MARIA WOLRATH SÖDERBERG
AND NINA WORMBS

Grounded
Beyond flygskam

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Nina Wormbs is professor in History of technology at KTH Royal Institute of Technology, Stockholm. She has published on media history and information society and more recently on climate change in the Arctic. In particular she has focused on changing sea ice, and ways to know and communicate the decline. She has had several commissions of trust with the government and takes active part in the public debate around climate change through talks and articles in the press.

About ELF

The European Liberal Forum (ELF) is the foundation of the European Liberal Democrats, the ALDE Party. A core aspect of our work consists in issuing publications on Liberalism and European public policy issues. We also provide a space for the discussion of European politics, and offer training for liberalminded citizens. Our aim is to promote active citizenship in all of this. Our foundation is made up of a number of European think tanks, political foundations and institutes. We work throughout Europe as well as in the EU Neighborhood countries. The youth-ful and dynamic nature of ELF allows us to be at the forefront in promoting active citizenship, getting the citizen involved with European issues and building an open, Liberal Europe.

About Fores

Fores – Forum for reforms, entrepreneurship and sustainability – is a green and liberal think tank. We are a non-profit foundation that wants to renew the debate in Sweden with a belief in entrepreneurship and creating opportunities for people to shape their own lives. Market-based solutions to climate change and other environmental challenges, the long-term benefits of migration and a welcoming society, the gains of increased levels of entrepreneurship, the need for a modernization of the welfare sector and the chal- lenges of the rapidly changing digital society – these are some of the issues we focus on. We act as a link between curious citizens, opinion makers, entrepre- neurs, policymakers and researchers.

Foreword

Flygskam. This Swedish word translates as "flight shame" and has spread across the world. The term refers to feeling guilt over the environmental effects of flying and is symbolic to a movement in which an increasing amount of Swedes are choosing not to fly. However, it is not just Swedes who feel guilty about their carbon footprints: the Finnish have invented *lentohapea*, the Dutch say *vliegschaamte,* and the Germans use *flugscham*.

The contribution to European carbon emissions from air travel is growing, and has become an increasingly important climate issue. Emissions per passenger have dropped in the past decade due to more fuel-efficient aircraft, but global international aviation emissions are projected to be around 70 per cent higher in 2020 than in 2005.[1] Estimates show that emissions from global flying can be as high as 22 per cent of total emissions in 2050 if the sector fails to reverse the trend.[2] This stands in conflict with the Paris Agreement and its goal of ensuring global warming is kept well below 2 degrees Celsius. In fact, the total per capita emissions needed to achieve the targets set in the Paris Agreement, which according to the 2018 IPCC-report, is less than 3-4 tonnes by 2030 and 1 tonne 2050.[3] As a Brussels–Stockholm return flight emits 0.42 tonnes and a Brussels to New York return journey emits 1.9 tonnes,[4] flights are clearly a large part of an individual's emissions.

Yet, a reduction in flying is a challenge to the liberal idea of free movement.

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1 European Commission 2016.
2 Cames et al. 2015.
3 Masson-Delmotte et al. 2018.
4 As calculated by https://travelandclimate.org/

A high degree of mobility has long been important to the European idea and is a vital part of the integration of the union. However, if this mobility creates climate change and affects future generations, it can also be said to infringe on the freedom of others.

Although this case study focuses on Sweden, and a self-selected group among Swedes, it will still be of interest to a wider European audience since the word and phenomenom flygskam has spread to other countries.

Flying, therefore, presents a true political dilemma. With this report we hope to move beyond the simple dichotomy for and against flying and instead focus on what we can deduce in terms of policy implications from those who voluntarily choose to stop flying because of climate change.

Mette Kahlin Mcveigh, Fores think tank

Executive summary

This report details the conclusions from a survey conducted in Sweden in summer 2019 by Maria Wolrath Söderberg (Södertörn University) and Nina Wormbs (KTH Royal Institute of Technology). It is a qualitative study of a particular group of self-selected people, and thus not statistically significant of the Swedish population. The survey targeted those who had stopped or drastically reduced flying because of climate change and asked them to describe their reasoning.

In all, 673 full responses were analysed looking for recurring arguments and thought structures. These responses were grouped into four themes:

- knowledge and experience;
- the moral;
- the social; and
- alternatives.

Flight shame was hardly mentioned by the respondents. The most commonly mentioned reason to change behaviour was knowledge and insight. This insight occurs not just with the accumulation of knowledge, but in connection to a realisation of the problem's urgency. This realisation can in turn come from personal experience of climate change and is often related to strong feelings and fear.

Respondents also stressed the importance of conscience and their ambition to be consistent. They want to do the "right thing" because they regard the climate crisis to be a moral issue and a matter of justice. This idea of justice is not only in relation to others, but also to future generations: "Why should my pleas-

ures contribute to ruining somebody else's future?"

The public discussion on climate change and flying clearly affects this group, whose social context is an important factor in their decision to stop or reduce their flying. They are inspired by others who have demonstrated knowledge, set an example or led the way. In many ways children are their beacons, but also their future judges. Support from family and friends is vital to any successful new practices.

Alternatives to flying, like taking the train, are also a way to change behaviour and can furthermore sustain a decision alongside other positive values. Other modes of travel or even abstaining from travelling altogether, are found to be increasingly valuable and desirable.

A wicked problem

Flying is a wicked problem beset by conflicting goals and clashing objectives.[5] Flying has long epitomised progress and embodied mobility. It has been regarded as central to the infrastructure of globalisation, exchange, trade and transport. It has made mass tourism possible and is tightly connected to positively charged ideas of exploration, communication, development and learning. It is a vehicle of freedom.

At the same time, concerns about its climate impact are growing. Compared to most other ways of travelling, flying emits considerably more greenhouse gases. Research also shows the effects to be bigger than previously known, and that emissions linger longer in the atmosphere. Moreover, air traffic is increasing rapidly and is projected to grow even further over the coming decades. This trend is contrary to global goals and the Paris Agreement aimed at keeping global temperature increases between 1.5 and 2°C, since there are presently no sustainable alternatives to fossil fuels for the distances typically covered by air travel.

Compared to many other areas, where efforts are made to limit emissions and transit to a more sustainable system, flying stands out for two main reasons: the first is that flying is unevenly distributed – only about 3 per cent of the global population fly each year;[6] the other is that reducing flying has a huge effect on individual carbon footprints. According to the Swedish Environmental Protec-

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5 The term was coined by Rittel and Webber 1973. It designates complex, indefinable, variable, value laden problems entailing competing perspectives, and where all decisions come with unwelcome side effects. One of those who discuss climate change as a wicked problem is Hulme 2009.

6 Peeters, Gössling, and Becken 2007. New research on these figures is ongoing.

tion Agency, the average Swede has a footprint of ca 10 tonnes of CO_2 per year, of which ca 2 tonnes are directly linked to transport emissions and ca 2 tonnes in food emissions. A return flight between Stockholm and New York emits ca 2 tonnes.[7]

Now, however, we see a growing movement for staying on the ground. In Sweden it is particularly strong – we have exported the term *flygskam*. For the first time flying in Sweden is decreasing. What is happening?

In this report we meet some of those who have stopped flying and learn how they have handled the goal conflicts involved in their decision. Do they have particularly easy circumstances, or are they "ordinary" people, finding this change rather difficult? What were the decisive circumstances? Did they need and did they receive support? How did their behavioural change interplay with the debate and conditions at a system level? What have the consequences been?

We hope that this report will shed light on an important and difficult issue and stimulate discussion on climate communication and policy work.

Maria Wolrath Söderberg and *Nina Wormbs*

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7 For more specific comparisons of climate footprint from different activities see Wynes and Nicholas 2017.

Why all this interest in flying in Sweden?

The climate issue is high on the agenda. Knowledge regarding the seriousness of climate change is increasing and new reports are published regularly. But, despite increased awareness and good intentions, we emit more than ever.

There is a gap between our knowledge and intention, on the one hand, and our action, on the other. This is true both on a societal level (we have known about climate change and its causes and consequences for decades) and, for most, on an individual level. Examples abound of climate-engaged people who eat beef, drive SUVs to work, buy more clothes than they need and a new smartphone every other year and take far-flung vacations – thus enjoying lifestyles that result in emissions far beyond the global average. We have been asking ourselves why.

Our wider research deals with the gap between knowledge/intention and action. We take an interest in why it is so hard to change despite ambitions and goals founded in a strong understanding of the facts. Our example is the Swedish case, which we argue is of general interest. In Sweden, the knowledge level is high – and so is engagement. Sweden has a high profile in climate change issues and good prospects of transitioning to a sustainable society. Still, we too are too slow; if we are going to achieve the goals of the Paris Agreement, many things must change.[8]

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8 Bonde et al. 2019.

Over the past few years, change has, however, arrived in new and unexpected forms and places. More people have become vegetarians, sales of dairy alternatives have increased, community sharing has received greater attention and solar panels are becoming a status symbol.

At the beginning of 2018, three well-known journalists and public intellectuals wrote apologetic pieces in the daily press, revealing their self-delusion when it came to flying.[9] They had realised the proportions of their impact and could no longer sustain the self-deceit. Even earlier, public figures stated openly that they had stopped flying: most notably the opera singer Malena Ernman, mother of climate activist Greta Thunberg, who decided in March 2016 that she would no longer fly.[10]

However, the articles triggered a long and extensive public debate on the issue well into 2019. The negatively charged term *flygskam* ("flight shame"), which first appeared in 2017,[11] came into usage to capture the idea that you might feel shame for travelling by plane. A response to this was the word *smygflyga* ("fly on the sly"), which conveyed the idea that people might fly secretly, in the hope that no one would notice.

Discussions took place in newspapers, on the radio, on television and social media. Climate groups addressing flying proliferated, while older ones attracted new members. One example is the Facebook group We Stay on the Ground. Lead by Maja Rosén, the group launched a campaign – Flight Free 2019 – in which, you promised not to fly for the entire year 2019, if another 99,999 people would make the same pledge, amounting to 100,000 abstentions. This initiative made a compelling contribution to the ongoing discussion about how individuals can make a difference by organising themselves into collectives using digital media.

