

The origins and consequences of flight shame in the Netherlands



Bachelors thesis: Gijs Timmerman (S3770028)

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Colophon

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Author: Gijs Timmerman

Student number: S3770028

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Supervisors: Tess Osborne & Tom Lowe

Contact: g.timmerman@student.rug.nl

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Abstract:

Flight shame is a relatively new concept in the academic field, only existing since 2016. In recent research, flight shame was named the biggest threat to aviation. However, studies on flight shame have focussed on Scandinavia and Germany, leaving the Netherlands unresearched. Therefore, this thesis focuses the question: To what extent do Dutch people feel ashamed of flying and how do these feelings of flight shame arise and alter flying habits? To answer this question, a quantitative research using a survey was conducted. In order to answer the main research question, a regression was conducted in order to establish the origins of flight shame. It was established that people who felt more aware of the effects of aviation on the environment, were also more likely to establish more prominent feelings of flight shame. In addition, individual's reasons for feeling or not feeling flight shame were investigated. It was found that the vast majority of respondents justified not feeling flight shame because they saw flying as necessary, another prominent result was that individuals rarely made use of airplanes and this made them not feel flight shame. Lastly, this research looked into the flying habits of Dutch people and whether or not people that experienced flight shame, changed their flying habits as a result. It was found that a majority, 34%, of people that did experience flight shame did not change their flying habits versus 21% of people that did change their flying habits as a result of flight shame. In conclusion: Feelings of flight shame in Dutch people are likely to arise when an individual is more aware of the effects flying has on the environment, but feelings of flight shame do not always cause an individual to change their flying habits.

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1 Introduction

1.1 Introduction to flight shame and problem statement

“Flight shame” refers to an individual's uneasiness over engaging in consumption that is energy-intensive and climatically problematic. (Gössling, 2019, p. 1)

Climate change has been the most discussed environmental problem of the last ten years (Jakučionytė-Skodienė and Liobikienė, 2021). In Europe, a lot of research has been done into the field of climate change awareness and the degree to which the general public is concerned with climate change. Some researchers even go as far as to say that public climate change concern is the most important driver of climate change policies (Burke et al., 2018). However, until recently, there has not been enough research into the public's personal feelings about climate change and the ways individuals go about changing their behaviour. In this research, a well-known yet relatively recent feeling individuals seem to experience, “flight shame” is explored.

According to Gössling et al. (2020), the criticism of aviation and its climate-intensive nature led to feelings of Flygskam (Swedish for flight shame). Flight shame is a term that relates to an individual and it comes from a sense of moral duty (Gössling et al., 2020). This requires explanation, flying has a big impact on an individual's ecological footprint. Fridays for Future framed this footprint as a personal responsibility, rather than pushing the blame on the aviation industry. This focus on the individual brought forwards feelings of shame and thus, Flygskam was born (Gössling et al., 2020). Flygskam became trending on Twitter worldwide following the now well-known climate protests organized by Extinction Rebellion and Fridays for Future in which thousands of students took part and skipped classes across the world (Marquardt, 2020), in the Netherlands this phenomenon of students skipping classes was known as the klimaatstakingen (climate strikes).

At the moment, however, there is hardly any research on the effects of flight shame on an individual's flying habits, or whether or not the availability of alternatives has an influence on perceived feelings of flight shame, especially not in a country like the Netherlands.

Therefore this research's main question is:

To what extent do Dutch people feel ashamed of flying and how do these feelings of flight shame arise and alter flying habits?

To answer this, two sub-questions are proposed:

1: Is there a relation between Dutch people's perceived knowledge of the impact flying has on the environment and feelings of flight shame perceived by respondents and what are the reasons for this?

2: Did Dutch people that experienced flight shame change their flying habits as a result? And in what way / why not?

1.2 Societal and Academic Relevance

The topic of flight shame is socially very relevant, as well as very topical for today's situation. Dutch people have less trust in the national government and more than half of Dutch people (62%) think that the Netherlands will fail to significantly reduce its emissions to abide by the Paris agreements (Willis, 2021). Some researchers even go as far as to say that a new type of global traveller has been born as a result of the current situation with the climate: the environmental traveller (Papa, 2020).

To further underline the importance of this research, it was recently found that COVID-19 has influenced the environmental moral obligation of travellers as well as their environmental responsibility (O'Connor and Assaker, 2021). Meaning that feelings of flight shame could have become stronger after the COVID-19 pandemic.

Since flight shame is a relatively new topic of debate in the academic field, research on the topic is very limited. The bigger research papers covering flight shame, written by Gössling et al. and Doran et al. focus on Norway, Sweden, and Germany. Therefore doing research on the Netherlands and its population fills a gap in the existing knowledge and this makes it highly academically relevant. As mentioned previously, flight shame originates from feelings of moral duty and personal responsibility. As already researched in 1999, feelings of responsibility, especially feelings of guilt are important drivers and predictors of ecological behaviour (Kaiser and Shimoda, 1999). Other personal habits that might be affected by these feelings of guilt are abstaining from eating meat or uneasiness when driving cars (Boto-García and Buccioli, 2020; Ruby, 2012).

2 Theoretical framework

2.1 Climate change and the aviation industry

Climate change is one of the most well-known, yet complex issues that humankind faces today. Global transport is one of the biggest contributors to global emissions, accounting for 26% of all global CO² emissions in 2007 (Chapman, 2007). Since 2007, global transport's share has gone down somewhat to about 24% in 2016 (Wang and Ge, 2019). It is no secret that aviation produces a lot of emissions, according to Ritchie (2020) aviation produces 2.5% of global CO² and is responsible for 1.9% of all emissions worldwide (Ritchie, 2020).

It is an established and well-known fact that aviation is bad for the environment, so is driving a car, however, aviation's emissions affect the earth and climate in a different way. According to Gössling et al. (2007), aviation is up to 5.1 times as harmful to the environment when compared to ground-based traffic's emissions. This is due to the heights at which the emissions are emitted, therefore emissions as a result of aviation, impact ozone regeneration and cloud generation (Gössling et al., 2007).

2.2 The Netherlands and climate change

The Netherlands is highly aware of climate change, more so than other countries. In the United States, for example, only half the population views climate change as a risk to themselves (Ballew et al., 2019). According to Drummond et al. (2018), public awareness and public perception of the threat of climate change are of great importance when it comes to governmental policy regarding climate change (Drummond et al., 2018). People in the Netherlands are very aware of climate change, in fact, according to the European Investment Bank (EIB), 77% of Dutch people view climate change and its effects as the greatest challenge for humanity (Willis, 2021). The EIB published these figures after conducting their 4th international Climate Survey. According to the results of the EIB's climate change survey, the vast majority of Dutch respondents (88%) are in favour of replacing short-distance flights with a fast and low-emission emitting European railroad network. Across the EU27 countries, the percentage was very comparable at 87% in favour of a high-speed railroad network. But do the Dutch experience flight shame as a result of the relatively high awareness and supposed willingness to make use of other methods of travel? In Sweden, a country that is also highly aware of climate change, and in addition the birthplace of flight shame, monthly declines in domestic aviation were actually observed (Gössling et al., 2020). This monthly decline is thought to be the result, at least partially because of flight shame, however, there is no research of this particular trend in the Netherlands.

