this construct was not taken into account for further analysis.

The variable „ Reputation of scientific institution“ was measured using the items „ I think that the University of Twente carries out its work regarding scientific research

successfully and well“, „I think that the university of Twente acts in the best interest of society“, „I would describe the researchers work at the University of Twente as innovative“ and „ I think that the University of Twente has a good reputation among students“. The items were inspired and partially retrieved from a study by Weiss et al. (1999). This variable's items reached a Cronbach's alpha of .77.

After the dependent variable „ Trust in science“ was measured using the items „ I trust science to make life better for people“, „Scientific theories are trustworthy“, „We can trust science to find the answers that explain the natural world“ and „ All things considered, science can be trusted“. The items measuring the dependent variable were retrieved from the study by Nadelson and Hardy (2015), using the „Trust in Science and Scientists Inventory“ scale (TSIS). The items reached a Cronbach's alpha of .75. A table of the Cronbach alphas can be found in Appendix C.

3.5. Participants

In total, 317 respondents participated in the survey within this research. However, due to incomplete answers, 62 questionnaires were deleted. Furthermore, one respondent had to be deleted from the data, as the person was not a student of the University of Twente. Therefore, the used data set from this study included 255 respondents (see Table 1). Among the respondents, 40 % was male and 57,6% female, 1,2 % did not specified their gender and 1,2% said they were non-binary. The age ranged from 18 to 35 years with the average of 23 years (SD= 2.49). According to data, 36.9 % of the participants had a German nationality and 32.5 % of the participants had a Dutch nationality. Besides these two nationalities, 12.5% participants were EU citizens not having a German or Dutch nationality, while 18% participants were Non-EU citizens. Furthermore, 61,2 % of the participants were involved in a study program of the non-technical faculty BMS, while 38.8 % were involved in a study

program of a technical faculty (ET Faculty, EEMCS Faculty, TNW Faculty, ITC Faculty). Most of the participants were in their third year of bachelor study (N=81),72 were in their second year and 69 specified to be in their master. 17 participants were in their first year of bachelor study. Under the category „Other“, 5 participants indicated to be a PhD candidate, 2 participants did their fourth year of bachelor study and 2 participants were Erasmus Exchange students at the University. Moreover, 5 participants indicated to be pre-master students.

Table 1.
Demographics

Items	Category	Frequency	Percentage
Gender	Male	102	40.0
	Female	147	57.6
	Non-Binary	3	1.2
	Prefer not to say	3	1.2
Nationality	Dutch	83	32.5
	German	94	36.9
	EU	32	12.5
	Non-EU	46	18.0
Study Faculty	BMS Faculty	156	61.2
	ET Faculty	35	13.7
	EEMCS Faculty	46	18.0
	TNW Faculty	16	6.3
	ITC Faculty	2	0.8
Year of study programme	First year of Bachelor	17	6.7
	Second year Bachelor	72	28.2
	Third year Bachelor	81	31.8
	Master	69	27.1
	Other	16	6.3

4. Analysis

In order to test the hypotheses displayed in the theoretical framework, the results of the survey were analyzed with the help of the program SPSS. After proving the reliability and the validity of the survey items, a correlation analysis was conducted to determine how the variables correlated with each other. Afterwards, a multiple regression analysis was conducted to ascertain the significance of the effects on the dependent variable. Moreover, a t-test was assessed to compare social science students (non-technical faculty) with non-social science students (technical faculty).

4.1 Descriptive Statistics

Before starting with the correlation and regression analysis, it is advisable to look into the descriptives of the research.The following scores were generated from the computed variables on SPSS. First, „Trust in science“ (M=5.56, SD= .71) reached the highest scores among all tested variables (see Table 2). This means that the participants had a relatively high trust in science. In contrast „ Religion“ (M=2,87, SD=1.63) scored relatively low, suggesting that on average, participants were not highly committed to religion. In addition, the participants agreed on „Scientific Temper“ (M=5.37, SD=. 87) and „Scientific Literacy“ (M=5.28, SD= .88), which states that, on average, participants had an positive attitude towards science and perceived themselves as knowledgeable in sciences. Moreover, the score of „Reputation of Scientific Institution“ (M=5.50, SD= .76) reached relatively high, demonstrating that the participants connected the measured scientific institution (University of Twente) with a positive reputation. The variable „Scientific Worldview“ (M=4.41, SD= 1.43), scored relatively high, which suggests that, on average, participants had a scientific worldview.

Furthermore, „Trust in Media“ (M=4.07 , SD= 1.25) scored the second lowest of all constructs, but still positive, which displays that the participants had trust in media.

Table 2
Descriptive Statistics

Variable	N	Mean	Standard Deviation
Scientific Worldview	255	4.41	1.43
Scientific Temper	255	5.37	.87
Scientific Literacy	255	5.28	.88
Trust in Media	255	4.07	1.25
Religion	255	2.87	1.63
Reputation of Scientific Institution	255	5.50	.76
Trust in Science	255	5.56	.71

4.2 Correlation Analysis

To see if the variables correlated with one another or not, a Pearson's correlation analysis was computed (see Appendix D). Hereby, an alpha level of .05 was used to indicate the statistical significance of a correlation. As the correlation between two variables has to score under $p < .05$ to be significant, in total 47 correlation could be defined as significant. The strongest correlation between the dependent variable and the independent variables was the correlation of "Trust in Science" with "Scientific Temper" ($r = .51$, $p < .01$), which was followed by the correlation between "Trust in Science" and "Scientific Worldview" ($r = .40$, $p < .00$) and "Trust in Science" and "Reputation of Scientific Institution" ($r = .34$, $p < .01$). Furthermore, a significant correlation was found between "Trust in Science" and "Scientific Literacy" ($r = .28$, $p < .01$) and between "Trust in Science" and the independent variable "Trust in Media" ($r = .17$, $p < .01$).

Moreover, three significant negative correlations were found between the dependent and independent variables. Hereby, the strongest correlation was between “Trust in Science” and “Religion” (r = -.33, p < .01, followed by the single item variables of “Political Affiliation”. Here, the item“ What is your political affiliation?-left.right” (r = -.16, p < .01) has a less strong correlation than the item “What is your political affiliation?-liberal.conservative” (r =- .31, p < .01). As the results display, all the independent variables significantly correlated with the dependent variable, with the exception of the independent variables “Age group” (r = .03, p < .67) and “Gender” (r = -.11, p < .07).

The significant strongest correlation among the independent variables was the correlation between “Scientific Temper” and “Scientific Worldview” (r = .45, p < .01), followed by the correlation between both single item questions of “Political Affiliation” (r = .53, p < .01) and the correlation between “ Religion” and the item “What is your political affiliation?-liberal.conservative.” (r = .30, p < .01).