At the same time, important and tangible changes in the natural system also drew attention to the issue of climate change. The summer of 2018 was record-breaking in Sweden: in some places, temperatures ran to the highest on record.[12] Forest fires plagued large areas and ground-water levels sank even further in many parts of the country. It is safe to say climate change became real

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9 Liljestrand 2018; Hadley Kamptz 2018; Mosskin 2018.
10 Ernman and Thunberg. 2018.
11 Svensson 2018.
12 According to Swedish Meteorological and Hydrological Institute. SMHI 2018.

for many Swedes, who felt it through heat, smoke and drying wells. The general understanding was that the extreme weather was connected to climate change, and was not just indicative of normal variation.

That autumn, 15-year-old Greta Thunberg started her climate strike outside the Swedish parliament. Under the hashtag #FridaysForFuture, the ensuing social movement engaged young people globally, entered the offices of international cooperation in Davos, Brussels and New York, and put the spotlight on intergenerational justice. And in 2019 Swedes flew less.[13]

We are interested in those who have stopped flying, even if they are a small group. In an anonymous survey, we asked people who have stopped or drastically cut back on their private flying because of climate change, how they reasoned. Here, we will share insights into what might characterise such an individual process of change, and analyse its relation to general climate change mitigation and behavioural change both on an individual and collective level.

By way of background, this study originated from a larger research project where we investigate why people fail to live in accordance with their knowledge about the climate crisis.[14] There is plentiful research on the gap between knowledge and behaviour in connection to climate issues when it comes to climate scepticism. However, in Sweden climate sceptics are few, only about 2 per cent.[15] Most Swedes have good knowledge about climate change and a vast majority have positive attitudes to climate mitigation efforts and transitioning towards sustainable lifestyles.[16] Still Sweden has relatively high emissions, and they are not decreasing. In our larger study, flying was the most common situation where people recognized this gap in their own behaviour. It was a situation when they often acted against their better knowledge and thus had to justify their own behaviour to be able to live in harmony.[17] These findings coincided with the growing debate and the "stay-on-the-ground" movement. We wanted to study those who had actually changed their behaviour and stopped flying because of climate change and analyse their reasons for doing so.

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13 Swedavia 2019.
14 The project is financed by a Swedish foundation for humanities and social sciences, *Riksbankens Jubileumsfond*
15 Novus 2019.
16 Carlsson, Hammarberg, and Hultin 2015.
17 Forthcoming.

Flying is an important topic of study for many reasons. Public debate in Sweden shows that it can harbour a large number of ideas, views and arguments about mobility and transport, and demonstrates that this technology is connected to issues of lifestyle, cultural capital, belonging, consumption, tourism, freedom and even progress. This debate has brought out discussions on, for example, technological change, regulation and taxation, individual vs collective action and justice and fairness. A debate like this is an opportunity to renegotiate practices – in this case flying in general and long-distance private flying in particular. We will return to these new framings of flying in this report, as they are part of people's thought structures.

There are several reasons flying has become so prominent in the discussion on transitional change in Sweden. No doubt, one is that long-distance private flying is not a necessity for most people. Thus, people can give it up and to a large degree continue their lives as before. It is an example of "low-hanging fruit".

Another reason is that this fruit is in fact *a huge fruit*. The size of the carbon footprint made by flying makes it particularly suitable if you want to reduce your personal emissions quickly. As explored in appendix A, a return flight to Thailand – a vacation destination increasingly popular with middle class Swedes – is equivalent to about 2.8 tonnes of CO_2. This can be compared to the total greenhouse gas budget per capita required to achieve the goals set out in the Paris Agreement. According to the IPCC report, emissions must not exceed 3-4 tonnes per capita in 2030 and 1 tonne in 2050.[18]

It also turns out that this huge low-hanging fruit is *a fruit of knowledge*. Even though there are some complicating facts about flying (specifically regarding its effect on the atmosphere), in general the emissions are rather straightforward and transparent. Compared to calculating the carbon footprint of food, which involves the weighing of factors like where food is produced, ecological conditions, water demand and biodiversity, assessing the impact of a flight to Mallorca is easy. Furthermore, the statistics of flying are also relatively transparent.

The number of people flying has grown enormously in the last decades, and it is projected to increase to extreme levels, while being unevenly distributed

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18 Masson-Delmotte et al. 2018.

within and between nations. Together, these facts are of importance to many when they decide to decrease or stop flying.

In the following pages we will share the results from our survey. Along the way we will relate our results to research in several disciplines on why change is so slow and what to do about it. Finally, we will reflect on the challenges and possibilities of European policy in relation to flying. We provide some data on flying in general and in Sweden in particular in appendix A and describe the methodology of the survey and the limits of our approach in appendix B.

'I have quit flying'

What makes people change? This is a key question in many disciplines, from ancient philosophy to more recent psychology and behavioural science and neuroscience. Our contribution is to analyse how people argue when they are able to write down their reasons for changing.

We sent out an anonymous survey to climate-engaged groups on social media such as Facebook and Twitter specifically addressing people who had stopped or drastically reduced their flying. We asked them to tell us why they had changed their behaviour, first by clicking one or more pre-selected reasons and second in their own words. Moreover, we asked what had stopped them before, and how they had overcome that hindrance. We very quickly received over 900 responses, which were reduced to 875 after weeding out those that were incomplete. These respondents answered what made them quit by choosing between a set of pre-selected questions. Most of our conclusions, however, build upon the 673 responses detailing the process in their own words.

We analysed the stories that people gave us using a methodology which is both phenomenographic and topical.[19] Phenomenography is an interpretive methodology useful when you want to capture the experience of a particular group and how that experience is expressed linguistically. We made a structured search for recurring arguments that were invoked to justify something (*topoi*). These arguments or thought structures span a range of possible perspectives on the issue.

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19 Marton and Booth 2000; Wolrath Söderberg 2019; Wolrath Söderberg 2017; Wolrath Söderberg 2012.

This method does not give *all* reasons for quitting or reducing flying; we have most likely only found reasons relating to climate change, which is also what we were looking for. We have a particular interest in people who have an interest in living a sustainable life. Thus, our survey does not say anything about what is representative of Sweden's population. It is a qualitative survey of a self-selected group that have stopped or drastically reduced flying, for climate-change reasons. However, we gain an insight into some of the most common ways of thinking for those who have actually bridged their own gap between knowledge and behaviour. We believe that this knowledge is potentially fruitful for understanding what can cause people to voluntarily change their behaviour because of climate change. For a more complete discussion of the survey and methodology, see Appendix B.

What is striking is that people in our study very often declare several reasons for changing. It is rare that only one reason or argument is brought forward even though there might have been one particular thing that caused immediate change. This is interesting from a communication and policy perspective as it means – unsurprisingly – that people have multiple motives which can be addressed separately or together. The practical consequence of this still needs to be established in relation to the specific aims of behavioural change.

Knowledge and experience

When asked to choose between a selection of reasons for stopping, more than four out of five claimed that increased knowledge about the impact of flying on climate change made them stop. Among those who detailed the process towards a decision, more than half choose to talk about knowledge. This means that in this group, the knowledge–action gap has been bridged. However, it seems that a particular kind of rather complex knowledge has been essential and accumulated over time:

*Knowledge and more knowledge, and more perspectives and the same infor-
mation presented in new ways or by new partners is the way to approach
genuine conviction.*

*I have had the knowledge, but just on the outside. When I internalised it and
it became part of me, there was no going back.*

'I realised how serious our climate situation really is'

Looking closer at the responses dealing with increased knowledge, we see that
most of them, in one way or another, deal with insights into the seriousness and
urgency of climate change:

We have put Earth on track towards total breakdown.

*The extent of the climate crisis is also much bigger than I had previously
believed.*

Many testify that they have started to read up, and it seems that information
gathering is motivating for these respondents. Knowledge seems to have snuck
up on them, and at a certain point, it came together: 'Suddenly the climate issue
was crystal clear,' wrote one. '[One] evening a few years ago I had an epiphany'
said another. Other respondents reported: 'my eyes opened' and 'the warm
summer of 2018 was an awakening'.

Often, this insight is connected to a specific occasion. Weather is one such
trigger, and many mention the fires in Sweden during the hot summer of 2018.
Meeting someone who has posed questions to you on your behaviour can also
be influential, as can radio programmes and media events. Eighteen people
mention the IPCC report in particular. However, it seems that when this insight
is coupled with data on the harm caused by flying, there is a change.

'Flying was my largest source of emission by far'

To many, the sheer amount of greenhouse gases caused by flying comes as a shock:

*I have been interested in the environment most of my life. When as an adult I
realised how much greenhouse gases flying emits, I did not want to fly any more.*

Apparently, it is possible to understand the seriousness of climate change for a long time without reducing flying as a consequence. Many in our study testify that the proportions themselves were influential. That emissions were harmful was already known, just not *how* harmful they were:

> *I have long believed that I am environmentally conscious, but realised during 2018 how poorly I understood the extent of the problems of pollution and global warming. When I realised the big impact of air travel in my own personal "footprint" it was first a bit sad, but also an obvious decision.*

Sometimes this understanding of proportions relates to the total harm of flying, and other times to Swedish flying in particular:

> *I had earlier excused myself with the figure from the flying industry that emissions were only 2 per cent, because that does not sound so much. But now one knows that Swedish international flying is much bigger than others.*

> *I read that emissions from Swedes flying equals that of car traffic, it made me realise how large the problem of flying is.*

More often, however, the issue of proportions relates to individual emissions. It is moreover connected to a climate test taken online or through an app. The respondents have been asked to feed figures into the test, and realised that flying was responsible for a shockingly large portion of their climate footprint:

> *I found a webpage where you could calculate CO_2 emissions from air travel, so I counted how much emissions I had caused through my air travel between 2006-2017. Have been aware of the climate issue since 2015 but flying had for some reason escaped my consciousness, but now I had concrete figures and I was shocked. So I decided to never fly again.*

> *I calculated my carbon dioxide emissions in an app online and realised that I flew for 10 tonnes a year.*

Many use terminology like "climate account" or "climate budget", based on the idea that every person has a specific allowance which you can stay within or exceed. The size of this allowance is often unarticulated. However, we can

discern an awareness of numbers related to the Paris Agreement or the IPCC report, stating that emissions must not exceed 3–4 tonnes per capita by 2030 and 1 tonne 2050. Knowledge might not be specific, but many seem aware that they have a large carbon footprint and that they need to reduce it:

> Klimatkollen [*an app for calculating CO_2-impact*] *showed that my only flight 2018 used up my "account".*

> *I realised that I do not have the right to release more greenhouse gases in the world for my own pleasure but have to save "my quota" for more important things to do.*

Terms like "account", "quota" and "debt" *are* also used, and all belong to the realm of economics and accounting. But there are also other ways of relating to proportions: an article in the Swedish daily newspaper *Dagens Nyheter* made reference to shrinking sea ice, which might have been what affected the following respondent:

> *I realised how much ice our latest air travel had melted.*

Many have also discovered how their own flying relates to other activities that affect the climate:

> *I read how much of my consumption emissions that probably come from my air travel, and heck no you can be proud of living small and eating vegetarian if you fly abroad a few times per year. I probably got my insight in relation to magnitudes of order, what is big and therefore important.*

In our ongoing research project on non-action, we have seen that different kinds of budget thinking are common among those who find reasons not to change their behaviour. It is also common to have misconceptions about actual proportions. In this study, people who have stopped flying and previously adopted some kind of budget reasoning, seem to have caught sight of some of those misunderstandings. They have realised that it is not possible to offset air travel by recycling and have realised that some of their earlier reasoning is no longer valid. The realisation is visible and painful and has forced them to change.