2.3 Flight shame and the aviation industry

Flight shame was named by Gössling et al. (2020) to be the biggest threat to consumer aviation in the near future, losing popularity because of its climate intensity. In the same paper it is argued that flying has always been associated with social status (Gössling et al., 2020), however, nowadays this is changing and Gössling et al. (2020) argue that this is at least partly due to flight shame. It could be argued that the image of flying has shifted from glamorous to (in some cases) shameful. In recent years, airlines have tried to contribute a bit to sustainability by offering passengers the chance to pay extra in order to compensate for the emissions their flight will emit. At the moment it is unsure whether these compensation schemes have a significant effect on flight shame, however, in a recent study, it was found that people that experience a higher degree of flight shame were willing to pay a higher amount of compensation (Loy et al., 2021). The same study also found that the degree of willingness to make use of other transportation methods, like trains or the car, was higher in people

that experience more flight shame. This willingness to use other methods of international travel could be the result of the mobility transition.

2.4 The sustainable travel and the COVID-19 pandemic

At this time, mobility is undergoing a transition period, this transition is called the sustainable mobility transition. The sustainable mobility transition can be described as the shift from traditional means of mobility to new, more sustainable methods of transport that limit greenhouse gas (GHG) emissions (Griffiths et al., 2021). During the Covid-19 pandemic, transport saw a decline in demand and all unnecessary transport was forgone when possible (Griffiths et al., 2021). According to Griffiths et al. (2021), this provides opportunities for the transition to more sustainable means of travel. However, most of these solutions can be found in the field of personal, small-scale transport; meaning cars, whereas aviation seems to lack behind. Before the COVID-19 pandemic hit, aviation was growing and Aviation even saw development projects such as runway extensions (Becken et al., 2021; Griffiths et al., 2021). In the case of the Netherlands, a complete second airport next to Schiphol was even planned. Even before the Covid-19 pandemic hit, aviation saw some criticism because of the associated GHG emissions (Becken et al., 2021). But, the aviation industry has not forgone the sustainable mobility transition altogether. Before the COVID-19 pandemic, as well as during, a lot of research was conducted into sustainable aviation fuels (SAF). SAF can potentially be sourced from algae, as well as various species of plants and palms (Gole et al., 2021; Ranucci et al., 2018). If developed further, Gole et al. (2021) go as far as saying SAFs can reduce the ecological footprint of the aviation industry by up to 80%.

2.5 Conceptual model

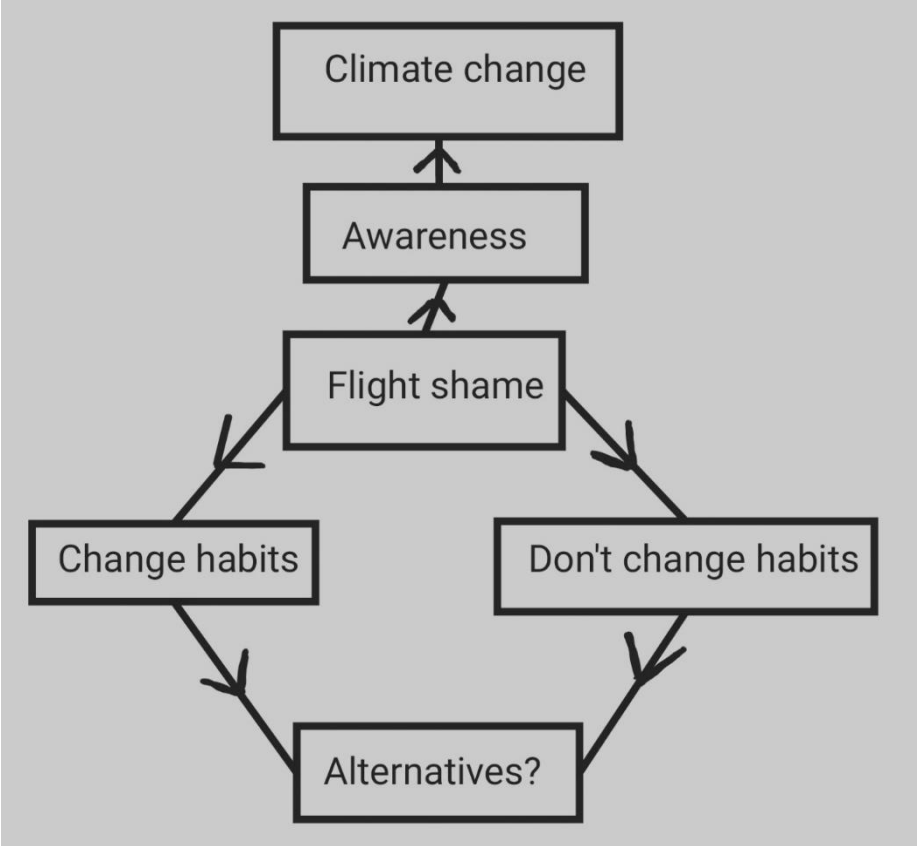


Figure 1: Conceptual model of the research

The theoretical model that accompanies this thesis can be read in a multitude of ways. Its intended use starts at “flight shame”. Flight shame can cause an individual to either change their flying habits or choose not to alter their flying habits, this choice may depend on the availability of alternatives for the individual’s journey. Following the arrow upwards will bring the reader to a box called awareness, which in turn leads to climate change. As found by Gössling et al. (2020), awareness of the effect aviation has on the climate is one of the possible reasons an individual might experience feelings of flight shame. On the other hand, when an individual overestimates the effect of flying on the environment, this individual will likely also feel more ashamed of their flight habits (Chiambaretto et al., 2021). However, this research was conducted in Germany.

2.6 Hypotheses

It is expected that the self-indicated knowledge of the effects of flying on the environment will have a positive effect on the degree to which respondents experience flight shame. In other words, feelings of flight shame in Dutch people arise because they are more aware of the effects flying has on the environment or feel more aware. Secondly, it is expected that people who experience flight shame, alter their flying habits as a result, in order to avoid air travel and therefore make more use of alternatives such as the train or long car drives.

3 Methodology

3.1 Research questions

The main research question of this thesis is:

To what extent do Dutch people feel ashamed of flying and how do these feelings of flight shame arise and alter flying habits?

To answer this question, the following sub-questions are proposed:

Is there a relation between Dutch people's perceived knowledge of the impact flying has on the environment and feelings of flight shame perceived by respondents and what are the reasons for this?