Nevertheless, there were negative correlations between the variable “Religion” and the variable “ Scientific Worldview” (r = -.39, p < .01), between “Religion” and the “Scientific Temper” (r = -.30, p < .01) and between “Trust in Media” and item “what is your political affiliation?-left.right” (r = -.31, p < .01). Other positive or negative correlations between independent variables scored relatively low with a pearson correlation coefficient of >.03.

4.3 Model Testing: Regression Analysis

To test the formulated hypotheses in this research, a multiple regression analysis was conducted. As the model shows, the demographic characteristics are included as predicting variables (see Table 3). As the analysis shows, the independent variables explained significantly 43.2% of variance on the dependent variable “Trust in Science” (R2 = .43, F(13,

241) = 14.09, $p < .01$) Regardless of the medium strong explanatory value on the dependent variable, the model could be improved to reach a better variance score.

To begin with, the variables “Scientific Worldview”, “Scientific Temper” and “Reputation of Scientific Institution” did have a positive significant effect on “Trust in Science”. The effect of “Scientific Temper” on “Trust in Science” was the strongest out of all significant effects, which is in line with the outcome of the correlation analysis and indicates that students who had a positive attitude towards science were also more likely to have trust in science. The same applies for the variable “Scientific Worldview”, which indicates that participants of the study were more likely to trust, when a scientific worldview was given. Additionally, due to the significant effect of “Reputation of Scientific Institution” on “Trust in Science”, participants indicated that if the reputation of a scientific institution, for instance, the University of Twente, is relatively positive, they are also more likely to trust in science.

When looking at the variable “Political Affiliation”, the single item question “What is your political affiliation?-liberal:conservative” had a significant negative effect, while the second single item question “What is your political affiliation?-left:right” did not have any significant effect on the dependent variable. Therefore, it can be said that the left or right orientation of a participant did not significantly influence the trust in science of the participants, while the liberal or conservative tendency did.

Furthermore, the variables “Scientific Literacy”, “Trust in Media” and “Religion” did not have any significant effect on the dependent variable, meaning that neither the scientific knowledge of a student, nor the religious commitment or the trust in media predicted participants' trust in science. Also, as it can be seen, most of the demographic variables (Gender, Age Groups, Nationality, Academic Year) did not have a significant effect on “Trust in Science”, meaning that the variables did not significantly predict “Trust in Science”. However, the demographic variable “Study Faculty” did explain the dependent variable

significantly, implying that the participants' study programme, which is connected to either a technical or non-technical faculty, effected the participants' trust in science.

Table 3
Regression Coefficients

Model	ß	t-value	Sig.
Scientific Worldview	.08	2.80	.01
Scientific Temper	.23	4.71	.01
Scientific Literacy	.05	1.06	.29
Trust in Media	.04	1.18	.24
Religion	-.05	-1.91	.06
Reputation of Scientific Institution	.16	3.24	.01
What is your political affiliation?-liberal:conservative	-.09	-2.30	.02
What is your political affiliation?-left:right	-.04	-.97	.33
Gender	-.04	-.71	.48
Age Groups	.02	.19	.85
Nationality	.06	1.68	.09
Study Faculty	.09	2.45	.02
Academic Year	.07	1.85	.07
	Model Summary		
R Square	.43		
F	14.09		
df	13		

Note: Scores represent unstandardized coefficients

4.4 Comparison between Technical Faculty and Non-technical faculty

As findings of the regression analysis on "Study Faculty"indicated effects on the trust level between social and technical students, it was of interest to see if other differences would appear when comparing both groups with each other. To compare social science students from the non-technical faculty with students from technical faculties on the given results, an independent samples t-test on the dependent as well as on the independent variables was conducted (see Table 4). Firstly, the participants studying a programme from a technical faculty (M=5.68, SD=.67) and participants studying a programme from a non-technical faculty (M=5.48, SD=.73) differed significantly in their trust in science, with students from a technical faculty having more trust in science then students from a non-technical faculty, *t* (255) = -2.21, p =.03. Secondly, there was a significant difference in "Scientific Literacy" between students from technical faculties (M=5.56, SD=.78) and students from non-technical faculties (M=5.10, SD=.90). As data displays, students from technical faculties scored higher on "Scientific Literacy" compared to students from the non-technical faculty *t* (255) = -4.23, p = .01. The same applies to "Political Affiliation", where students from a technical faculty (M=3.68, SD=1.24) scored significantly higher than the students from a non-technical study, when being asked about their left or right political tendency (M=2.95, SD=1.15); *t* (255) = -4.81, p = .01.

Table 4
Comparison between Technical Faculty and Non-technical Faculty students

	Technical Faculty		Non-technical Faculty			
	Mean	Std. Deviation	Mean	Std. Deviation	t-value	Sig.
Political Affiliation (left:right)	3.68	1.24	2.95	1.15	-4.81	.01
Political Affiliation	2.97	1.21	2.78	1.07	-1.32	.19

(liberal:conservative)						
Scientific Worldview	4.57	1.43	4.31	1.42	-1.48	.14
Scientific Temper	5.36	.94	5.37	.82	.09	.93
Scientific Literacy	5.56	.78	5.10	.90	-4.23	.01
Trust in Media	3.93	1.37	4.15	1.17	1.36	.18
Religion	3.01	1.76	2.78	1.53	1.11	.27
Reputation of Scientific Institution	5.51	.84	5.49	.71	-.24	.81
Trust in Science	5.68	.67	5.48	.73	-2.21	.03

4.5. Hypotheses Overview

From the results, Table 5 gives an overview of all hypotheses and whether they could be supported or not.