Comparisons with other personal sources of emissions often resulted in the revelation that flying is low-hanging fruit – a relatively easy way to drastically reduce personal emissions:

> *I realised that travelling was an area where I easily and radically could reduce my own load on the environment.*

'The forest fires gave me a taste of what a changed climate can mean'

Sweden has by and large been spared from extreme weather events easily connected to climate change. The record-breaking summer of 2018, when forest fires raged, wells dried up and temperatures failed to drop for weeks, changed that. Many describe the fires as a driver of anxiety. It all became "real" and the experience produced insights and stimulated learning:

> *The warm and dry summer of 2018 [with] forest fires and sinking levels of ground-water made me fear the consequences of future climate change.*

> *Last summer our well dried out and our family of 6 made it without running water for over 3 months. It changes the entire family's view on life and our resources. Not to fly is one of many decisions we have taken to stress the planet and climate as little as possible.*

There are also those who have experienced weather and climate change in another country, which has made a strong impression:

> *My last flight was in November 2017 to Bangladesh in connection to work. When we flew over the country, I saw the water surrounding it. All the lakes and waters and the proximity to the ocean makes Bangladesh so exposed to rising sea levels. A few weeks earlier, colleagues had been in Dhaka which was flooded, and they described how they drifted in taxis with water up to the wind shield. Their luggage was in the trunk, all soaked. I met people there who will most likely be hit by climate change, much harder than I. Yet I am the one causing these emissions. I felt there and then that I did not have any right to fly.*

'Climate angst makes it impossible to fly'

The seriousness of climate change is one of the most common reasons to stop flying in our material. The realisation is often tied to very strong emotions, like fear, angst and sorrow. These feelings are generally strong and sometimes overwhelming:

> *I read an article and saw a film about the consequences of global warming. I got terrified.*

> *I realised the seriousness of the damage from flying in earnest 2018 and it gave me climate angst and panic.*

Sorrow is also mentioned – both in relation to what has been lost already through climate change and to the sacrifices that are needed. Sometimes this process takes time:

> *The thought of never flying made me sad. But it is okay now. There are alternatives.*

> *After it had sunken in I no longer mourn the trips I cannot do, simply because now they feel unreasonable and unnecessary.*

Discussion

An old and simple idea is that knowledge leads to action. This idea informs much societal information on new research; one example is health, where citizens are informed of the merits of exercise. This has been showed to work poorly, and the idea has been termed the *information deficit model*.[20] In the area of environmental action, Kollmuss and Agyeman (among others) have showed that information does not in any simple way lead to more environmentally friendly action.[21] This is called *the knowledge–action gap*.

Moser and Dilling have argued that information could be a waste of time, as those sceptical are likely to only take in information that confirms their initial

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20 Burgess, Harrison, and Filius 1998.
21 Kollmuss and Agyeman 2002.

understanding, whereas those who already know still do not change.[22] Criticising the idea that one size fits all, they argue that communication instead needs to address misunderstandings and pay attention to the values and priorities of the audience.[23] This is also a point of departure for all rhetorical communication. Moreover, climate change has often been communicated by scientists as a scientific issue, which has clear limits. One is the difficulty of conveying emotions, as emotional language is often considered to undermine scientific messaging.[24]

Our study, however, shows that more knowledge is the most common path towards change among those who have quit flying because of climate change. Over 80 per cent say that increased knowledge was the reason they changed their minds, even when they mentioned other reasons. This is also confirmed by a recent interview study in which knowledge stood out as a primary cause of change.[25] This finding gives us insight into what might work in terms of climate communication. It is important to remember that we have looked at those who have already changed, rather than a representative sample of our society, among whom a majority have not changed. However, these answers show us the *type* of knowledge and the process towards change that is possible. They give us hints about how we can begin to understand the issue of *more knowledge*.

A central piece of knowledge that our respondents highlighted was the *proportions* between the emissions caused by flying compared with other activities. When these figures are made clear the issue appears as black and white to many. This can make action easier, since the goal conflicts embedded in much climate change action are entangled with other values and are hard to streamline, as in the case of food. In comparison, flying appears as a clear-cut case.

It is likely that when awareness on the additional impact of flying increases, the impact of this knowledge about proportions will be even stronger. This additional impact is called the non-CO_2 effect in the scientific literature, and it means that the actual impact of flying is much higher due to other pollutants, water vapour and their release at high altitude.

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22 Moser and Dilling 2007.
23 Ibid., 165.
24 Oreskes 2013.
25 Jacobsson 2018.

The scientific term does not easily convey the increased impact, however, since putting "non-" before CO_2 might lead you astray. In the Swedish public debate, this extra impact from flying has been termed the "high-altitude effect" (*höghöjdseffekten*), allowing for a discussion on complex issues in simple terms. From other areas of environmental action, we know the importance of words in conveying messages, for example when the thinning of the ozone layer was termed a "hole", action became easier.[26]

Of great importance for realising the proportions is the *concreteness* of the impact. It has been pointed out that one reason for the slow reaction to climate change is the subject's evasiveness: it is invisible, intangible and for many, appearing far away both geographically and temporally. The impact can become concrete through a comparison between flying and other things in your daily life. The figure 1 tonne of CO_2 only becomes meaningful if you can relate it to something else that you can assess. Climate calculators, which add up the impacts of your activities to show your individual carbon footprint can do this, and must be regarded a very powerful tool for raising awareness of proportions.

In combination with information about average carbon footprints – both locally and from the world's population as a whole – a self-assessment is possible. People also manage to relate their present carbon footprint to the necessary future reduction to reach the goals set out in the Paris Agreement. Some responses point to the fact that the new insight is irreversible: once you have seen the proportions you cannot un-see them.

The understanding of flying as part of your personal carbon footprint relates to an idea of an individual budget or account. This reasoning is very common among those who legitimise non-action, and is in accordance with other thinking in the climate governance area as exemplified in the Kyoto protocol, where quotas are a key component. However, this thinking is often misconceived in groups that use it to legitimise non-action. It is not uncommon to try and balance "bad" emissions (from flying) with "good" emissions (from ecological food), forgetting that they are both emissions and contribute to the footprint.[27] Recent research suggests that this is due to the importance of reciprocity of

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26 Russill 2013; Grevsmühl 2018.
27 This is prevalent in our broader study within the same research project. Forthcoming.

actions and the idea that bad deeds can be balanced by good deeds.[28] To counter misconceptions like these, information is key. Research shows that there is a lack of information addressing such issues in education and government recommendations.[29]

That a personal experience of climate change enables insight and action might be expected and is also shown by several studies.[30] However, it is still important information, as there are facets to this realisation that are less straightforward. The risk of flooding is easier to envision if you have experienced flooding, and the same applies with events such as heatwaves and storms.[31] Local risks are easier to perceive than global risks. However, media reporting has a more limited effect on people's appreciation of risk.[32]

The experience of climate change does not only affect how knowledge is received but also the overall will to act. Those who understand and appreciate something as a risk are more likely to take precautions, and repeated experience enforces that. Moreover, experience might have an overspill effect, and lead to action on other issues.[33] Thus, it is crucial that experience supports the wider narrative of climate change. Scientific support for the connection between extreme weather and climate change varies from the weakest, for tornados; stronger, for Atlantic hurricanes; and strongest, for extreme heat and extreme rainfall from hurricanes.[34]

It has been claimed that neither shame nor fear are functional in relation to climate change action. The argument is that they pacify rather than enable, and push people into feelings of impotence.[35] However, the right amount of fear can raise the urgency of the matter and make it visible. In short, fear can be motivational if action is possible.[36]

There seems to be different kinds of fear. Among the respondents, it is clear that fear and angst have contributed to action. Again, it is important to remember that we study people who have changed, and what has been decisive for

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28 Sörqvist and Langeborg 2019.
29 Wynes and Nicholas 2017.
30 Demski et al. 2017; Rudman, McLean, and Bunzl 2013.
31 Frondel, Simora, and Sommer 2017.
32 Whitmarsh 2008.
33 Demski et al. 2017.
34 Union of Concerned Scientists 2018.
35 Moser and Dilling 2007.
36 Moser and Dilling 2011.

them: fear might work differently on different groups. Research suggest that conservatives, for example, can find reporting that plays on fear to be manipulative, which does not promote action on their behalf.[37]

On the other hand, if the public shares the values of a particular instance of risk information, they are more susceptible to the message.[38] If they perceive a threat as concrete and close, the risk will be an emotional experience – often involving fear – rather than a cognitive operation. This emotion will have an impact on decision making not only in the situation at hand, but in similar situations to come.[39]

Role models are mentioned in our sample, such as Greta Thunberg, who famously told the World Economic Forum in Davos and the European Parliament: 'I want you to panic!' Some might have panicked and experienced freeze, but others apparently did not. In the case of Thunberg, it is also key to remember her combination of high and low status, and the fact that she herself is not merely informing – like the newspaper articles that are often the focus of studies. She herself is acting and setting a very real example. Fear can become motivational when it is possible to translate it into action.

> ❯ Knowledge accumulates over time and in combination with realising the urgency, action can happen. The proportions of flying are essential for those who have stopped. Having something concrete to relate to helps; often climate calculators have performed this job. To experience climate change with your senses is important for changing behaviour. Fear is an emotion that can be motivational and can lead to personal action.

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37 Ibid.
38 Kahan and Braman 2008.
39 Loewenstein et al. 2001.

A moral issue

The second most common category of reasons to stop flying in our material concerns morality. Morality is implicit in many answers that have to do with revelations about the seriousness of climate change, the detrimental nature of flight emissions and the proportions of one's personal carbon footprint, but it can also be explicit.