The other sub-question question will be:

Did Dutch people that experienced flight shame change their flying habits as a result? And in what way / why not?

3.2 Data collection and research design

The primary data collection for this research was done by the means of a survey, in order to reach as many respondents as possible. The survey was made with Qualtrics, with access provided by the University of Groningen. The research design can be characterized as a cross-sectional correlational research with data obtained from one survey as well as literature. The tables and charts used in this thesis are made by the researcher with the program SPSS26 (by IBM Statistics) unless stated otherwise in the figure's description.

3.2 Sampling

In order to reach as many respondents as possible, the sampling method used was convenience sampling as well as snowball sampling. Convenience sampling in this case meaning, every Dutch person willing to participate. The survey was distributed via Whatsapp amongst friends and family alongside a request to forward the survey to other people, preferably more than one; this was done in order to create a snowball effect. Furthermore, the survey was also shared on Facebook with the aforementioned request. In order to only reach Dutch respondents, the survey, as well as the accompanying messages and information were only available in Dutch.

3.3 Ethical considerations

People that took part in the survey were informed that the survey was anonymous and were assured that the data would not lead back to them in any way. This research could spark interest in the topic of flight shame and therefore people that did not experience flight shame in the past could potentially experience flight shame in the future. In order to make sure potential respondents know enough about the topic that they are going to be answering questions about, the survey will explain the most important concepts of this study before the first question. Such concepts are: Flight shame, flying habits, global warming, and climate intensity. Respondents first had to read these concepts as well as agree to measures regarding their privacy before being able to start the survey. However, introducing the respondents to some of the concepts might cause respondents to answer questions differently than they would normally, for example, act more concerned. It was important to the research that the respondents know the concepts but the questionnaire did not provide the respondents with any undertone to the concepts, neither positive nor negative, as neutral as possible. This way respondents are aware of all important concepts but they should not be influenced in any way to answer in a specific fashion.

3.4 Survey design

The survey was designed to be short, as many open-ended questions were going to be added. Shorter surveys that take little time to complete get a lot more respondents (Burchell and Marsh, 1992; Jepson et al., 2005). Burchell and Marsh (1992) state that open ended-questions do not necessarily have a negative influence on survey response, however, starting off with an open-ended question does have a negative effect. In the distributed survey the first text entry question can be found at question seven, however, the respondents did have an option for a text entry at question six.

The goal of the survey was to gather data in order to answer the research questions. Some questions are asked in specific ways in order to get specific statistically useable answers. To achieve this, some questions feature Likert scales. The results these questions yielded were treated in SPSS26 in order to determine whether or not there was a relationship between perceived feelings of flight shame and awareness of the effects flying has on the environment. The open-ended questions will be approached and treated like qualitative research data in order to answer the other two research questions.

3.5 The survey

The untranslated, distributed version of the survey can be found in Appendix 1.

Question	Way of answering
Q1: What is your gender	MC: Male, Female, Other/Prefer not to say
Q2: What is your age?	Open-ended
Q3: What is your highest completed form of education?	MC: VMBO, HAVO, VWO, MBO, HBO, WO, HBO Master, WO Master, PHD
Q4: Have you ever travelled by plane?	MC: Yes, No (if No is chosen → end of survey)
Q5: To what extent are you aware of the effects flying has on the environment? Choose the option that applies to you best.	Likert scale: 1 (I don't know), 2 (I have some idea), 3 (I know a little), 4 (I know pretty well), 5 (I am very aware)
Q6: What are the most common reasons for you to make use of airplanes?	MA: Holiday, Family/friends visit, Work-related, Other: (text entry)
Q7: Do you ever use other means of transport when travelling internationally?	MC: No, Yes: (text entry)
Q8: For what reasons do you choose alternative ways of travelling other than the airplane?	Open-ended
Q9: Flight shame is a concept used to indicate a feeling of uneasiness when an individual can experience when travelling by airplanes. Usually, these feelings occur because flying is known to be very energy-intensive. Before taking part in this questionnaire, had you ever heard of flight shame?	MC: Yes, No
Q10: Do you ever experience flight shame yourself?	Likert scale: 0 – 10 (0 = I never experience flight shame) (10 = I always experience flight shame)
Q11: Can you elaborate on your answer to the last question?	Open-ended
Q12: If you've ever experienced flight shame / experience flight shame, did you alter your flying habits as a result? If not, why not?	MC: I have changed my flying habits: (text entry), I have not changed my flying habits: (text entry), I never experience flight shame.
Q13: At the moment, do you think there are enough alternatives to aviation?	MC: Yes, No

Q14: Imagine there was an international railway system and this is comparable to the NS (Dutch Railroads), The prices would be comparable to those of airlines. In this scenario, would you make use of the trains more often for international travel?

Open-ended

Note. MC = Multiple Choice. MA = Multiple Answer.

3.6 Sample information

The survey was made with Qualtrics and was online from 30-03-22 until 02-05-22, however, the last result was collected on April 20th. The survey had a total of 158 respondents of which 144 had a 100% completion rate. Due to some missing values, most of the questions have between 120 and 135 useable responses. The survey population reached had a large age variety with the youngest respondent being fifteen years old and the oldest respondent being eighty years of age (Figure 2). The study reached more women than men (figure 3).

Overall the collected data is of a high enough quality to use for this research, however, the data is not normally distributed. Therefore, if this study was to ever be repeated, it is likely the research would benefit from a larger more representative research population or possibly make use of an existing larger dataset if this is available