Table 5
Hypotheses with Support

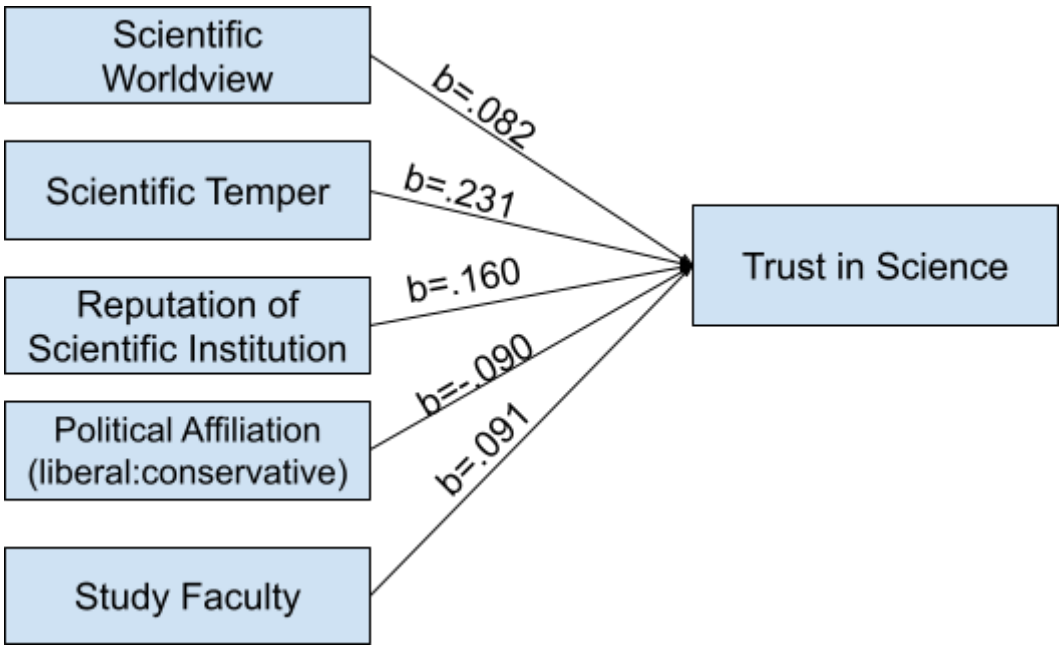
Hypotheses	Support
H1(a): A person's scientific worldview has a positive effect on trust in science.	Yes
H1(b): A person's scientific temper has a positive effect on trust in science.	Yes
H1(c): A person's scientific literacy has a positive effect on trust in science.	No
H2(a): A conservative political orientation has a negative effect on people's trust in science.	Yes
H2(b): A left-oriented political orientation has a positive effect on trust in scientific	No

information.	
H2: A religious commitment has a negative effect on trust in science.	No
H4: Trust in media has a positive effect on trust in science.	No
H5: Trust in scientists has a positive effect on trust in science.	No
H6: A positive reputation of a scientific institution has a positive effect on trust in science.	Yes
H7(a): Men have a higher level of trust in science compared to women.	No
H7(b): Age has a positive effect on trust in science.	No

4.6 Final Research Model

Based on the results, a final adjusted research model was created, which can be seen in figure 2.

Figure 2.
Final Research Model



5. Discussion

The main aim of this study was to identify what factors influence trust in science among students of the University of Twente. In addition, a comparison analysis was conducted to determine how technical and non-technical students differ in their trust in science, as well as in the given predictors. While the answer to both questions has been answered, it is interesting to discuss the details of the findings.

5.1 Main findings

Findings from this research suggest that the trust level in science is relatively high among the students, demonstrating that students do not only trust in science but also accept and support scientific findings. The regression analyses showed that "Scientific Worldview", "Scientific Temper", " Reputation of Scientific Institution", "Political affiliation" and the "Study Faculty" did have a significant influence on students' trust in science and therefore can be seen as factors shaping the trust of university students.

To begin with "Scientific Temper", the students showed a positive attitude towards science and were therefore more prone to have trust in science. This is in line with the findings of Gauchat (2011), who stated that scientific temper can influence a person's attitude towards scientific work. However, in the study of Snow and Dibner (2016) and in the paper of Miller (2004), it was stated that the concept of scientific temper would be closely related with the concept of scientific literacy. In this study, "Scientific Temper" and "Scientific Literacy" did not correlate with each other and therefore, the statement of the researchers cannot be confirmed.

Further, "Scientific Literacy" did not show any significant effect in the regression analysis, despite the findings of Kavner (2020), mentioning that there would be a relationship

between scientific literacy and a person's trust in science. Actually, the findings of this study towards “Scientific Literacy” belong to the minority, comparing them to other studies. For instance, earlier research of Bauer et al. (2007) explained that scientific literacy, also referred to as “scientific knowledge” became the leading explanatory factor when it comes to attitudes towards science. Since the factor of scientific literacy was perceived as greatly influential on the acceptance of science (Bauer et al., 2007), it is surprising that scientific literacy did not show any effects in this research model constellation. This might be due to the fact that both concepts of scientific temper and scientific literacy are closely related, so that the students of this study may not have made a distinction between the two concepts. Despite that, it could also be that the sample, including only students from the same university, created a biased outcome of responses in this case. Apparently, as further literature shows, an absence of knowledge about basic science facts and methods can lead to individuals retrogressing to anti-science or pre-modern worldviews. These “anti-science” worldviews are characterized by superstition, conspiracy and hostility towards science and scientists (Holton, 1993). In contrast to anti-science worldviews, are the findings of this research.

Previous literature stated that individuals with a higher scientistic worldview would have a higher tendency to give unconditional trust to scientific methods, due to individuals' perception of science as a source of hope (Jach, 2019). The findings of this research may not have confirmed the aspect of science being a source of hope for university students, but it can be confirmed that the scientific worldview of a person can be seen as an antecedent of trust in science. As research has demonstrated, the students of the University of Twente seem to have a high scientific worldview, which may be connected to the variable of “Scientific Temper”, as the correlation analysis of this research indicates that “Scientific Temper” and “Scientific Worldview” are strongly correlated with each other. Furthermore, this finding suggests that the University of Twente may have a great influence on the building of students' scientific

worldview, as the worldview of a person often gets greatly affected by external factors like social environment and education (Vidal, 2008).

"Reputation of Scientific Institution" is another important antecedent of "Trust in Science". As Ganesan (1994) expressed, the reputation of an institution is positively related to trust. Due to the significant effect of "Reputation of Scientific Institution" on "Trust in Science", this study confirms this finding and shows that the reputation applies to the level of trust in science of a person.

An unexpected finding was the effect of the demographic variable "Study Faculty" on "Trust in Science". Therefore, "Study Faculty" is found to be another antecedent of trust in science. As this research shows, the students' study programme, which is connected to either a technical or non-technical faculty, affects the students' trust in science. According to literature, it appears that the academic surroundings of a student can influence the students behaviour in a certain amount (Biggs, 1970). Therefore, it can be assumed that the surroundings of a student, in this case the study faculty, influenced a students behaviour in relation to trust in science. Due to this outcome, it was decided to conduct a comparison analysis, to see if multiple differences exist between both student groups.

Lastly, the single item of "Political affiliation" asking about the liberal and conservative tendency of a person had the only negative effect in "Trust in Science", which displays that if the conservative political tendency of a student increases, the trust level of that person towards science decreases. This is in line with the findings of Brewer and Ley (2012), stating that the affiliation to specific political parties has an effect on trust in scientists and therefore also in science itself. The findings of this research confirm earlier studies, by displaying that the tendency towards liberal or conservative politics is of great importance. Furthermore, as this single item correlates with the variable "Religion", it can be assumed that students of the university who are politically on the conservative side, tend to be more faithful

in a specific religion. This in turn could be another reason why those students may have skepticism in science, as religion tends to have the ability to dampen peoples views on scientific topics, as previous literature stated (Allum et al., 2014; Scheufele et al., 2009). However, this research cannot confirm this statement.