'Flew to Bali, had a very bad conscience'

A large part of the responses deal with conscience. This is often connected to a specific flight, or the last flight the respondent took. Some make a comparison to buying clothes you do not need, but others were more general. Often, this issue was expressed as critical self-reflection or inner conflict:

> *I also get a bad conscience when I think about all those who in the near future will be hit by the consequences of global warming if we do not succeed in reaching the climate targets.*

> *I knew it is bad for climate to fly. I have had climate angst for at least 15 years. That people around me flew gave me "exemption" from better knowledge for several years. … Then I could not go against my instincts any more.*

For many, conscience is expressed as a bad feeling, and physical parables are also used:

> *I had known for a few years that it was not good to fly and finally my stomach hurt when I did.*

> *I felt disgusted by the entire concept of flying and the unsustainable, egoistic impact it has on climate.*

Others express that the decision to stop is a positive feeling:

> *I still have a positive feeling from having made this decision.*

> *I do not refrain from flying because of flying shame, I refrain because it feels great in my body.*

To live logically, or consistently, is another way in which morals are expressed.

'For a long time, I have tried to justify my flying, but now it was not possible anymore'

We have a strong need to be consistent and coherent in our reasoning, and we want to be able to motivate or defend our actions. This is the most common type of moral reasoning in the survey:

> *Have been working with environmental issues most of my life but still tried to justify my flying, but now it was not possible anymore.*

> *What you cannot defend, you should not do, thus I stopped flying.*

Some speak of an inner discussion that needs to be consistent, and many seem to regard it as a logical conflict, speaking of it in terms of sustainability or equity. Others instead have run out of excuses:

> *It is hard to see what reasons I could have to motivate a trip by plane.*

> *The more I read, the more I realised that the lifestyle we have had my entire life is totally unsustainable.*

> *I simply could not find any more good excuses to ignore my values.*

'I want to practice what I preach'

The previous way to argue dealt with an *argumentative consistency* – that actions should be defendable and possible to motivate. A related way of reasoning builds on the need to be *consistent as individuals*, which is less of a logical approach and more a holistic view on existence. Many respondents in our survey stressed that they wanted to be able to live according to their ideals. Not to do so can be painful:

> *I realised eventually that I had to stop flying all together to stand looking myself in the eye.*

> *Want to feel that I did the right thing when I eventually understood, losing my self-respect otherwise.*

People want to avoid schisms in their identity. These schisms occur between what you are and what you say, or what you do and what you know. A common

version of this line of reasoning is to even more firmly situate the reasoning in relation to identity. Setting the stage of the argument by starting with a long-standing environmental engagement is common, which then moves to the insight that they have gradually become aware that flying is in contrast with their values:

> *I have always been environmentally active, since the anti-nuclear actions in the 1970s. I grow my food and try to live consciously.*

> *I have taken interest in the environment almost all my life. When I as an adult understood how much greenhouse gases air travel releases, I did not want to fly anymore.*

These arguments are often a dialogue between the voice of conscience and the "I". Sometimes, however, there is also an imagined or real interlocutor.

'By being an example to others, you change the norm bit by bit'

It appears as though the possibility of inspiring others is an important dimension for many:

> *I felt it was extra meaningful since I could inspire more people.*

> *Now I realised I needed to take a stand and act and be a role model.*

Some also highlight the fact that their choices have made a difference. If you want to influence others, rhetorical power depends on your credibility:

> *I also realised that my decision would echo in my close circle of friends and family. And it has.*

> *I wanted to be a role model for my context, and I don't think I can argue for behavioural change among others if I don't change myself.*

When it comes to being a role model, however, there is no audience more important than children.

'I want to be able to tell the next generation that I did all I could before it became too late'

Children are possibly our most challenging moral judges. Perhaps they will hold us accountable in the future. We want to be able to look them in the eye and stand up for our choices:

> *The climate issue is our single most important issue of survival on this Earth. I made the decision since I borrow the Earth from my children and want to be able to look my grandchildren in the eye.*

The tendency to act increases when things happen in your family. Many respond that they stopped flying when they had children, grandchildren, nieces or nephews:

> *The insanely hot summer in combination with a baby made me stop completely.*

> *Greta Thunberg and Fridays for future made me think. About the same time, I had a niece and started to feel uncertain about the future of coming generations.*

> *I feel great concern for my children and their possible children.*

> *I love to travel to Asia, but I love my children more and therefore I will stop flying until the fuel is fossil free.*

'I want to be the one to take responsibility even if "nobody else" does'

Many who have stopped flying have told us that they want to take responsibility. Some connect this to personal ethics. It is a duty or an obligation that one needs to fulfil, regardless and absolute. Yet others speak of a responsibility to future generations, and some stress that adults need to do something for children to survive. Some stress responsibility as something personal and also independent of others. Others view it as something collective, of which the individual is a part:

I have been aware of the problem for 40 years but bit by bit I realised that I need to take more personal responsibility.

These arguments of responsibility stress the importance of individual action. Some place individual action in relation to society or the system, and some believe that societal change is too slow. Some speak of doing their own "share":

I realised that politicians will not solve this, but that I myself need to do what I can to reduce my climate impact.

I realised that I myself need to change my behaviour rather than wait for political action and better products.

'I don't want to contribute to more emissions'

Another way is to talk about not contributing. You do not want to be the one adding more emissions, ruining the climate for future generations. Sometimes respondents might not have very high hopes, but they still do not want to contribute:

I was in Venice and a famous square was flooded. Two metres of water was the highest ever there and it felt dystopic. I realised that Venice will be under water in a few years and I do not want to contribute to that.

Even if I don't believe it matters on the whole (it will go down the drain anyway), I do not want to contribute to carbon dioxide emission.

'In a just quota [...] I can fit one longer flight every ten years'

This point was not articulated by many of the respondents, but it is still understood from many responses that climate impact is a matter of justice. This is also true with arguments relating to budgeting or an accounting that presuppose a sharing of emission. This is a genuinely moral question: should I have more, or should we share? Some express this directly:

The insight has come bit by bit that each CO_2 molecule brought into the atmosphere is worsening the problems and encroaches other peoples' "space", as well as life and health in for example areas in the world that are prone to flooding.

Some reason in terms of rights, and some have arrived at a more general insight regarding inequities:

> *I realised that I do not have the right to emit more greenhouse gases in the world for pleasure but have to save "my quota" to more necessary things. … It is no human right to fly, nothing we have to do.*

I travelled to Nepal in 2016. First time I was in a poor country. It was so clear to me, the abundance with which we live in Sweden, I was almost disgusted.

Discussion

Conscience and morality are the second most common factors people in our study mention. This is particularly interesting: conscience has not been a central explanation for behavioural change, which might be due to the focus on trying to explain non-action rather than action in research on climate change.[40] A starting point has been the understanding that people suffer from cognitive dissonance, the unpleasant discomfort of having contradictory thoughts, values or behaviour, since they know but do not act accordingly.[41] In this survey, however, conscience is in fact brought forward as the engine of change for many. This can be explained by our focus on people who have changed and can invoke conscience as an ally in supporting that decision.

There is a dialectic structure in the arguments, as the respondents often seem to have a conversation with themselves in which two voices take part: one more selfish, habitual or simply easy-going; and the other critical, informed and knowledgeable. "I came to the conclusion that treating myself to a vacation in the sun can never outweigh the damage that it would cause." Many also place expectations on themselves to be logical, consistent individuals whose knowledge and reason should hang together and be in harmony with their overall behaviour. The respondents also display a readiness to engage in dialogue with

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40   Influential work in this regard includes Gifford 2011; Stoknes 2015; Norgaard 2011.
41   Festinger 1957. The relationship between different values and the propensity for behavioral change has however been studied. One example in regard to travelling is Büchs 2017. In our study we assume that all our informants have more or less climate engaged attitudes, since we found them through climate engaged groups and the context of the inquiry is the movement of people having stopped flying because of climate change. Another related strand of research has focused on guilt, but found that pride has a stronger relation to behavioral change. Bissing-Olson, Fielding, and Iyer 2016.

others. Sometimes these other people or conversation partners are not so well defined; but when they are, surprisingly many are children.

Children show up in many responses and also among those dealing with conscience. They are potential future judges and those you are accountable to. Invoking children also makes the argument existential, and concerns the future of your own family and ultimately the survival of humanity. In the short term, respondents might ponder their own old age and whether their children will be there, but also what their children's lives will look like.

To stress identity and the possibility to be an example is common among our respondents. You want to act according to who you believe you are. If climate action is important to you, that also means that it is an important part of your identity and lifestyle. This can work both ways: those who regard flying as an important part of their identity have a hard time giving it up. Moreover, those who continue flying while knowing about the consequences, argue that flying is meaningful.[42]

This is interesting in relation to tourism, since there is a specific case to be made for holiday flying, as research show that people seem to apply different moral rules in regard to holidays.[43] Tourism can be considered liminal, which means that you make a distinction between being away and being at home. As being away is also strongly connected to the possibility of letting go of every-day tasks and chores, you also feel relieved of normal moral obligations,[44] and therefore act and for instance consume in a way you would not when at home.[45] Our respondents, however, either do not make the distinction between the two moralities, or they question their own earlier compartmentalisation.

Answers that focus on conscience, self-criticism and moral might assume that you regard yourself important as an individual. The experience of self-efficacy is crucial for the propensity to endure and pursue behavioural change and self-efficacy is dependent of and supported by the social environment.[46] It also seems to be contagious. This is relevant for policy, since there seems to be

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42 Büchs 2017.
43 Becken 2009.
44 Cohen, Higham, and Reis 2013.
45 Hares, Dickinson, and Wilkes 2010.
46 Bandura 1978.

mutual connections between the experience of self-efficacy and the belief in, and the tendency to support, policy changes and to contribute to social change.[47] If citizens believe they can make a difference, top-down regulation in line with a specific change of values is more likely to be effective. However, there are also those in our study who consider the moral obligation to stop but at the same time subscribe to fatalism. You can hold an apocalyptic understanding and have low hopes for humanity and still change because it is the right thing to do whether or not it helps to mitigate climate change. This is also confirmed in a study by Büchs.[48] Morality does not need hope.