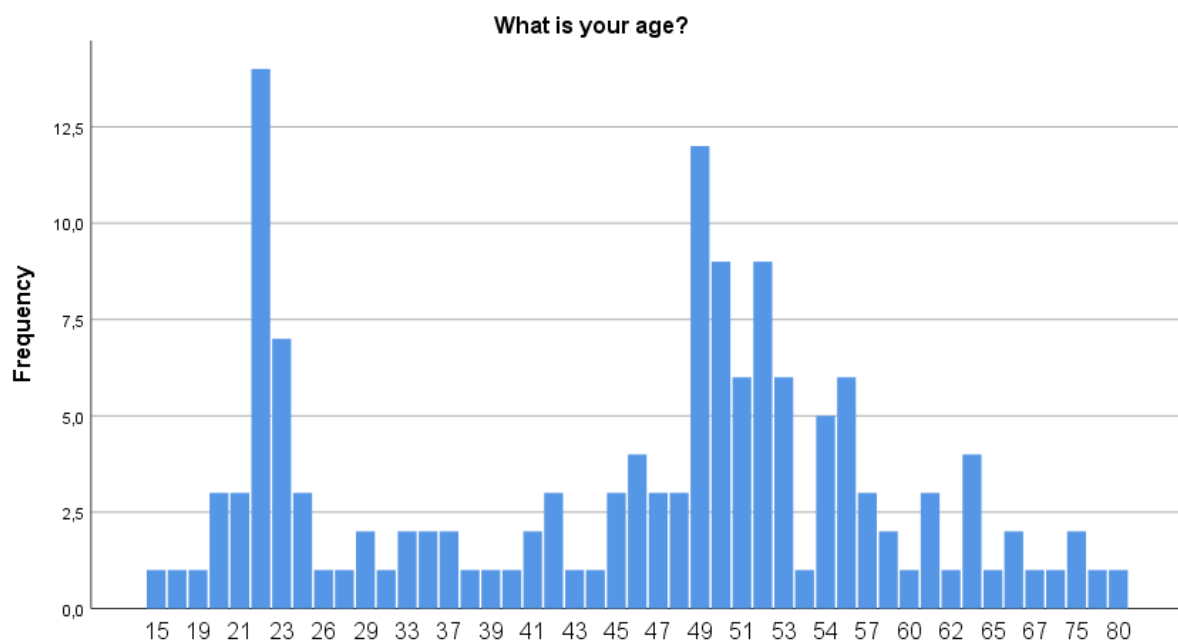


Figure 2: Age of the respondents (Frequency). (made in SPSS26 by IBM Statistics (Translated))

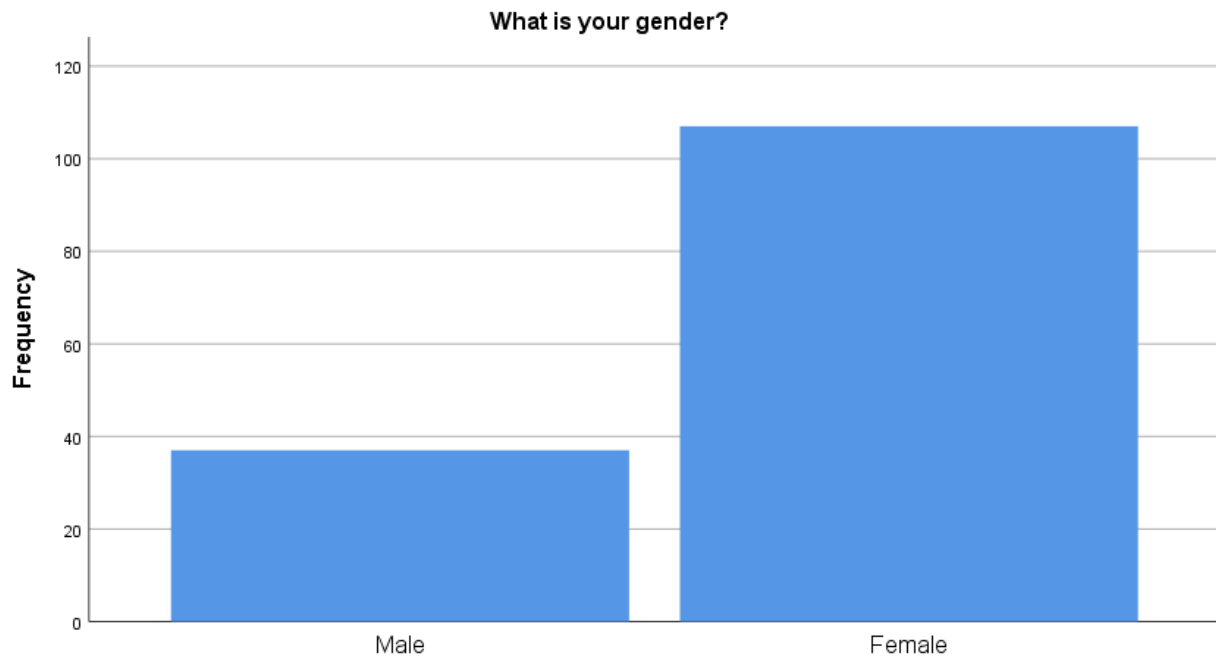


Figure 3: Gender of the respondents (Frequency). (made in SPSS26 by IBM Statistics (Translated))

3.7 Data analysis

The first sub-question used Likert scale data in order to do a simple linear regression. The two questions used to answer the question were **Q5** and **Q10**. Q5 used a five-point Likert scale and Q10 used a ten-point Likert scale. The goal was to establish whether or not there was a linear relationship between the variables and whether the feelings of flight shame could be explained by an individual's awareness of the effects of climate change. The statistics were done in SPSS26 by IBM Statistics.

As a Likert scale is an ordinal variable, the statistical test used in SPSS was linear regression. To make sure only individuals that answered both of the questions would be included in the regression, a special selection was made in SPSS by means of the NMISS function, the NMISS function was set to <1 for both Q5 and Q10 meaning that a case would not be included if a respondent failed to answer one of the two questions, this can be seen in the syntax file included in the appendix. When the correct cases were selected, the regression was done, more details can be found in the syntax file in the appendix. Another regression was also run, this regression featured in: the education level (coded into dummies for higher educated (HBO+) and lower educated (MBO-), as well as the age of the respondents. However, this regression was not used because neither of these added variables was significant and would therefore only cloud the results making it harder to interpret and understand for the reader. The other, extended, regression analysis is available and can be provided by the researcher on request.

4 Results

4.1.1 Sub-question 1: Is there a relation between Dutch people’s perceived knowledge of the impact flying has on the environment and feelings of flight shame perceived by respondents and what are the reasons for this?

To answer this question, a simple linear regression was conducted in SPSS 26 by IBM Statistics as stated in the methodology. The used variables were the survey answers to the following questions, both questions were answered by the means of a Likert scale.

Q5: *To what extent are you aware of the effects flying has on the environment?*

And **Q10:** *Do you ever experience flight shame?*

The regression was conducted in order to establish whether there was a significant linear relationship between the awareness people have of the effects flying has on the environment and the perceived feelings of flight shame. In order to determine this, **Q5** was used as the predictor (constant) for the analysis and **Q10** was chosen as the dependent variable. The results of the analysis are displayed in Tables 2 and 3, and the descriptive statistics of the regression analysis can be found in Table 1. The tables displayed underneath are translated tables, the original tables, as well as additional graphs, can be found in Appendix 4.