"Scientific Literacy", "Trust in Media" and "Religion" did not show any impact on the dependent variable. Besides that, also the demographic variables like "Gender", "Nationality", " Academic year" did not display any significant influence on "Trust in Science". In the case of "Religion", it is surprising that this construct did not show any remarkable effect. As previous research had stated, religious beliefs were associated with less supportive attitudes towards science (Brewer & Ley, 2013) and according to Scheufele et al. (2003), it was seen that people attending religious services more often, had a higher chance to be exposed to cues from religious leaders, leading to mistrust in science. Even previous literature of Brewer and Ley (2013) demonstrated that religious services can shape the trust in sources of scientific information. Hence, the variable "Religion" was expected to be an antecedent of great influence in regards to a person's trust level in science. Due to the findings of this research, it can be suggested that the students of the University of Twente are , on average, less likely to attend religious services and therefore, do not have a high belief in religion. On the contrary, it could be assumed that the students participating in this study may not have felt comfortable to open up on their religious beliefs, as religion can be perceived as an intimate topic (Rippy & Newman, 2006).

The same surprising effect of "Scientific Literacy" and "Religion" does apply to the variable of "Trust in Media" which was stated in various articles to have an effect on trust in science and in the acceptance of science. Nevertheless, the surprising result of "Trust in Media" not having an impact is arguable, as previous literature indicated large findings of literature researching the relationship between media usage and acceptance of science, but

less on the concept of trust in media and its effect on trust in science. However, a possible explanation could be that the questions regarding “Trust in Media” were not specific enough to the sample of students.

In regards to the demographic variables, “Gender” and “Age”, an explanation for no effect could be an uneven representation of demographics in this research sample, leading to a possibility of biased results.

5.2 Comparison between Technical and Non-technical students

The comparison analysis between the technical faculty and the non-technical faculty revealed certain differences. Firstly, it can be said that the trust in science was higher among technical students from a technical faculty, compared to the social students from the non-technical faculty group. This might be explained by the fact that most technical students have a rather STEM-based background in their study program compared to the social science students (University of Twente, 2021). Furthermore, a difference in the students' scientific literacy was found. Here, technical students score higher in comparison to social science students. This means that on average, technical students had the opinion of being quite scientific literate, while social students have classified themselves as not as knowledgeable about science. It could be suggested social science students may be more critical with themselves in this sense and therefore scored lower. However, other reasons for the significant differences between both groups could be internal factors like uneven gender distributions and the possibility of differences in the representation of age groups. For instance, this sample implied more male students in the technical studies compared to the sample of the social studies, where women were overrepresented. As previous literature showed, men perceive themselves to be more knowledgeable about science compared to women (Scarfuto, 2020). Therefore, it is arguable if the difference between the both faculties derive from a higher representation of male students in the technical faculty. Furthermore, the technical studies had a higher age

distribution, which may be explained by the fact that technical education often has a duration of four years in the bachelor programme and two years in the master programme, while social studies mostly takes three years for a bachelor degree and one year for a masters degree. However, as useful as it might be to draw attention to such differences, it is important to highlight that, given the effect sizes found, the differences are actually rather small.

Lastly, there was a small difference between both groups in their political affiliation. As it can be seen, technical students indicated to be more right oriented, compared to the social science students. This in turn may be explained again by the higher representation of males in the technical faculties. According to Plumb (2016), women are more keen to follow liberal parties, as those often follow the approach to foster the goal of gender equality, while a right political tendency is often connected with a more conservative approach towards women. Therefore, due to the fact that males are overrepresented in the technical faculty sample, this may have led to a higher possibility of having more persons with a right political tendency in the sample. However, it is important to emphasize that the findings show that technical students may have intended to have a more right political leaning in this sample, nevertheless, this tendency did not go to extremes.

5.3 Theoretical and practical implications

Based on the results of this study, theoretical and practical implications are distinguished. First, it has to be mentioned that there is various existing literature on trust in science and predictors of trust. Moreover, several research was conducted in the past about trust and its influence on the acceptance of scientific topics, such as climate change, nanobiology or vaccines. However, so far, there could not be found any research about trust in science and its antecedents conducted in the scientific community and with the focus on university students. Therefore, it was important to conduct this research, to be able to see what actually predicts trust in science within the scientific community. As this research found a new antecedent of

trust in science, which is namely the study faculty of the students, it offers a new perspective on the elements of trust. Therefore, from a theoretical perspective, this study was able to marginally fill in the current deficiency in the knowledge of predictors of trust in science in regards to university students. From a practical perspective, the insights resulting from this research can be used for new approaches in the communication of science. However, since this study is the first one researching this matter, it is advisable to conduct further research, to get more reliable results.

5.4 Limitations and future research

This research, however, does have some limitations. Firstly, a high number of participants did not finish to fill out the survey. This may be explained by the fact that some respondents either did not understand the items of the survey, or the survey was taking too much time. Another possibility could be that the participants did not click on the last button of the questionnaire, ensuring that the data is saved as a complete response.

Secondly, another limitation concerns the sampling method of this research.The downside of the combination of convenience and snowball sampling is that most participants are personally known, or in the same societal bubble. This can result in one-sided results and therefore to a non-representative data. Furthermore, the application process did limit the participants only in the matter of being a current student at the University of Twente, which may also have led to bias in the sample. Hence, drawing samples from students of different universities could be taken into consideration for future research.

Thirdly, having a sample size of 255 participants, the size could be increased in future research to ensure reliability, since the sample was divided into two different groups due to the comparison analysis. This had the cause that the sample size per group automatically decreased. In addition to that, the questionnaire was distributed only in English language, which could have led to the fact that participants, not being a native english speaker, had

troubles in understanding the survey. Even if the chance is quite low and probably most students did understand the survey and were able to translate the items correctly, the probability of misinterpretation can never be excluded entirely.

Lastly, the concepts of scientific literacy and scientific temper seem to appear very similar in the questionnaire for the participants. A reason could be that the questions sounded too similar to the participants and therefore were not distinguished properly. This indicates that the two concepts could be transformed into one construct in future research.

5.5. Conclusion

The study aimed to identify what factors influence trust in science among students of the University of Twente. In addition, after findings of the regression analysis on "Study Faculty"indicated effects on trust, a comparison analysis was conducted with the aim to see if technical and non-technical students differ from each other. To conclude, it can be said that students of the University of Twente do have a high trust in science. Furthermore, different antecedents of trust in science were able to be distinguished. Those are as follows: Scientific Worldview, Scientific Temper, Reputation of Scientific Institution and Political Affiliation. In the end, this research was able to find another antecedent of trust in science, namely the Study Faculty. Still, further research has to be conducted to explore and ensure the newly found antecedent.