Parallel to an increased interest in the social aspects of climate action, it has also been argued in the public debate and among psychologists that moralising is the wrong way to go.[49] The main reason for this seems to be the risk of resistance or passivity.[50] However, our responses suggest that a moralising public debate may be rather efficient given the sociability of humans and at least among climate engaged people. Other studies confirm this; however, it seems to depend on the framing. To stress moral ideals seems to be more powerful than to claim obligations or duties.[51] Communicating climate issues as social conventions is another way to reach out to conscience without creating opposition.[52] Calls for morality work insofar as the audience shares the moral perspectives.[53]

The conscience is indeed stressed and to many in our sample, flying is a deeply moral issue. Shame is not highlighted in the same way at all, but as we shall see, the decision to change is still a reaction to a societal conversation of sorts. But it also works the other way around – morality is a driving force behind collective action,[54] and it has the power to induce courage to take a stand or act.[55]

Justice, finally, is a deeply moral argument with far-reaching consequences. The outcome of an argument based on justice is highly dependent on what you believe you are entitled to. If you regard your own lifestyle to be your right, then

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47 Bostrom, Hayes, and Crosman 2019.
48 Büchs 2017.
49 A recent Swedish example is Ortiz 2019.
50 Zomeren 2013.
51 Does, Derks, and Ellemers 2011.
52 Täuber, van Zomeren, and Kutlaca 2015.
53 For example, one study shows that while conservatives listen to references to nature's purity, much of the sustainability debate connects to concepts such as care and harm – terms that liberals more easily relate to. By morally reframing the problem, another type of conversation can be created (Feinberg and Willer 2013.).
54 Zomeren 2013.
55 Skitka 2010.

you might also argue that you have the right to fly.[56] As we have seen in our material, many claim that flying is not a right.

Climate justice is a term that might harbour very different tensions. Justice and equity has come to the fore in the global movement of #FridaysForFuture, but it is arguably also behind protests like the yellow vests in France. Successful climate mitigation on a global level needs to grapple with justice in order to be legitimate, but at the same time must realise that not all will share the same idea of entitlement.

> ❯ People want to do the right thing. This group expressed strong moral convictions which might be connected to their ability to act. They want to be consistent and be able to answer to future generations and have therefore stopped flying.

A social issue

Shame has come to fore in the public discourse in Sweden, and also internationally. In our material, shame is only explicitly addressed by a handful of respondents. However, we can find it implicitly in some of the answers and more clearly see how the social conversations and norms spreading among peers impact the reasoning about flying and the choice to stay on the ground.

'I started to feel ashamed to fly on vacation because I knew how emissions impact climate'

Most people who bring up shame refer to personal emotion:

When Greta started her strike, I cried for several days, cheeks red, tears of shame. She was talking about me, I who have knowledge but still don't do all I can.

The heatwave 2018 scared me and made me feel ashamed for all things unnecessary that contribute to global warming.

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56 Shaw and Thomas 2006.

Shame is, however, also mentioned in a more positive way – as a capacity that makes us human.

> *My New Year resolution 2018 was to help making flying uncool. Some call it shaming and bad, but I believe it is good to be ashamed if you intentionally harm others.*

'I feel responsible both for my children and future generation, and now they are talking about flight shame at work which affects me'

At times, you just do as others do and follow what you believe to be a trend that might also be in line with your own inclination:

> *I have had the knowledge for ten years for sure, but since I am not the "activist type" it did not really stick […] until the climate debate recently hit and abstaining from flying became a "thing".*

The social context is important, and most important is the family and primarily the respondent's partner:

> *I studied global issues and discussed with my family.*

> *Also have close relatives that have made the same decision and we support each other.*

'My two best friends have led the way'

Your social context and circle of friends is also important; however, the decisive context can also be more distant:

> *I lived in a collective where the others did not fly.*

> *I was walking on the street and someone from an NGO presented me with facts about the climate impact of flying.*

Many have been influenced by groups on Facebook. Here we must remember that many of our respondents found our survey precisely through these groups, and they are thus very likely to be a part of any answer regarding impact. Still,

it is clear in the material that groups like the Climate Club or We Stay on the Ground function both as channels of information and inspiration, as well as social support in the decision-making process.

'I made a promise'

Of specific interest is the campaign *Flight Free* 2020 (previously *2019*). When you join, you promise not to fly in the coming year if a total of 100,000 promise the same. This effort forcefully dismantles the argument that individual action is useless, as it evidently organises individuals into collectives. And even though the promise is only for the next year, many report that they in fact stopped immediately, as if such an important decision could not be postponed:

> *The campaign Flight Free makes the decision long lasting as you know we can only become more and more.*

> *When it comes to stop flying, I think it was the promise that others also embarked on the train, pun intended, that made it easier to make the decision. To know that you are not alone makes all the difference in the world. The more the easier it becomes and therefore the norms we spread in society are incredibly important.*

It is notable that identification with the group is motivating and strengthening. Moreover, the promise means something – it is not just a secret new year's resolution, but an official pledge that you are expected to live up to.

'News on the climate crisis made me read up'

If shame is less visible, there are other ways in which people have been affected by the public discourse. About a quarter of the respondents claim to have been influenced by the current debate around flying. This is valid both when selecting between proposed reasons and when telling their own stories. Many mention their newsfeeds and the public discourse as a source of knowledge. Often the news increased interest and raised fear:

> *Bit by bit I became more aware of the great climate impact of flying, primarily by reading news articles about it.*

Knowledge is brought out, but the fact that the issue has been high on the agenda is also stressed. Traditional media is present as part of the general public sphere, but social media is emphasised through groups and portals and other hubs. Often an article in a newspaper can circulate in social media.

'It was when the debate took off for real and people started to take a stand that I felt it was time to make up my mind'

The most common type of answers about the importance of the debate dealt with its impact on attention and values. The debate has been influential when moving from knowledge to action, and seems to have made decisions easier:

> *It has been a process over many years. But when more people chatted about it, I decided to quit totally.*

> *It was easier to abstain when the issue ended up high on the agenda.*

The companionship or the feeling of being part of a collective or a movement also contributed to change.

> *It was both knowledge and deeper "insights" that increased bit by bit and together with role models both privately and in the media, which suddenly made it totally evident.*

> *With more and more debate it started to feel harder and not like I lived as I believed we should live.*

Some have found their way to something positive, sometimes previously known, through the public debate:

> *Earlier I would have been hit negatively and personally if I had chosen not to fly, instead I am now part of a growing movement.*

> *The debate resurrected me! This is how I thought in the 90s but lost myself.*

'I read Malena Ernman's book'

Among the media events, there are a few that stand out. The most common in our survey (carried out between May and August 2019) is the story of Malena Ernman, a famous opera singer and popular entertainer, who is also a climate activist and mother of Greta Thunberg. Ernman and her husband published a book in the summer of 2018 with consent and input from their two daughters, resulting in media coverage and high sales.[57] But before that she had also posted on social media and written op-eds in newspapers.

> *I listened to Malena Ernman's book and was hit by an enormous climate angst and decided to do what I can immediately. To stop flying was the easy thing.*

> *I read that Malena Ernman did not take on work that demanded flying. I thought that if she can, I can.*

Invoked as the second most influential media event is Al Gore's *An Inconvenient Truth* film, from 2006. Those who mentioned it also testify to a long-term engagement with climate issues, which has increased lately:

> *I realised the seriousness of the climate crisis in connection to the film* An inconvenient truth 2006. *I flew a couple of times after that, but with a bad conscience. Since 2008 I don't fly.*

Other media events mentioned are the National Geographic film *Before the Flood*, Naomi Klein's book *This Changes Everything*, David Attenborough's series on the climate and *Extinction Rebellion*'s videos. Many also mention a specific article, for example one of the three that started the discussion on flying in January 2018. Sometimes a specific image is brought forward in the responses:

> *I have gathered more and more knowledge and have not been flying for a couple of years. Then I saw a diagram showing the emissions of different types of travel. It made me transform my not-so-conscious avoiding to a fully aware and political stand against.*

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57 Ernman and Thunberg, 2018. The book sold around 50 000 copies in Swedish (personal communication between Nina Wormbs and the press, September 10th 2019). It has been translated to several languages.

> *I read the sentence "to avoid one plane trip abroad is as efficient as 20 years of recycling".*

At times, specific scientists have made an impact, like professor of environmental science and former head of Stockholm Resilience Centre Johan Rockström, whose radio programme was the most shared in a popular series aired in summer 2015.[58] Another example is Kevin Anderson, professor of energy and climate change and former guest professor in climate change leadership at Uppsala University, who has influenced people through lectures and interviews. Anderson is also famous for not flying.

Almost a third of the respondents ticked the box of role models when asked what has inspired them. The most common role model and the person mentioned most was Greta Thunberg.

'I listened to Greta. I read up. And I decided'

It seems as though Thunberg pushed people from engagement to behavioural change. Sometimes she is framed as motivational, and other times she has put attention on the issue and educated people. She is also a role model and an example:

> *Greta made me raise my ambitions, because she made me scared to death about my future. And I am grateful for that.*

> *It was a Greta Thunberg-effect, pure and simple. I had not thought so much about the pollution of airplanes before.*

> *Greta Thunberg shows in words and in action that it is necessary and possible to stay on the ground and take the train instead.*

There are other role models mentioned by name too, such as the world champion arm-wrestler Heidi Andersson and climate activist Maja Rosén, initiator of We Stay on the Ground. But the most common one is a child.

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58 According to Swedish Radio, 39,000 people shared Rockström's summer talk (a classic radio programme with great social capital). He was also chosen by listeners to speak during the winter holiday.

'My teenage daughter said no to weekend trips'

If it is not Greta Thunberg who has served as inspiration, it is likely another child, part of the respondent's family:

> *Our daughter has taken the lead. Now the entire family eat vegetarian, we drive an electric car and have stopped flying.*

> *I have a nephew who is environmentally engaged. He inspired me to start cooking vegetarian food. For some reason I became more susceptible to the arguments I already knew.*

But it can also be another close family member or a friend:

> *My husband stopped flying. Then I felt I could not be worse.*

> *A neighbour who is close to me dared to ask me in an emphatic way.*

> *A good friend criticised an already planned trip. I realised she was right. So it became my last flight.*

The inspiration is also stressed in some of the responses, and if the issue is brought up around you, that helps to strengthen it:

> *I was impressed by others who have stopped flying.*

> *Role models showed me that "you can actually do that".*

> *I started a job where this was high on the agenda and several took a stand against flying which made me think twice. Also the public debate and people close to me who were examples made it into a prioritised issue for me.*

Discussion

Individuality is often heralded today and many of our respondents talk as if they make their decisions with total autonomy. However, it is striking in our material that so many are affected by conscience at the same time as there is a large public debate and intense discussions on social media. A social dimension is clearly visible in the material: people repeatedly refer to occasions "when I

heard", "when I learned", "when I was told". These processes do not occur in a vacuum. These findings are in line with research showing that we tend to underestimate the impact of social norms and debate on our own decision making.[59]

The media discussion on climate change is important for setting the agenda. However, people generally find face-to-face communication more convincing, partly because it is more personal, enables dialogue, builds trust and can be tailored.[60] In our material we see how the respondents weave together the debate in the public sphere with personal discussions in the workplace, exchanges on social media and conversations with friends and family.