Descriptive Statistics

	Mean	Std. Deviation	N
Do you ever experience flight shame? – Choose the value that best applies to you	3,4831	2,91982	118
To what extent are you aware of the effects flying has on the environment?	3,8983	,83092	118

Table 1: Descriptive statistics of the regression analysis. (made in SPSS26 by IBM Statistics (Translated))

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,366 ^a	,134	,126	2,72930

a. Predictors: (Constant): To what extent are you aware of the effects flying has on the environment?

b. Dependent Variable: Do you ever experience flight shame? – Choose the value that best applies to you

Table 2: Model summary of the regression analysis. (made in SPSS26 by IBM Statistics (Translated))

Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	-1,526	1,210		-1,261	,210
	To what extent are you aware of the effects flying has on the environment?	1,285	,304	,366	4,231	,000

a. Dependent Variable: Do you ever experience flight shame? – Choose the value that best applies to you
 Table 3: Regression coefficients of the simple linear regression analysis. (made in SPSS26 by IBM Statistics (Translated))

The variable was significant ($p < 0,01$). Q5 (To what extent are you aware of the effects flying has on the environment?) was able to explain 13,4% (0,134) of the variance measured in Q10 (Do you ever experience flight shame?). This means that the test was significant and that perceived knowledge of the effects flying has on the environment (Q5) does influence perceived feelings of flight shame.

The most important result can be found in table 3, the unstandardized coefficient of the model (**B**) is 1.285. This means that for every point a respondent goes up on the Likert scale indicating their knowledge of the effects flying has on the environment, they are predicted to go up 1.285 points on the scale indicating their perceived feelings of flight shame. Or for short, according to the regression analysis, it is predicted that Dutch people who indicate to be more aware of the effects flying has on the environment, will indicate to experience more feelings of flight shame.

The findings displayed are in line with existing literature. In research done by Gössling et al. (2020) and Chiambaretto et al (2021). Both studies found that people more aware of aviation’s effects on the climate would feel more flight shame. Therefore the results found in this Dutch population are in line with Swedish and German populations.

4.1.2 What are the reasons Dutch people indicate (no) feelings of flight shame?

In order to answer this question, **Q10** of the survey had a follow-up question. **Q11**: Can you elaborate on your answer to the last question? The answers to this question differed a lot from person to person. The vast majority (>75%) that did not feel flight shame indicated that this was because they did not use the airplane often. Answers like “I barely make use of airplanes, when I do I am not ashamed of it.” return quite often.

The people that do have stronger feelings of flight shame (> 6 on the Likert scale) indicate that their experiences of flight shame only started recently and that they have become more aware of the negative effects flying has over the last years. This was expected as flight shame is a relatively young concept and has had a lot of media coverage in recent years as was mentioned earlier in this research.

A big majority of respondents mentioned the feeling of necessity. Sometimes, destinations are not reachable via alternatives. For some respondents, this was the reason they would occasionally fly

even though they experience shameful feelings from doing so. For other respondents, the necessity took the shame away, as they feel like they simply do not have a choice in these cases. This feeling of necessity was also found by Gössling et al. (2019). These feelings of necessity tend to take away the feelings of guilt people might experience as well, which as mentioned earlier, play a big role in the feelings of responsibility an individual experiences (Kaiser and Shimoda, 1999). In turn, this could lead to people feeling less flight shame as flight shame originates from feelings of personal responsibility (Gössling et al., 2020).

According to both Gössling et al (2019) and Doran et al. (2022), an important factor in the degree of flight shame has to do with the necessity of the trip taken. People tend to feel more flight shame when going on a holiday than when they are visiting friends and family, or travelling for work. However, in this research, this did not come forward and was not reported by any of the respondents.

4.2.1 Sub-question 2: Did Dutch people that experienced flight shame change their flying habits as a result? And in what way / why not?

As can be seen in figure 4, most of the respondents (44.83%) indicated not feeling flight shame, this is in line with research done by Doran et al (2022) as well as Wormbs and Söderberg (2021). However, what is interesting to note is that of the respondents that do indicate feeling flight shame, most of them did not alter their flying behaviour (34.48%) as opposed to the people who did change their flying behaviour (20,69%) which was unexpected. In order to analyse these results, respondents were given the chance to elaborate on their choice.

If you've ever experienced flight shame / experience flight shame, did you alter your flying habits as a result? If not, why not? - Selected Choice

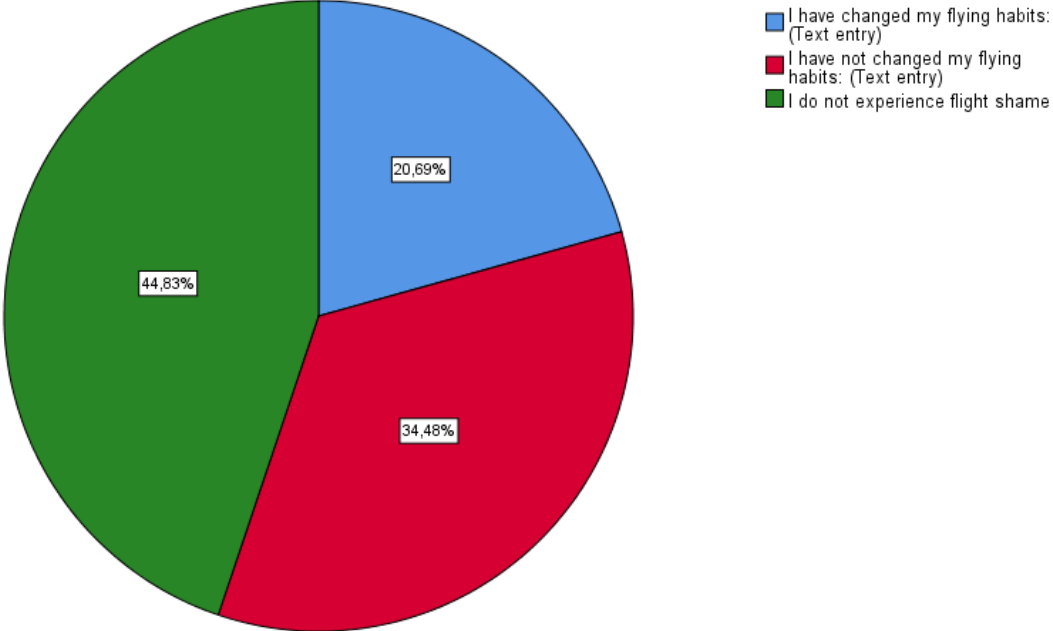


Figure 4: Pie chart of the results of question 12 (in percentages). (made in SPSS26 by IBM Statistics (Translated))

4.2.2 People that changed their flying habits

There were twenty-four text entries from respondents indicating they changed their flying habits, as most of the text entries were really short, coding the answers for analysis was deemed unnecessary by the researcher. All text entries indicated that the respondents started making less use of aviation, some respondents (N=5) indicated that they had stopped making use of the airplane entirely. One respondent even went as far as to say they felt bad taking the car to go on holiday. It is not uncommon for people to stop flying entirely as a result of flight shame. In 2019, in a large survey conducted in Sweden, 14% of people indicated that they had stopped flying entirely (Wormbs and Söderberg, 2021). Making less use of aviation when possible was in line with the expectations of the researcher.