References

Achterberg, P., De Koster, W., & Van der Waal, J. (2017). A science confidence gap: Education, trust in scientific methods, and trust in scientific institutions in the United States, 2014. *Public Understanding of Science*, *26*(6), 704-720. DOI:10.1177/0963662515617367

Anderson AA, Scheufele DA, Brossard D and Corley EA (2011) The role of media and deference to scientific authority in cultivating trust in sources of information about emerging technologies. *International Journal of Public Opinion Research*. Epub ahead of print 25 August 2011. DOI: 10.1093/ijpor/edr032.

Arseculeratne, S. N. (2014). The scientific attitude (the scientific temper) in Eastern and Western societies. *Anuradhapura Medical Journal*, *8*(1). DOI:10.4038/amj.v8i1.6757

Allum, N., Sibley, E., Sturgis, P., & Stoneman, P. (2014). Religious beliefs, knowledge about science and attitudes towards medical genetics. *Public Understanding of Science*, *23*(7), 833-849. DOI:10.1177/0963662513492485

Babbie, E.R. (1998). *The practice of social research* (14th ed.). Belmont, CA: Wadsworth publishing company.

Bak, H. J. (2001). Education and public attitudes toward science: Implications for the "deficit model" of education and support for science and technology. *Social Science Quarterly*, *82*(4), 779-795. DOI: 10.1111/0038-4941.00059

Barke, R. P., Jenkins-Smith, H., & Slovic, P. (1997). Risk perceptions of men and women scientists. *Social Science Quarterly*, 167-176. Retrieved from: https://www.jstor.org/stable/42863683?seq=1#metadata_info_tab_contents

Barley, S. R. (1988). The social construction of a machine: Ritual, superstition, magical thinking and other pragmatic responses to running a CT scanner. In *Biomedicine examined* (pp. 497-539). Springer, Dordrecht. DOI:10.1007/978-94-009-2725-4_19

Bauer, M. W., Allum, N., & Miller, S. (2007). What can we learn from 25 years of PUS survey research? Liberating and expanding the agenda. *Public understanding of science*, *16*(1), 79-95. DOI: 10.1177/0963662506071287

Biernacki, P., & Waldorf, D. (1981). Snowball sampling: Problems and techniques of chain referral sampling. *Sociological methods & research*, *10*(2), 141-163. DOI: 10.1177/004912418101000205

Biggs, J. B. (1970). Faculty patterns in study behaviour*. Australian Journal of Psychology, 22(2), 161–174. DOI:10.1080/00049537008254570

Brammer, S. J., & Pavelin, S. (2006). Corporate reputation and social performance: The importance of fit. *Journal of management studies*, *43*(3), 435-455. DOI: 10.1111/j.1467-6486.2006.00597.x

Brewer, P. R., & Ley, B. L. (2013). Whose science do you believe? Explaining trust in sources of scientific information about the environment. *Science Communication*, *35*(1), 115-137. DOI:10.1177/1075547012441691

Broks, P., Gascoigne, T., Leach, J., Lewenstein, B. V., Massarani, L., Riedlinger, M., & Schiele, B. (2020). *Communicating Science: A Global Perspective* (p. 994). ANU Press. DOI:10.22459/CS.2020

Cacciatore, M. A., Scheufele, D. A., & Corley, E. A. (2014). Another (methodological) look at knowledge gaps and the Internet's potential for closing them. *Public Understanding of Science*, *23*(4), 376-394. DOI: 10.1177/0963662512447606

Castell, S., Charlton, A., Clemence, M., Pettigrew, N., Pope, S., Quigley, A., ... & Silman, T. (2014). Public attitudes to science 2014. *London, Ipsos MORI Social Research Institute*, *194*, 28. Retrieved from: https://www.ipsos.com/sites/default/files/migrations/en-uk/files/Assets/Docs/Polls/pas-2014-main-report-accessible.pdf

Chryssochoidis G, Strada A and Krystallis A (2009) Public trust in institutions and information sources regarding risk management and communication: Towards integrating extant knowledge. *Journal of Risk Research* 12(2): 137–185. DOI: 10.1080/13669870802637000

Cheikh, A.B., Abdellatif, T., & Bakini, F. (2014). The social acceptance of renewable energy: An approach based customer orientation. SSRN Electronic Journal. DOI:10.2139/ssrn.2583515

Dagnall, N., Denovan, A., Drinkwater, K. G., & Parker, A. (2019). An evaluation of the belief in science scale. *Frontiers in psychology*, *10*, 861. DOI:10.3389/fpsyg.2019.00861

Dudo, A., Brossard, D., Shanahan, J., Scheufele, D. A., Morgan, M., & Signorielli, N. (2011). Science on television in the 21st century: Recent trends in portrayals and their contributions to public attitudes toward science. *Communication Research*, *38*(6), 754-777. DOI:10.1177/0093650210384988

European Social Survey, (2010). ESS Round 5 Source Questionnaire. London: Centre for Comparative Social Surveys, City University London. Retrieved from: http://www.europeansocialsurvey.org/docs/round5/fieldwork/source/ESS5_source_main_questionnaire.pdf

Feinstein, Noah. "Salvaging science literacy." *Science education* 95.1 (2011): 168-185. DOI:10.1002/sce.20414.

Fiske, S. T., & Taylor, S. E. (1991). *Social cognition*. Mcgraw-Hill Book Company. Retrieved from: https://psycnet.apa.org/record/1991-97723-000

Fombrun, C., & Shanley, M. (1990). What's in a name? Reputation building and corporate strategy. *Academy of management Journal*, *33*(2), 233-258. DOI: 10.5465/256324

Fox, M. F., & Firebaugh, G. (1992). Confidence in science: The gender gap. *Social Science Quarterly*. Retrieved from: https://eric.ed.gov/?id=EJ456462

Funk.C. (2020, September 29) *Science and Scientists Held in High Esteem Across Global Publics* PewResearchCenter https://www.pewresearch.org/science/2020/09/29/science-and-scientists-held-in-high-esteem-across-global-publics/

Ganesan, S. (1994). Determinants of long-term orientation in buyer-seller relationships. *Journal of marketing*, *58*(2), 1-19. DOI:10.1177/002224299405800201

Gaskell, G., Einsiedel, E., Hallman, W., Priest, S. H., Jackson, J., & Olsthoorn, J. (2005). Social values and the governance of science. *Science*, *310*(5756), 1908-1909. DOI:0.1126/science.1119444

Gauchat, G. (2011). The cultural authority of science: Public trust and acceptance of organized science. *Public understanding of science*, *20*(6), 751-770. DOI:10.1177/0963662510365246

Gerbner, G. (1987). Science on television: How it affects public conceptions. *Issues in Science and Technology*, *3*(3), 109-115. Retrieved from: https://www.jstor.org/stable/43309074?seq=1#metadata_info_tab_contents