Children are also mentioned as agents of change, with their up-to-date knowledge, political non-alignment and also – paradoxically – lack of resources. They are not tied up by habits, work and social norms in the same ways as their parents. Sometimes children can influence their parents in a more powerful way than other adults. This is clear in our material and is supported in the literature. A US study showed that 10–14 year-olds who were taught about climate change at school influenced their parents, and conservative fathers were most susceptible to their teenage daughters.[61] Another study showed how Girl Scouts who were taught how to save energy had a long-term influence on the energy use of their respective families.[62] Finally, rather small children in the UK taught their parents about flooding and how to protect themselves from it.[63] However, it is important that they are not only taught about the existence of climate change but also how to mitigate it.[64]

Climate leadership is a growing field of research focusing on the importance of role models, their strategies for impact, their credibility and the resulting effects. In a British study, half of the interviewees who knew someone who had stopped flying said that they fly less because of that, and three out of four claimed to have been influenced by someone they knew.[65] One of the most important aspects of a role model is to be consistent, and to embody their ideals.

59 Nolan et al. 2008.
60 Moser and Dilling 2007.
61 Lawson et al. 2019.
62 Boudet et al. 2016.
63 Williams, McEwen, and Quinn 2017.
64 Wynes and Nicholas 2017.
65 Westlake 2017.

This is true also for scientists.[66] We seem to have little lenience with hypocrisy and are allergic to that type of fraudulent behaviour.[67]

The social dimension is important for many reasons, including its relation to the larger issue of knowledge and insight. We generally consider insight to follow from knowledge and action to follow from insight. This survey, however, highlights some of the complexities hidden by that assumption.

Is it possible that you in fact only gain insight when it is possible for you to act in accordance with it? Prior to the insight, a number of arguments are used to overcome cognitive dissonance and continue as before. We would like to suggest that the group or the example of someone else can enable people to digest and internalise knowledge which in turn can lead to a realisation or an insight that is so compelling that it forces action. Thus, relating to knowledge and acting on its consequences is easier if the result is not social isolation.

This is in line with research stating that it is more important to belong to a group than to be right.[68] Reasoning and rationality is deeply social and tied to our social context. This builds on the existence of so-called cultural cognition or politically motivated reasoning, which states that you receive and digest knowledge in relation to the consequences it might have for your social belonging.[69]

The idea that morality is also social might be slightly more challenging. However, it has been claimed that it is shaped by context and that arguments for a specific standpoint come afterwards, rather than the other way around.[70] This would mean that a new moral standpoint is promoted and made possible in a new social context.

Shame enters this survey silently and with less fanfare than the public discourse might have you believe. We simply find few traces of it. One reason for this might be that those who have stopped flying no longer feel shame because it only comes out of a moral dissonance in relation to your context. Respondents talked about what made them stop flying, and it is ten times as common to invoke what we have classified as conscience than what we have classified as

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66 Attari, Krantz, and Weber 2016.
67 Jordan et al. 2017.
68 Mercier and Sperber 2017.
69 Kahan 2016.
70 Haidt 2001; Mercier and Sperber 2017.

shame. The same proportions surface when we do a quantitative search of the terms themselves. It should be noted that we analysed people's own understanding of shame, guilt and conscience and took them at face value. We did not ask them to define what they mean with the different terms but interpreted their answers in relation to our methodology.

However, we first asked people to choose their main reasons from a pre-selected set before they went on to give their personal argument. There, 20 per cent gave shame as a reason, and 30 per cent chose conscience. It is hard to draw conclusions from this, but it might be that shame played a part, but was not the most important issue. It might also be easier to acknowledge shame when asked than to point it out by yourself. Finally, shame is less likely to be part of your self-image. Still, it has taken a central position in the public discourse, not only through the debate itself but also through public shaming of, for example, influencers who boast about their excessive flying.[71] To really understand shame in relation to decreased flying in Sweden, more research is needed.

Building on rhetorical theory, however, we suggest that the apologetic articles published in early 2018 – mentioned by several of our respondents – were successful because they managed to engage so many empathetically. The writers' own self-betrayal, the conflict between knowledge and action and the honest recognition of guilt helped people to identify. The position of the writers was one of imperfection, which did not raise resistance in others. This position is key when trying to bridge gaps of disagreement.

A rejection of shame as a means to change behaviour also stems from the idea that moralising is something that puts responsibility on the individual, rather than society. A related argument suggests that it is the system which needs to change, rather than individuals. The dichotomy between individual and collective action is then polarised where one excludes the other. This mode of reasoning is common in our broader study on how people legitimise their lack of behavioural change and among those who continue flying.[72]

In our sample, blaming the system – that is, someone else – is rather uncom-

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71 Instagram / @aningslosainfluencers
72 Forthcoming. This is also confirmed by Jacobsson 2018.

mon. Those who have stopped flying indeed regard themselves as having the possibility to act and being important as individuals (which does not necessarily mean that they preclude a more general responsibility from politicians or social institutions). [73]

This is truly interesting for many reasons, but primarily in relation to efficacy. To continuously claim that individual behaviour is of no importance is false. Reduced flying behaviour can decrease the individual carbon footprint massively, but the effect on the climate crisis is of course small, even though every kilo counts. However, many individuals organising to change behaviour can have high effect.[74] Social movements are made up of individuals, acting collectively. To ignore that is to disregard the opportunity for change that these people offer in their engagement and action. Moreover, as this group grows, they will be an important electoral constituency. In fact, social movements and individuals are key to system change.[75]

> Public debate and social media have put climate change on people's agendas, making it something to relate to and talk about. It has allowed for identification with others who have changed and offers support in making tough decisions. Role models are also important and need to be consistent and practise what they preach. Social movements allow people to reassess their knowledge and proceed to action.

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73 Büchs 2017.
74 Centola et al. 2018; Chenoweth and Stephan 2011.
75 Cassegård et al. 2017.

Alternatives exist

Roughly one in eight of our respondents stressed the existing alternatives as an important reason that made them stop flying. Trains are mentioned most often, but also ferries and cars. A few abstain from travelling altogether. Social media can convey these alternatives, but there might also be specific people who act as role models in showing the way.

'Travelling by train inspired me'

Many stress that travelling by train has specific qualities. The trip itself is the end, rather than just the means. It is also social in a different way – it allows for views and contains moments of excitement. Some also rediscover travelling by train and yet others place it in contrast to flying:

> I chose the train and it gave me so much more. New friends, a possibility to relax.

> I had forgotten how fun it is to travel by train.

The time perspective is of interest in this group, as it is brought forward as something positive. The fact that it takes longer is not held against the train ride, but in fact given as a positive:

> We like the slow travel, we like train stations, we like to plan together with the [a specific] travel agency, we like not to burden climate further.

> Trains are nicer. I prefer the tempo and think it is both more adventurous and pleasant.

> You do not gain time through flying, but loose a future for coming generations

The slower travel is coupled with an idea of presence and attention and put in stark contrast to faster and more stressful travel. In some of the responses the declared merits of travelling by train also include a renegotiation of values connected to mobility and a return to former pleasures. This is not surprising, and perhaps says something about how people function in general. When a beha-

viour you like is no longer possible, you try to find agreeable dimensions in the new behaviour. Sometimes, however, that process can be painful:

> *The insight that flying is wrong leads me pretty naturally to upgrade the alternatives, for example vacation at home and train travel in Europe.*

> *I realised finally that it would work anyway, even if I could not fly. First I felt I did not want to let go and the thought of never flying again made me sad. But it feels totally OK now.*

'Went on an interrail last year and was positively surprised.'

Many express surprise that train travel actually works. This can be explained by the national media reporting problems in the railway system, including delays and cancellations. The difficulty of booking international trips has also received some media attention. In that light, people are sometimes astonished and positively surprised:

> *It is super easy to book, contrary to what has been said in media.*

> *After I had looked for alternative national train routes and saw that also international train routes were improving, the decision was simple.*

'There are really good destinations within train distance'

Several responses express that their decision to stop flying has made them discover things close by:

> *There is more to be seen in Europe than I ever will have time for in my lifetime. I am thinking, start with Sweden.*

> *Vacation in Sweden instead. Simpler, cheaper, nicer!*

This new idea of remaining in Sweden have given rise to two new words in the Swedish language that play on vacation (*semester*): *hemester*, meaning taking a vacation at home (*hem*); and *svemester*, taking vacation in Sweden (*Sverige*).

'To fly is transport, not experience'

Alternatives can be a positive pull, but negative experiences can also be a push away from flying. Some of our respondents refer to the actual flying itself. Sometimes it is connected to a culture of travelling that you do not want to be a part of. Other times that last flight produced climate angst:

> *On my last trip, I saw how dirty they had become, the tourist destinations.*

> *Flying is un-free, all the controls, procedures of checking in, being stuck, difficult to go to the bathroom, food when somebody else decides etc.*

There are also instances of inconvenience of a grander type and at times there are worries about security and malfunctioning equipment. This can be connected to consumerism and market demands on the sector. Sometimes people are simply afraid of flying and feel relieved that it is finally okay to say "no" for other legitimate reasons:

> *Two emergency landings due to a failed hydraulic system, one trip in 40 degrees without a toilet due to failed APU [auxiliary power unit]. That was enough scary statistics to start questioning safety – I was aware of the environmental problem since before.*

> *I am afraid of flying so I am really happy to have other arguments to escape it.*

Discussion

Social media has not only led people in our study abstain from flying – it has allowed them to discover alternatives. In particular, a Facebook group called Train Vacation stands out. Here, members tell stories about their train travel and give each other advice on routes and bookings. In general, it matters what others say and do. In contexts where others talk about their worries, support is provided for those who want to change.