4.2.3 People that did not change their flying habits

For this question, there were 34 text entries. This group of respondents is very interesting as these are respondents that do indicate they feel flight shame, however, they also indicate that they did not change their flying habits. Most of the respondents indicate that they are hardly making use of the airplane, to begin with and that they are therefore willing to keep making use of the airplane. When this is compared to the origins of flight shame, as mentioned in the introduction, this mindset is almost the opposite of the idea that formed into flight shame. Flight shame originated by playing into the individual's ecological footprint, even flying once per year has a large impact on the footprint. However, in a research done by Árnadóttir et al. (2021,) a similar result was found. In that research, it was even found that none of the respondents, not even the most environmentally aware people were willing to completely give up flying.

Other reasons indicated by the respondents mention the absence of good alternatives for flying. This was also asked in the survey. Respondents were asked if they thought there were enough alternatives to aviation in question 13. The results of this question can be found in figure 5 below.

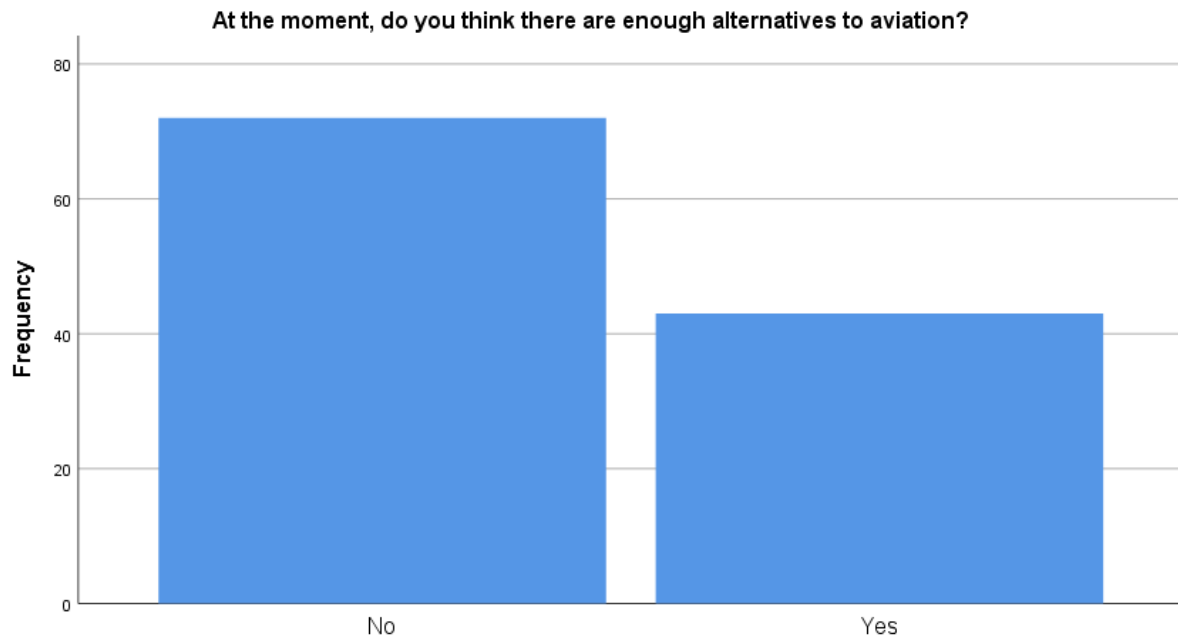


Figure 5: Frequencies for Q13: At the moment, do you think there are enough alternatives to aviation? (Made in SPSS26 by IBM Statistics (Translated))

As seen in figure 4, most of the respondents indicate that they do not think there are enough alternatives to aviation at the moment. This is in accordance with existing literature. In the previously mentioned research conducted in 2021 a comparable result was found (Árnadóttir et al., 2021). The last question of the survey was: *Imagine there was an international railway system and this is comparable to the NS (Dutch Railroads), The prices would be comparable to those of airlines. In this scenario, would you make use of the trains more often for international travel?*

This question was open-ended and received 135 text entries. Of these entries 99 indicated they would definitely make use of this hypothetical train network, 21 indicated they would not, and 16 respondents answered they were not sure. Almost all of the respondents that indicated not to make use of the hypothetical train network said this had to do with travel time. They indicated that trains take a lot longer to reach a destination than an airplane would. This answer could have been influenced by the comparison to the NS (Dutch Railways) in the question rather than mentioning high-speed connections.

An answer that was seen multiple times by people that indicated that they would make use of the hypothetical train network was that they would love to see more of the journey and the landscapes they would travel through. Another thing that was mentioned often was that people would definitely start using the train network for shorter, European travel, this is in line with the research by Willis (2019) as these findings indicated that 88% of Dutch people were in favour of implementing a high-speed European train network in order to be less dependent on aviation.

5 Conclusion

5.1 Answering the research question

This research aimed to answer the following question: ***To what extent do Dutch people feel ashamed of flying and how do these feelings of flight shame arise and alter flying habits?*** Based on a quantitative analysis of the results of the distributed survey, it can be said that Dutch people do experience feelings of flight shame, especially people who feel more aware of the effects flying has on the environment. Therefore, according to the regression analysis done in this research, it is likely that feelings of flight shame arise as a result of knowledge about aviation's effects on the climate. This result was in line with the hypothesis for this part of the research, as well as existing research was done by Chiambaretto et al. (2021) and Gössling et al. (2020).

From the second part of this research, it appears that there is no concrete proof that Dutch people who experience flight shame, also alter their flying habits. The answer to this part of the research arises because the results were split. 20.69% of people that experienced flight shame indicated that they had changed their flying habits as a result whereas 34.48% of people that experienced flight shame indicated not to have changed their flying habits. This result was different from the hypothesis as it was expected that Dutch people who felt ashamed of flying would alter their flying habits in order to avoid making use of aviation. However, the result was not unexpected as most existing studies on the topic found similar results (Chiambaretto et al., 2021; Gössling et al., 2020). Only Doran et al. (2021) predicted people who felt flight shame to actively change their flying habits.

From the research, it can be concluded that Dutch people are willing to make more use of trains in the future for short-distance trips within Europe. However, at the moment, this does not seem realistic as the European train network is not fully realized and the travel times are, as of now, still very long.

5.2 Limitations and recommendations for future research

It is important to acknowledge the limitations of this research. The research is based on a limited dataset as the researcher does not have access to large relevant datasets and therefore the number of cases is quite limited. Furthermore, the data retrieved from the questionnaire is only a snapshot in time and individuals' opinions may very likely change over time. The results of this research are some of the first insights into Dutch people's views and behaviours regarding flight shame and therefore there are a lot of opportunities for future research. Respondents in this research often mentioned they never felt ashamed of flying until recently. Therefore future research could aim at looking at Dutch people's flying habits over time as it would be very interesting to do a deeper, more extended research into the views of Dutch people, regarding flight shame. Did people ever think about the negative impacts of flying? When did they start to think about it and what does the future hold? Whereas this research was a quantitative approach, future research could benefit from a mixed-methods approach or even a qualitative approach in order to go deeper into individuals' reasoning for feeling or not feeling flight shame as well as their flying habits.