Hayes, B. C., & Tariq, V. N. (2000). Gender differences in scientific knowledge and attitudes toward science: A comparative study of four Anglo-American nations. *Public Understanding of Science*. DOI:10.1088/0963-6625/9/4/306

Hendriks, F., Kienhues, D., & Bromme, R. (2016). Trust in science and the science of trust. In *Trust and communication in a digitized world* (pp. 143-159). Springer, Cham. DOI:10.1007/978-3-319-28059-2_8

Hmielowski, J. D., Feldman, L., Myers, T. A., Leiserowitz, A., & Maibach, E. (2014). An attack on science? Media use, trust in scientists, and perceptions of global warming. *Public Understanding of Science*, *23*(7), 866-883. DOI:10.1177/0963662513480091

Hoff, K. A., and Bashir, M., 2015, "Trust in Automation: Integrating Empirical Evidence on Factors That Influence Trust," *Hum. Factors*, 57(3), pp. 407–434. DOI:10.1177/0018720814547570

Holton, G. J. (1993). *Science and anti-science*. Harvard University Press. Retrieved from: https://books.google.nl/books?hl=en&lr=&id=7JiHiUHrsgsC&oi=fnd&pg=PP17&dq=Holton,+G.+J.+(1993).+Science+and+anti-science.+Harvard+University+Press.&ots=vNORbuDOw7&sig=tLWc-M1yCxx2doNqcgclJqUmo64&redir_esc=y#v=onepage&q&f=false

Huber, B., Barnidge, M., Gil de Zúñiga, H., & Liu, J. (2019). Fostering public trust in science: The role of social media. *Public understanding of science*, *28*(7), 759-777. DOI:10.1177/0963662519869097

Huber, S., & Huber, O. W. (2012). The centrality of religiosity scale (CRS). *Religions*, *3*(3), 710-724. DOI:10.3390/rel3030710

Ipsos MORI (2011) Politicians trusted less than estate agents, bankers and journalists [online]. Retrieved from: http://www.ipsos-mori.com/researchpublications/researcharchive/3133/Politicians-trusted-less-than-estate-agents-bankers-and-journalists.aspx>

Jach, Ł. (2019). Spotlight on scientotheism. Structure and psychometric properties of the questionnaire for the study of scientistic worldview aspects. The Review of Psychology, 62, 141–165. DOI:10.511/cipp.2021.104596

Kavner, A. (2020). *Development of a Psychophysiological Artificial Neural Network to Measure Science Literacy* (Doctoral dissertation, State University of New York at Buffalo). Retrieved from: https://www.proquest.com/openview/8d9dcf4ab377c1853ed17026e31e46fd/1?pq-origsite=gscholar&cbl=51922&diss=y

Keh, H. T., & Xie, Y. (2009). Corporate reputation and customer behavioral intentions: The roles of trust, identification and commitment. *Industrial marketing management*, *38*(7), 732-742. DOI:10.1016/j.indmarman.2008.02.005

Krosnick, J. A., & MacInnis, B. (2010). Frequent viewers of Fox News are less likely to accept scientists' views of global warming. *Report for The Woods Institute for the Environment.* Retrieved from: *http://woods. stanford. edu/docs/surveys/Global-Warming-Fox-News. Pdf*.

Knight, A. J. (2005). Differential effects of perceived and objective knowledge measures on perceptions of biotechnology. Retrieved from: https://mospace.umsystem.edu/xmlui/bitstream/handle/10355/102/Differential%20effects%20of%20perceived%20and%20objective%20knowledge.pdf?sequence=1

Leiserowitz, A., Smith, N., & Marlon, J. R. (2010). American teens' knowledge of climate change. *Yale University. New Haven, CT: Yale Project on Climate Change Communication*, *5*. Retrieved from: http://www.ourenergypolicy.org/wp-content/uploads/2013/05/American-Teens-Knowledge-of-Climate-Change.pdf

Liu, H., & Priest, S. (2009). Understanding public support for stem cell research: media communication, interpersonal communication and trust in key actors. *Public Understanding of science*, *18*(6), 704-718. DOI: 10.1177/0963662508097625

Luján, J. L., & Todt, O. (2007). Precaution in public: the social perception of the role of science and values in policy making. *Public Understanding of Science*, *16*(1), 97-109. DOI:10.1177/0963662506062467

Mann, M., & Schleifer, C. (2020). Love the Science, Hate the Scientists: Conservative Identity Protects Belief in Science and Undermines Trust in Scientists. *Social Forces*, *99*(1), 305-332. DOI:10.1093/sf/soz156

Miller, J. D. (1998). The measurement of civic scientific literacy. *Public understanding of science*, *7*, 203-223. DOI:10.1088/0963-6625/7/3/001

Miller, J. D. (2004). Public understanding of, and attitudes toward, scientific research: What we know and what we need to know. *Public understanding of science*, *13*(3), 273-294. DOI: 10.1177/0963662504044908

Mercer-Mapstone, L., Rifkin, W., Louis, W. R., & Moffat, K. (2018). Company-community dialogue builds relationships, fairness, and trust leading to social acceptance of Australian mining developments. *Journal of cleaner production*, *184*, 671-677. DOI:10.1016/j.jclepro.2018.02.291

Munhall, P. L. (1989). Ethical considerations in qualitative research. *Western Journal of Nursing Research, 10,* 150–162. DOI:10.1177/089431848900200109

Myers, T. A., Kotcher, J., Stenhouse, N., Anderson, A. A., Maibach, E., Beall, L., & Leiserowitz, A. (2017). Predictors of trust in the general science and climate science research of US federal agencies. *Public Understanding of Science*, *26*(7), 843-860. DOI:10.1177/0963662516636040

Nadelson, L., Jorcyk, C., Yang, D., Jarratt Smith, M., Matson, S., Cornell, K., & Husting, V. (2014). I just don't trust them: the development and validation of an assessment instrument to measure trust in science and scientists. *School Science and Mathematics*, *114*(2), 76-86. DOI:10.1111/ssm.12051

Nadelson, L. S., & Hardy, K. K. (2015). Trust in science and scientists and the acceptance of evolution. *Evolution: Education and Outreach*, *8*(1), 1-9. Retrieved from: https://evolution-outreach.biomedcentral.com/articles/10.1186/s12052-015-0037-4

Nisbet, M. C., Scheufele, D. A., Shanahan, J., Moy, P., Brossard, D., & Lewenstein, B. V. (2002). Knowledge, reservations, or promise? A media effects model for public perceptions of science and technology. *Communication Research*, *29*(5), 584-608. DOI:10.1177/009365002236196

Nisbet, M. C., & Goidel, R. K. (2007). Understanding citizen perceptions of science controversy: bridging the ethnographic—survey research divide. *Public Understanding of science*, *16*(4), 421-440. DOI:10.1177/0963662506065558