Alternatives are very a powerful force in changing behaviour, as you are not so much left without flying, but rather offered train rides. Thus, the existence of alternatives re-enforces the original intention not to fly. This can be regarded a kind of politically motivated reasoning occurring internally. You find the rea-

sons for not flying in arguments for doing something else. This also offers an opportunity to reassess your values and embrace new ideas. Sometimes these new ideas are in fact parts of yourself that you have forgotten about and are happy to rediscover.

Moreover, people's experience of trains leaving on time is more positive than the media might have you believe. It is not as difficult to manage a train trip as some people argue. In general, information about the practicalities of alternative travel is important for those who want to make the move towards more sustainable travel.

> ❯ Alternative travel can help a decision to stop flying, but it can also support an alternative lifestyle and understanding. It matters that alternatives work and come at a reasonable cost in relation to time, money, reliability and convenience.

Things preventing behavioural change and how they are overcome

After going through all the reasons to stop flying, it might look as if it has been an easy choice for the respondents. This, however, seems to be true for very few. Some claim or suggest that, once the decision was made, it was obvious, simple or resulted in other positive consequences. However, for many it took time to move from knowledge to insight and from insight to behavioural change. The decision was painful for many: in our survey we asked if there was something that made it difficult or prevented them from changing. About 45 per cent said yes, and almost as many were specific in their answers.

The most common obstacle mentioned in the responses was social pressure:

Friends and family who do not understand, who want to fly, who question.

Children who want to go to Crete for example.

Peer pressure.

People get really upset when I tell them I have stopped flying, because they feel guilty.

The norm to travel and fly a lot. To be one of few who thinks differently. It became sort of a discussion of betrayal.

The flying norm is strong, as the general answers also testify. This is true both in the personal and individual context.

Around 15 per cent mention expectations from work, studies and other commitments – a form of social pressure to uphold norms. Related to this are the answers that have to do with ideas and customs, way of life and how you identify yourself:

> *Habit and the "conventional" practice in my context.*

> *Surfing in exotic places and snowboard in the Alps were part of my lifestyle.*

Social pressure in the immediate environment was the most common hindrance; giving up something valuable was the second most common answer:

> *You miss fun stuff that really cannot be done.*

> *The feeling that you say no to pleasure and that you "sacrifice" something without knowing what you get back, concretely.*

> *It was hard since my illness is eased by heat and sun, and the fact that I love travelling.*

> *I love to travel and to fly.*

These obstacles present another dimension to the process of stopping. We also find answers to this question that deal with friends and loved ones in other countries, mentioned by around 20 per cent of respondents. It is likely that this is the most difficult thing to give up, and hence those who have loved ones far away might not be willing to promise never to fly again, and are therefore not in our sample.

> *I have family in the Philippines. To give up flying would mean to give up seeing them in the future.*

There are also arguments that stress the inconvenience of stopping. This can pertain to time, money or convenience:

It is often cheaper to fly than to take the train.

Other alternatives have been too awkward.

No one in our study mentioned the air tax introduced in Sweden April 1ˢᵗ 2018 as a reason for reduced flying. One conclusion is that for this group, the economic argument did not help them to stop. On the contrary, respondents mentioned the low cost of flying compared to the alternatives as an obstacle to quit flying.

Finally, there is an argument which is very common when non-action is being justified, but less common in this group. It is the "everybody else" argument:

The majority continue to fly.

That others fly as before and don't realise the seriousness of the consequences.

The social barrier and external expectations are by far the most common hindrance to change, for almost 70 per cent of respondents. Thus, the norm to fly appears more important than the potential social pressure of *flygskam*. Still, in our survey the respondents have overcome the norm – the question is, how?

The most frequent answer is that they negotiated with their social environment, or that they simply ignored it. Others applied specific strategies, for example by reframing the issue. One such example was to "do the right thing"; another was the future of the children. Others explored alternatives. Some instead sought out a social context that was supportive, rather than remaining in one that was not.

At times the greatest hindrance to our respondents was within themselves, and one way of overcoming this was to find new thought structures or to develop better arguments. The thinking around climate change and action was thus further developed. To accept the situation and instead welcome the sorrow was also a way to overcome a hindrance that was mostly personal.

To gradually reduce and make compromises with those around you was also a strategy, whereas others simply decided. There is an interesting tension between these last two ways: they seem mutually exclusive. You cannot com-

promise and do it gradually and at the same time decide to quit now. However, much would be gained if the issue was not thought of as a dichotomy. For some, it is easier to simply stop altogether. For others, that is not easy, and for them, reducing should still be an option. If we just look at emissions, the yield would probably be much higher if the majority reduced than if the minority quit altogether.

Beyond flygskam – concluding remarks and ways forward

Flying is under reconsideration and reinterpretation. Its value and meaning are changing as more and more people realise the environmental consequences. We have looked at people who have stopped flying and we can see how their reasoning is influenced by the public discourse. This is an opportunity that might prove valuable for a wider discussion on how to reach the goals set in the Paris Agreement. We can learn from this.

Those who have answered our survey give *flygskam* hardly any credit for their decision. Instead, the most common reason to change behaviour is increased knowledge and insight. This insight seems to occur not just with the accumulation of knowledge, but also in connection to a realisation of the urgency. This realisation can come from personal experience of climate change, often related to strong feelings and fear. However, our respondents also stress the importance of their conscience and the ambition to be consistent. They want to do the right thing because they regard the climate crisis to be a moral issue and a matter of justice. This idea of justice is not only in relation to others, but also to future generations, and forces respondents to ask: "Why should my pleasures contribute to ruining somebody else's future?"

The public discussion on climate change and flying has affected this group, and their social context is important to their decision to stop flying. They are

inspired by others who have shared their knowledge, set an example or led the way. The children are their beacons but also their future judges. Support from family and friends is vital to enabling this new practice. Alternatives to flying, like taking the train, are a way to change behaviour and can furthermore sustain a decision with other positive values. Other modes of travel or even abstaining from travelling altogether are seen as more valuable and desirable.

To quit flying is no easy thing – as our respondents testify. On the contrary, there are numerous reasons to continue the practice, which has become tightly linked to the private and professional lives of many high and medium-income groups. Still, our respondents have stopped. We suggest that investigating their reasons is worthwhile, as it adds to our knowledge on how change can happen.

Arguably, the public discourse is focused on why people cannot change and how "irrational" behaviour is overpowering "rational" behaviour to save the planet. Therefore, to analyse groups that *do change* contributes missing information: our respondents feel that their actions matter, they have a sense of justice, they are knowledgeable, they look for good practice and strive to be an example to others.

We are certainly not suggesting that these capacities are limited to people who have stopped flying. Nor are we suggesting that all our respondents possess all the capacities listed above. However, the ideas and thoughts put forward by these respondents contribute to the general understanding of how a transition to a sustainable society can happen.

It is important to realise that there are goal conflicts that are not solved by the decision to stop flying: it is still a wicked problem. The possibility to meet other people far away is not a matter of negotiation or knowledge, and will always be an issue. Some of our respondents are making sacrifices that they believe the climate crisis demands. This is noteworthy and should be taken seriously. To allow flying to continue in a way that disregards the damaging impacts on our planet and future generations is challenging for many reasons, not least the ethical ones. Moreover, the patience of those who gave up flying and paid a personal price, might be limited in the face of dormant regulatory bodies. To quickly reassess the terms for flying is imperative to reduce emissions in the

long term, but it is also vital if this movement is to spread and have long-term effects.

Many stress the importance of knowledge and the proportions between different emissions. Climate impact markings of consumer goods, tools for measurement and climate calculators have all been mentioned. It is clear that a good, alternative unit of measurement for CO_2 emissions would be useful in translating this gas into something tangible. If the name was convincing and transparent it would also catch on more easily. To use the average expected emission quota per capita if the targets set in the Paris Agreement is to be met is one idea. This would be a figure that would change with time depending on how successful our efforts are.

This translational process does not have to be confined to CO_2 – it can also involve energy consumption and production of waste. Figures can be incorporated into climate calculators that can be handy for those who want to know more. To have aggregated, comparable and transparent information is a general issue that should be addressed on a European level, allowing for increased knowledge on climate change among all citizens of the European Union.

Children are often mentioned in our material, both for moral and educational reasons. Tightly connected to the issue of information is the importance of educating children in issues pertaining to climate change. Not only do they need to know the basics of the environment and climate change in the natural system, but also their consequences in society. However, perhaps even more pressing is to educate them on what must be done and how it can be achieved. This is not only important because action on their behalf is also needed, nor that they are important change agents in their own families. It is important to couple dire information on climate change with possible ways forward, and to make knowledge motivational.

Once upon a time the European railroads were the newest in the world. The speed at which people could travel was regarded extraordinary, and the standardisation of time became necessary. New cities formed along the railroad and international exchange increased. There is a new interest in travelling by train and this is an opportunity for European regulation and policy. To improve train

travel in all its dimensions is likely the most agreeable way to support a movement which wants to reduce flight emissions. It isn't just the infrastructure that is important: options to book internationally, the provision of smooth transfers, luggage storage at stations, up-to-date information and competitive prices are all factors that can contribute to making trains the first choice, ahead of flying. There might be few shortcuts to lowering emissions, but to offer alternatives to flying by modernising and expanding rail traffic is not a detour – it will put us on the right track.

The Swedish example is a case study that is of importance for Europe as a whole. There are certainly national differences. However, we are all committed to the Paris Agreement and emissions need to go down drastically. The flying sector is low hanging fruit not only for Sweden. On the contrary, it can be argued that some of the flying in Europe is much easier to exchange in parts of Europe where distances are shorter. Moreover, the group that we have investigated is not isolated to Sweden. There are many European citizens that want to live a sustainable life and find themselves in goal conflicts that pertain to climate change and their daily life. Private flying is one such goal conflict, which comprises ideas of freedom and progress but at the same time poses great threat to climate change.

In this study, we have focused on the reasoning of individuals. This does not mean that we regard climate mitigation a solely individual problem. Rather, this and other studies show, that the individual level, the social context and systems and structures interact in complex ways. This means that those who voluntarily try and make an effort towards a sustainable society must be supported by structural change. There is much potential, we argue, in enabling those who want to change. They can be the pilots of the future.