5.3 Reflection

As the researcher, I would consider the research quite successful. I am overall happy with the dataset received from the survey and the results that were reached after analysis. I am especially happy with the snowball effect created by the people who filled in my survey as I would never have been able to reach so many respondents on my own. I am also very pleased with my two supervisors as they were incredibly helpful and fast with responding throughout the entirety of the project. I probably had the most trouble with coming up with a research subject for my thesis in our group and the exercises provided by them really helped me circle in on what I found interesting and this made it so that I

even quite enjoyed doing the research. On a critical note to myself, I should have read more literature before designing my questionnaire, as during the research I felt like I missed some opportunities in that regard and I could have asked more specific questions. If I had done this, it would have been easier to compare some of my results to existing literature.

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7 Appendixes

1: The survey as it was distributed

Question	Way of answering
<p>Welkom bij deze vragenlijst over vliegschaamte. Vliegschaamte is een begrip dat wordt gebruikt om een gevoel van schaamte en ongemakkelijkheid aan te duiden wanneer een individu gebruik maakt van het vliegtuig, meestal ontstaat dit omdat vliegen erg energie-intens is en slecht is voor het milieu. Voor mijn onderzoek richt ik mij op vliegschaamte en eventuele veranderingen in de vlieggewoonten van Nederlanders. Deelname aan deze vragenlijst is anoniem en u hoeft uw naam dan ook nergens in te vullen. De gegevens die u invult tijdens deze vragenlijst zullen niet gedeeld worden met derden en worden alleen gebruikt door de onderzoeker. Tot slot wil ik u bij deze heel erg bedanken voor het invullen van de vragenlijst en hoop ik dat u de vragenlijst met zoveel mogelijk mensen wil delen.</p>	<p>One option: ik ga akkoord</p>
<p>Q1: Wat is uw geslacht?</p>	<p>MC: Man, Vrouw, Anders/zeg ik liever niet</p>
<p>Q2: Wat is uw leeftijd?</p>	<p>Open ended</p>
<p>Q3: Wat is uw hoogst afgeronde opleiding?</p>	<p>MC: VMBO, HAVO, VWO, MBO, HBO, WO, HBO Master, WO Master, PHD</p>
<p>Q4: Heeft u ooit gebruik gemaakt van het vliegtuig als vervoermiddel?</p>	<p>MC: Ja, Nee (if Nee is chosen → end of survey)</p>
<p>Q5: In hoeverre bent u zich bewust van de gevolgen van vliegen op het milieu?</p>	<p>Likert scale: 1 (Weet ik niet), 2 (Ik heb een idee), 3 (Ik ben me er een beetje van bewust), 4 (Ik heb een goed idee), 5 (Ik ben me zeer bewust)</p>
<p>Q6: Wat zijn de meest voorkomende redenen voor uw gebruik van het vliegtuig? U kunt meerdere opties kiezen.</p>	<p>MA: Vakantie, Familie/vrienden bezoek, Werk gerelateerd, Anders: (text entry)</p>
<p>Q7: Maakt u ooit gebruik van andere vervoersmiddelen voor internationale reizen?</p>	<p>MC: Nee, Ja: (text entry)</p>
<p>Q8: Wat zijn voor u de redenen dat u kiest voor alternatieve vervoersmiddelen dan het vliegtuig?</p>	<p>Open ended</p>
<p>Q9: Vliegschaamte is een begrip dat wordt gebruikt om een gevoel van schaamte en ongemakkelijkheid aan te duiden wanneer een individu gebruik maakt van het vliegtuig, meestal ontstaat dit omdat vliegen erg energie-intens is en slecht is voor het milieu. Was u voordat u aan deze vragenlijst begon al bekend met het begrip vliegschaamte?</p>	<p>MC: Ja, Nee</p>
<p>Q10: Heeft u zelf weleens last van vliegschaamte?</p>	<p>Likert scale: 0 – 10 (0 = Ik heb nooit last van vliegschaamte) (10 = Ik heb altijd last van vliegschaamte)</p>

Q11: Kunt u uw antwoord op de vorige vraag toelichten?	Open ended
Q12: Indien u ooit last heeft gehad / last heeft van vliedschaamte, heeft u uw vlieggewoonten toen aangepast? Zo niet, waarom niet?	MC: Ik heb mijn vlieggewoonten aangepast: (text entry), Ik heb mijn vlieggewoonten niet aangepast: (text entry), Ik heb geen last van vliedschaamte.
Q13: Op dit moment, denkt u dat er genoeg alternatieven zijn voor het vliegtuig?	MC: Ja, Nee
Q14: Stel dat er een internationaal spoornetwerk was en dat dit vergelijkbaar was met bijvoorbeeld de NS, de prijs zou vergelijkbaar zijn met het vliegtuig. Zou u in dat scenario vaker een internationale reis maken met de trein, en waarom wel/niet?	Open ended

2: The syntax for the selection of the correct cases for the regression analysis

USE ALL.

COMPUTE filter_\$=(NMISS(Q5_1,Q10_1) < 1).

VARIABLE LABELS filter_\$ 'NMISS(Q5_1,Q10_1) < 1 (FILTER)'.
 VALUE LABELS filter_\$ 0 'Not Selected' 1 'Selected'.

FORMATS filter_\$ (f1.0).

FILTER BY filter_\$.

EXECUTE.

3: The syntax for the simple linear regression analysis

REGRESSION

/DESCRIPTIVES MEAN STDDEV CORR SIG N

/MISSING PAIRWISE

/STATISTICS COEFF OUTS R ANOVA

/CRITERIA=PIN(.05) POUT(.10)

/NOORIGIN

/DEPENDENT Q10_1

/METHOD=ENTER Q5_1

/SCATTERPLOT=(*ZRESID ,*ZPRED)

/RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID).