Nisbet MC and Myers T (2007) The polls- Trends: Twenty years of public opinion about global warming. *Public Opinion Quarterly* 71(3): 444–470. DOI:10.1093/poq/nfm031

Panacek, E. A., & Thompson, C. B. (2007). Sampling methods: selecting your subjects. *Air Medical Journal*, *26*(2), 75-78. DOI:10.1016/j.amj.2007.01.001

Brewer, P. R., & Ley, B. L. (2013). Whose science do you believe? Explaining trust in sources of scientific information about the environment. *Science Communication*, *35*(1), 115-137. DOI: 10.1177/1075547012441691

Pifer, L. K. (1996). Exploring the gender gap in young adults' attitudes about animal research. *Society & Animals*, *4*(1), 37-52. DOI:10.1163/156853096X00034

Plumb, A. (2016). The substantive representation of women on 'morality politics' issues in Australia and the UK: How does the substantive representation of women occur in conservative parties?. *Political Science*, *68*(1), 22-35. DOI: 10.1177/0032318716647208

Rippy, A. E., & Newman, E. (2006). Perceived religious discrimination and its relationship to anxiety and paranoia among Muslim Americans. *Journal of Muslim Mental Health*, *1*(1), 5-20. DOI:10.1080/15564900600654351

Rutjens, B. T., Sutton, R. M., & van der Lee, R. (2018). Not all skepticism is equal: Exploring the ideological antecedents of science acceptance and rejection. *Personality and Social Psychology Bulletin*, *44*(3), 384-405. DOI:10.1177/0146167217741314

Shermer, M. (2002). *Why people believe weird things: Pseudoscience, superstition, and other confusions of our time*. Macmillan. Retrieved from:

https://acindustrialtech.com.ph/sites/default/files/webform/why-people-believe-weird-things-pseudoscience-superstition-and-michael-shermer-stephen-jay-gould-pdf-download-free-book-30195be.pdf

Scarfuto, J. (2020, February 16). *Do you trust science? These five factors play a big role* https://www.sciencemag.org/news/2020/02/do-you-trust-science-these-five-factors-play-big-role

Scheufele, D. A., & Lewenstein, B. V. (2005). The public and nanotechnology: How citizens make sense of emerging technologies. *Journal of Nanoparticle Research*, *7*(6), 659-667. Retrieved from: https://link.springer.com/article/10.1007/s11051-005-7526-2

Scheufele, D. A., Corley, E. A., Shih, T. J., Dalrymple, K. E., & Ho, S. S. (2009). Religious beliefs and public attitudes toward nanotechnology in Europe and the United States. *Nature nanotechnology*, *4*(2), 91-94. Retrieved from: https://www.nature.com/articles/nnano.2008.361

Schranz, M., Schneider, J., & Eisenegger, M. (2018). Media trust and media use. In Trust in Media and Journalism (pp. 73-91). Springer VS, Wiesbaden. DOI: 10.1007/978-3-658-20765-6_1

She, J., Neuhoff, J., & Yuan, Q. (2021). Shaping Pedestrians' Trust in Autonomous Vehicles: An Effect of Communication Style, Speed Information, and Adaptive Strategy. *Journal of Mechanical Design*, *143*(9), 091401. DOI: 10.1115/1.4049866

Siegrist M and Cvetkovich G (2000) Perception of hazards: The role of social trust and knowledge. *Risk Analysis* 20(5): 713–720. DOI: 10.1111/0272–4332.205064.

Siltaoja, M. E. (2006). Value priorities as combining core factors between CSR and reputation–a qualitative study. *Journal of Business Ethics*, *68*(1), 91-111. Retrieved from:https://link.springer.com/article/10.1007/s10551-006-9042-4

Su, L. Y. F., Akin, H., Brossard, D., Scheufele, D. A., & Xenos, M. A. (2015). Science news consumption patterns and their implications for public understanding of science. *Journalism & Mass Communication Quarterly*, *92*(3), 597-616. DOI:10.1177/1077699015586415

Swift, A. (2017). In US, belief in creationist view of humans at new low. *Gallup News* Retrieved from: *https://news. gallup. com/poll/210956/belief-creationist-view-humans-new-low. Aspx*.

University of Twente *(2021,July) Bachelors of the University of Twente https://www.utwente.nl/en/education/bachelor/*

Van den Berg, S. M., & van der Kolk, H. (2014). Data collection and scale development. London, UK: SAGE.

Vidal, C. (2008). What is a worldview?. In De wetenschappen en het creatieve aspect van de werkelijkheid. Retrieved from: http://cogprints.org/6094/2/Vidal_2008-what-is-a-worldview.pdf

von Roten, F. C. (2004). Gender differences in attitudes toward science in Switzerland. *Public Understanding of Science*, *13*(2), 191-199. DOI:10.1177/0963662504043870

Wang, Y., & Vassileva, J. (2003, September). Trust and reputation model in peer-to-peer networks. In *Proceedings Third International Conference on Peer-to-Peer Computing (P2P2003)* (pp. 150-157). IEEE. DOI: 10.1109/PTP.2003.1231515

Weingart, P., & Guenther, L. (2016). Science communication and the issue of trust. *Journal of Science communication*, *15*(5), 1-11. Retrieved from: https://pdfs.semanticscholar.org/a71c/528c24a785b072d14f6cf206ef1d17ba4200.pdf

Weiss, A. M., Anderson, E., & Maclnnis, D. J. (1999). Reputation management as a motivation for sales structure decisions. *Journal of Marketing*, *63*(4), 74-89. DOI:10.1177/002224299906300407

Weisberg, D. S., Landrum, A. R., Metz, S. E., & Weisberg, M. (2018). No missing link: Knowledge predicts acceptance of evolution in the United States. *BioScience*, *68*(3), 212-222. DOI:10.1093/biosci/bix161

Weisberg, D. S., Landrum, A. R., Hamilton, J., & Weisberg, M. (2021). Knowledge about the nature of science increases public acceptance of science regardless of identity factors. *Public Understanding of Science*, *30*(2), 120-138. DOI:10.1177/0963662520977700

Wüstenhagen, R., Wolsink, M., & Bürer, M. J. (2007). Social acceptance of renewable energy innovation: An introduction to the concept. *Energy policy*, *35*(5), 2683-2691. DOI:0.1016/j.enpol.2006.12.001

Yoon, Y., Gürhan‐Canli, Z., & Schwarz, N. (2006). The effect of corporate social responsibility (CSR) activities on companies with bad reputations. *Journal of consumer psychology*, *16*(4), 377-390. DOI:10.1207/s15327663jcp1604_9

Appendix A - Questionnaire Items

Questionnaire

Variable	Items
Demographics	Are you a student of the University of Twente?
	What is your age?
	What is your gender?
	In which study program are you involved?
	In which academic year of your study program are you in?
	What is your nationality?
Political Affiliation	What is your political affiliation?
Scientific Worldview	I think that only science explains the world around us.
	The scientific method is the only reliable path to knowledge.
	All the tasks human beings face can be solved by science.
	I would identify myself as a part of the scientific community.
Scientific Temper	I think that scientific theories are effective to explain the world around us.
	On balance, the benefits of scientific research outweigh the risks.
	Human problems can be understood and solved through the application of scientific methods.
	In general, I have a positive attitude towards science.
Scientific Literacy	I understand the impacts of science.
	I keep myself informed about scientific developments.
	I would describe myself as being experienced with science related topics.
	I would describe myself as being knowledgeable about science.
Trust in Media	I perceive newspapers as a trustworthy source.
	I perceive news from national broadcasting companies as a trustworthy source.