Appendix A:
Everything you always wanted to know about flying, but were too afraid to ask

Climate effects and distribution of flying

Commercial aviation accounts for about 2.6 per cent of global CO_2 emissions. If the high-altitude effect is included, it is at least 3–4 per cent of the total anthropogenic climate impact. To date, flying has increased by 4–5 per cent per year. If the rate of increase does not slow down, and if other sectors comply with the 2°C target emission pathways, aviation will account for between 20 and 25 per cent of global greenhouse gas emissions by 2050.[76] In Europe and the US, however, we are seeing a declining trend, and in Sweden flying is decreasing both domestically and abroad.[77]

The total impact of commercial aviation – between 3 and 4 per cent – may not appear much, but in many countries in Europe it is significantly more. In Sweden, for example, flying accounts for about 10 per cent of residents' emissions, which is as much as is caused by all passenger car traffic on Sweden's roads. 80 per cent of flights in Sweden are private.[78]

Flying is unevenly distributed. The most affluent half of Earth's population

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76 Cames et al. 2015.
77 Swedavia 2019. During 2018 the increase leveled out and from January to September 2019 there was a total decrease of 4 per cent. This should be compared to an increase of between 3 and 7 per cent per year from 2012 to 2017.
78 Kamb and Larsson 2019.

accounts for about 90 per cent of air-related emissions.[79] In Sweden, for example, we fly more than five times as much as the global average.[80] Together with the US and China, the EU are the biggest emitters.[81]

The climate effects of greenhouse gases are almost inversely distributed, and hit countries whose populations fly the least.[82] During a year, 3 per cent of the global population fly; in countries like Sweden, however, up to 80 per cent fly regularly. But flying is unevenly distributed even in Sweden. About 20 per cent of the population are responsible for more than half of the emissions from flying.[83] For many frequent flyers, flying represents their largest source of climate impact by far. Studies from other European countries show similar patterns. Furthermore, a small but growing elite's extreme flying habits stand for a disproportionate amount of emissions.[84]

Below are examples of common flight trips and their emissions. These include the high-altitude effect, as well as emissions from fuel production, but not other lifecycle emissions related to the production of planes or infrastructure.[85]

- Brussels – New York, 1.9 tonnes;
- London – Hong Kong, 3.1 tonnes;
- Stockholm – Phuket (Thailand), 2.8 tonnes;
- Oslo – Lisbon, 0.9 tonnes (compared with 0.3 by train); and
- Paris – Lyon, 0.13 tonnes (compared with 0.04 by train).

Flying emissions can be compared with the total per capita emissions needed to achieve the targets set in the Paris Agreement, which according to the IPCC-report 2018 is less than 3-4 tonnes by 2030 and 1 tonne 2050.[86] It is important to note that all this is not available for private consumption.

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79 Graver 2018.
80 Kamb and Larsson 2019.
81 Graver 2018.
82 Otto et al. 2019.
83 Larsson 2015.
84 Gössling 2019.
85 As calculated by https://travelandclimate.org/, a calculator developed by researchers at Chalmers Institute of Technology. The same group has developed https://flightemissionmap.org/, a visual tool that shows emissions from selected distances.
86 According to the IPCC report (2018), this is less than 3–4 tonnes by 2030 and 1 tonne 2050. Masson-Delmotte et al. 2018.

The high-altitude effect

Flights that take place over a certain altitude produce an extra climate impact in addition to the carbon dioxide, due to water vapour, nitrogen oxides, aerosols and soot. The *high-altitude effect* or, as it is often called in scientific literature, *the non-CO$_2$ effect*, occurs when the plane flies so high that condensation strips are produced. These layers of emissions reflect the Earth's heat radiation, and some of them take decades and even centuries to decompose. It is noteworthy that biofuels also have an impact. The most widely accepted research on the high-altitude effect speaks of roughly a doubled climate impact.[87]

The conditions of the aviation industry

Airlines do not pay tax on fuel due to bilateral agreements based on the Chicago Convention from 1944. This convention is also the base for a recommendation to prohibit taxation of aviation fuel for international use by the United Nations Civil Aviation Organization. This order is now being criticised, with the argument that nothing prevents member states from negotiating to remove the obstacles to taxation. In a growing number of countries, various forms of taxation and fees are now being discussed in order to create fair conditions between aviation and tax-paying transport sectors. Countries such as Sweden, Germany and France have already introduced some air tax (in the form of a fuel tax or a tax on tickets). However, a lack of international agreement might result in skewed competition. In Sweden, opinion on aviation tax is increasing. 70 per cent of Swedes want air tax, and believe that the revenue should be invested in railways.[88]

International aviation was exempt in the Kyoto protocol, signed in 1997 and effective from 2005. In 2013, it was decided that the International Civil Aviation Organization (ICAO) should develop a global market-based system to manage the climate impact of international aviation. In 2016 a system called CORSIA was decided upon. According to this system, emissions are allowed to increase

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87 Azar and Johansson 2012; Lee et al. 2010; Kamb and Larsson 2019.
88 Survey by SvD/Sifo published 18 March 2019. Suni 2018.

until 2020, after which airlines must purchase emissions credits to compensate for their climate impact via reductions in other sectors. CORSIA begins with a voluntary phase, which is replaced by a mandatory phase from 2027, when all ICAO members above a certain level of international aviation must participate. Airlines must monitor and account for their emissions. However, CORSIA lacks targets for today's emissions. The high-altitude effect is not taken into account and only the increase from 2020 will be compensated for by the purchase of emissions credits. The goal is thus not to reduce emissions in absolute terms, only in relation to a particular reference scenario. The agreement is thus not aligned with the 2015 Paris Agreement.

Within the EU, CO_2 emissions from aviation are included in the EU emissions trading system (EU ETS). All airlines operating in Europe receive a certain amount of emission allowances for one year. They are obliged to measure and report their emissions and to redeem corresponding emission rights. This system has reduced emissions from the sector, but not nearly enough to make up for the increase in flights. International aviation outside the European Economic Area is currently not part of the EU ETS, and therefore not part of the division of responsibilities between participant countries.

Appendix B:
Method and data

This qualitative survey was carried out using the tool SurveyMonkey, adhering to the terms of the EU's rules about data management (GDPR). We posted the survey in certain specific climate-engaged groups on Facebook and circulated it on Twitter. The survey was open between 29 May and 12 August 2019, with the vast majority of responses sent in the first week. Our conclusions build on the pre-selected choices and the open answers of the self-selected respondents. We received over 900 responses, but had to discard some as they were incomplete. A total of 875 respondents answered questions 1–6, and were thus included in the dataset. Of these, 673 chose to relate their process in their own words.

After a GDPR question, the survey started with four questions asking whether respondents had stopped or reduced flying, and if so when. Respondents were then asked if they had stopped private or work-related flying. The next question (Q6) offered a number of pre-selected reasons why the respondent chose to stop flying. The key question (Q7) in the survey then asked how it happened, which was an open-text question. It is from the narratives and stories that people shared in Q7 that we draw most of our conclusions and extract most of our quotes. Then followed two questions that dealt with insight and attitude and change. We then asked if something made it hard to change (Q10); and if so, how that was overcome (Q11); and what was the most important reason for them to

quit (Q12). The remaining three questions related to gender, age and education.

This research is qualitative in character, which means that we do not claim our results to be statistically significant or that our data is representative of Swedish society. We wanted to better understand people that have voluntarily stopped or substantially reduced flying because of its climate change impact. We therefore published the survey in climate engaged social media groups where such people were expected to be present and asked those who had quit or reduced their flying to respond. Our claims are made in relation to this very limited and specific group which means that we cannot say anything about climate engaged people who have not decreased their flying or about those who have quit flying for other reasons. In this primarily qualitative material, however, some thought structures are more prominent than others. We believe this is important to highlight, and therefore we sometimes indicate approximate proportions, even though the main conclusions of our research are not quantities.

It cannot be precluded that the preselected answers of Q6 might have influenced the answers in Q7. We still found the layout relevant in order to discern the interaction between different factors. It allows us to compare the preselection with the personal narrative. We cannot know for sure that the reasoning that our informants have accounted for in every way corresponds with how they really reasoned in the moment.

The overarching methodology is phenomenographic and topical. Phenomenography is a qualitative and interpretive method used when you are not primarily interested in a general average, but rather how differently people experience and think about a phenomenon and how that is expressed linguistically.[89] The aim is to capture the span of possible views on an issue or question.

Within phenomenography interviews are often used, however, we have instead worked with open questions from a survey. The material has been analysed through a structured search for recurring themes according to *topos* theory. *Topos* is a term from Aristotelian rhetoric theory and means a recurring argument to motivate something.[90] It might be a basic value, like *the future of our children*; a thought structure, like *you should practice what you preach*; or

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89 Marton and Booth 2000.
90 Wolrath Söderberg 2017; Wolrath Söderberg 2012.

argumentative operations, like *comparing different emissions*. This kind of analysis is akin to discourse analysis, but focuses on motivation, legitimation and refutation and thus fits well when you want to investigate negotiations or issues where there are contradicting arguments. We have at times also looked at specific words, like "shame" or "conscience" but not asked respondents to define them. However, for a response to be grouped among those pertaining to moral issues, the term itself does not have to be mentioned.

Our point of departure is that people experience the goal conflict "to fly or not to fly", and that this experience results in an internal negotiation, which can be analysed. The *topoi* we found were grouped in larger clusters of related *topoi*. Topical analysis has recently been used in other studies of sustainability issues.[91]

The quotes we have chosen in this report illustrate specific thought structures, ideas, arguments, rationalisations and legitimisations that surface in the respondents' own stories. Often the responses are quite long, and we have picked the parts that relate to a specific theme and translated them from Swedish to English. We have sometimes edited sentences that lack a subject or are misspelled. Sometimes we have made a full sentence out of a subclause. We have never altered the meaning of a statement.

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91 Ross 2017; Walsh and Boyle 2017.

Acknowledgements

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Grounded
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Flygskam. This Swedish word, which translates as "flight shame", has spread across the world. It is symbolic of a movement in which people are choosing not to fly. Air travels contribution to European carbon emissions is growing, and presents an increasingly important climate threat. Yet limiting flying is a challenge to the liberal idea of free movement, and a high degree of mobility has long been an important European ideal vital to the integration of the union.

With that background, this book explores the motivations of those who voluntarily stay on the ground, and tells the stories of why people have chosen to stop flying. The authors' analysis reveals that for this selected group, insight about the seriousness of climate change and knowledge about the impact of their own behavioural choices is crucial. Moreover, their social context is key to the behavioural change.

Children play a central role in the book, both for moral and educational reasons. Tightly connected to the importance of educating children in issues pertaining to climate change is people as role models. Perhaps encouraging, the people in this study feel that their actions matter: They have a sense of justice, they are knowledgeable, and strive to be an example to others. Social movements are opportunities for political change. There is therefore much to learn from the group of people who stop flying.

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