4: The results of the simple linear regression analysis

Regression

		Notes
Output Created		19-MAY-2022 11:03:43
Comments		
Input	Data	C:\Users\gijst\Desktop\thesis dataset.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	167
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Q10_1 /METHOD=ENTER Q5_1 /SCATTERPLOT=(*ZRESID ,*ZPRED) /RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID).
Resources	Processor Time	00:00:03,72
	Elapsed Time	00:00:01,75
	Memory Required	173488 bytes
	Additional Memory Required for Residual Plots	680 bytes

[DataSet1] C:\Users\gijst\Desktop\thesis dataset.sav

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	In hoeverre bent u zich bewust van de gevolgen van vliegen op het milieu? - Kies de optie die het beste bij u past ^b	.	Enter

- a. Dependent Variable: Heeft u zelf weleens last van vliegschaamte? - Kies de optie die het beste bij u past
- b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,366 ^a	,134	,126	2,72930

- a. Predictors: (Constant), In hoeverre bent u zich bewust van de gevolgen van vliegen op het milieu? - Kies de optie die het beste bij u past
- b. Dependent Variable: Heeft u zelf weleens last van vliegschaamte? - Kies de optie die het beste bij u past

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	133,372	1	133,372	17,904	,000 ^b
	Residual	864,094	116	7,449		
	Total	997,466	117			

- a. Dependent Variable: Heeft u zelf weleens last van vliegschaamte? - Kies de optie die het beste bij u past
- b. Predictors: (Constant), In hoeverre bent u zich bewust van de gevolgen van vliegen op het milieu? - Kies de optie die het beste bij u past

Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients		
				Beta		
1	(Constant)	-1,526	1,210		-1,261	,210
	In hoeverre bent u zich bewust van de gevolgen van vliegen op het milieu? - Kies de optie die het beste bij u past	1,285	,304	,366	4,231	,000

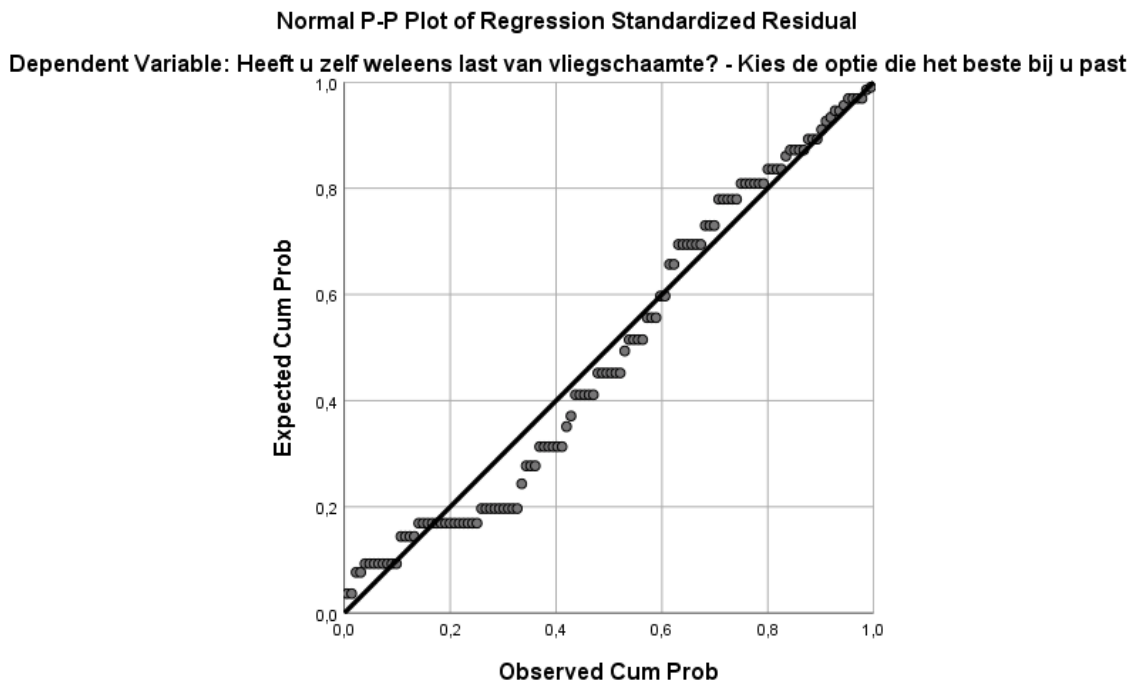
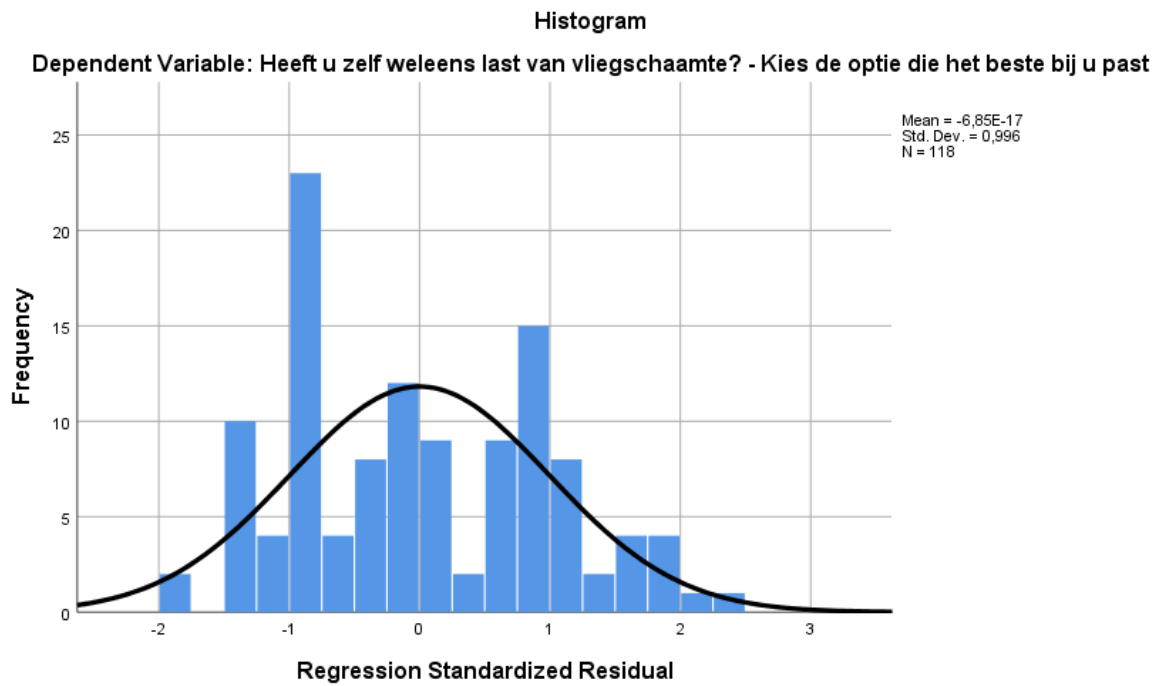
a. Dependent Variable: Heeft u zelf weleens last van vliegschaamte? - Kies de optie die het beste bij u past

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1,0439	4,8987	3,4831	1,06768	118
Residual	-4,89866	6,38628	,00000	2,71761	118
Std. Predicted Value	-2,285	1,326	,000	1,000	118
Std. Residual	-1,795	2,340	,000	,996	118

a. Dependent Variable: Heeft u zelf weleens last van vliegschaamte? - Kies de optie die het beste bij u past

Charts



Scatterplot

Dependent Variable: Heeft u zelf weleens last van vliegschaamte? - Kies de optie die het beste bij u past