	I perceive news from mainstream media as a trustworthy source.
	I perceive alternative news on social media as a trustworthy source.
Religion	I have a high level of religious commitment.
	I would describe myself as being active in religious services.
	I believe that a higher power exists.
	I would describe myself as a religious person.
Trust in Scientists	I think scientists are honest when carrying out their work.
	When scientists change their opinion on a scientific idea it diminishes the trust I have in their work.
	When scientists form a hypothesis, they are just guessing.
	Scientists will protect each other even when they are wrong.
Reputation of Scientific Institution	I think that the University of Twente carries out its work regarding scientific research successfully and well.
	I think that the University of Twente acts in the best interest of society.
	I would describe the researchers' work at the University of Twente as innovative.
	I think that the University of Twente has a good reputation among students.
Trust in Science	I trust science to make life better for people.
	Scientific theories are trustworthy.
	We can trust science to find the answers that explain the natural world.
	All things considered, science can be trusted.

Appendix B- Validity factor analysis

Validity factor analysis

Items	1	2	3	4	5	6	7	8
Factor 1: Scientific Worldview								
I think that only science explains the world around us.						.82		
The scientific method is the only reliable path to knowledge.						.79		
All the tasks human beings face can be solved by science.						.72		.32
I would identify myself as a part of the scientific community.		.51	.31					
Factor 2: Scientific Temper								
I think that scientific theories are effective to explain the world around us.						.35		.48
On balance, the benefits of scientific research outweigh the risks.								.63
Human problems can be understood and solved through the application of scientific methods.								.71
In general, I have a positive attitude towards science.			.56				-.327	
Factor 3: Scientific								

Literacy				
I understand the impacts of science.	.57			
I keep myself informed about scientific developments.	.81			
I would describe myself as being experienced with science related topics.	.85			
I would describe myself as being knowledgeable about science.	.88			
Factor 4: Trust in Media				
I perceive newspapers as a trustworthy source.		.86		
I perceive news from national broadcasting companies as a trustworthy source.		.86		
I perceive news from mainstream media as a trustworthy source.		.81		
I perceive alternative news on social media as a trustworthy source.				.731
Factor 5: Religion				
I have a high level of religious commitment.	.93			
I would describe myself as being active in religious	.89			

services.				
I believe that a higher power exists.	.77			
I would describe myself as a religious person.	.93			
Factor 6: Trust in Scientists				
I think scientists are honest when carrying out their work.		.49		.39
When scientists change their opinion on a scientific idea it diminishes the trust I have in their work.			.59	
When scientists form a hypothesis they are just guessing.			.55	
Scientists will protect each other even when they are wrong.			.68	
Factor 7: Reputation of Scientific Institution				
I think that the University of Twente carries out its work regarding scientific research successfully and well.		.76		
I think that the University of Twente acts in the best interest of		.76		

society.			
I would describe the researchers' work at the University of Twente as innovative.		.71	
I think that the University of Twente has a good reputation among students.		.76	
Factor 8: Trust in Science			
I trust science to make life better for people.	.64		
Scientific theories are trustworthy.	.72		
We can trust science to find the answers that explain the natural world.	.61	.34	
All things considered, science can be trusted.	.74		

Appendix C- Overview Cronbach Alpha

Cronbach's Alpha

Constructs	Items	Cronbach's Alpha
Scientific Worldview	I think that only science explains the world around us.	.82
	The scientific method is the only reliable path to knowledge.	

	All the tasks human beings face can be solved by science.	
Scientific Temper	I think that scientific theories are effective to explain the world around us.	.65
	On balance, the benefits of scientific research outweigh the risks.	
	Human problems can be understood and solved through the application of scientific methods.	
Scientific Literacy	I understand the impact of science.	.82
	I keep myself informed about scientific developments.	
	I would describe myself as being experienced with science related topics.	
	I would describe myself as being knowledgeable about science.	
Trust in Media	I perceive newspapers as a trustworthy source.	.85
	I perceive news from national broadcasting companies as a trustworthy source“.	
	I perceive news from a mainstream media as a trustworthy source.	
Religion	I have a high level of religious commitment.	.92
	I would describe myself as being active in religious services.	
	I believe that a higher power exists.	
	I would describe myself as a religious person.	
Trust in Scientists	When scientists change their opinion on a scientific idea it diminishes the trust I have in their	.56

	work.	
	When scientists form a hypothesis they are just guessing.	
	Scientists will protect each other even when they are wrong.	
Reputation of Scientific institution	I think that the University of Twente carries out its work regarding scientific research successfully and well.	.77
	I think that the university of Twente acts in the best interest of society.	
	I would describe the researchers' work at the University of Twente as innovative.	
	I think that the University of Twente has a good reputation among students.	
Trust in Science	I trust science to make life better for people	.75
	Scientific theories are trustworthy.	
	We can trust science to find the answers that explain the natural world.	
	All things considered, science can be trusted.	

Appendix D- Pearson Correlation

Table 3
Pearson Correlation

	Trust in Science	Scientific Worldview	Scientific Temper	Scientific Literacy	Trust in Media	Religion	Reputation of Scientific Institution	Political Affiliation (left:right)	Political Affiliation (liberal:conservative)	What is your gender?	Age Groups

Trust in Science	1										
Scientific Worldview	.40**	1									
Scientific Temper	.51**	.45**	1								
Scientific Literacy	.28**	.20**	.29**	1							
Trust in Media	.17**	.07	.12	.03	1						
Religion	-.33**	-.39**	-.30**	-.12*	-.13*	1					
Reputation of Scientific Institution	.34**	.19**	.25**	.23**	.17**	-.11	1				
Political Affiliation (left:right)	-.16*	-.03	-.14*	.09	-.306**	.11	-.06	1			
Political Affiliation (liberal:conservative)	-.31**	-.08	-.27**	-.06	-.25**	.30**	-.06	.53**	1		
What is your gender?	-.11	-.07	-.19**	-.19**	-.02	.02	-.05	-.29**	-.19**	1	
Age Groups	.03	-.09	-.03	.03	-.07	.08	.07	.06	.12	-.11	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).