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Flying less, mobility practices, and well-being: lessons from the COVID-19 pandemic in Norway

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ABSTRACT

This article uses a mixed-methods design to study flight-intensive practices in Norway. It explores how practices changed as a consequence of the travel restrictions implemented to limit the spread of the COVID-19 pandemic and the implications for people's well-being. Norway is one of the European countries where people take the most flights per capita and the expectation is for air traffic to increase by approximately 4% annually from pre-pandemic levels. Notwithstanding the industry's goal of becoming fossil-free by 2050, the rapid reduction of emissions to keep global warming at 1.5°C below pre-industrial levels is unlikely to happen without restrictions in air travel. The article draws on social practice and well-being perspectives to investigate the possibility of flying less in post-pandemic times. Using survey data and regression analysis, the study analyzes the infrastructures, norms, values, resources, and competencies associated with reductions in pre-pandemic air travel. Engaging in walking and cycling and taking collective transport for short-distance travel were found to correlate with flying less for long distances. In-depth interviews with domestic travelers suggest that flying less for work might be a synergic satisfier as it contributes to more than one human need without hampering any others. This has implications for the well-being of people who engage in flight-intensive practices for work as it will likely be enhanced if work-related travel is significantly reduced when the COVID-19 pandemic is over.

Introduction

This article explores changes in flight-intensive practices as a consequence of the travel restrictions implemented to limit the spread of the COVID-19 pandemic in Norway and their implications for well-being. It focuses on three strategies that have inspired many initiatives to reduce air travel: replacing flights with low-carbon alternatives, videoconferencing, and traveling less (Sahakian et al. 2021). In Norway, prior to the pandemic, the public debate about reducing air travel revolved mostly around the potential of switching to electric airplanes in the future and the use of biofuels but did not address measures to decrease demand (Aamaas and Peters 2017). Trains were considered inefficient and videoconferencing was only marginally used to replace meetings or conferences (Denstadli 2004; Denstadli et al. 2008). Thus, arguments maintaining that measures to fly less or to stop flying entirely were politically impracticable and socially unacceptable have dominated discourses of air travel in the country.[1] This is not surprising as Norway is sparsely populated, with a meager rail network and high levels of wealth, and both points have been used to justify the fact that Norwegians are among the Europeans with the highest per capita carbon-dioxide (CO_2) emissions due to aviation (Hopkinson and Cairns 2020). This situation is likely to limit the popularity of air-travel reductions as a way to reduce environmental impact (Aamaas and Peters 2017).

Against the projected 4% expansion of air travel in 2016–2022 (Madslien et al. 2017), the unprecedented restrictions to mobility in Norway beginning on May 14, 2020, due to the COVID-19 pandemic caused a 55% drop in domestic flights and a 90% reduction in international flights in 2020. Consequently, CO_2 emissions from air travel plunged 60%, and this decline was not replaced by an equivalent rise in emissions from cars or other carbon-emitting transport modes.[2] Norwegians were advised against using public and collective transport

systems, which also resulted in a sharp reduction in train and bus journeys during 2020.[3] Simultaneously, as the government recommended working from home and avoiding social interactions, videoconferencing as a practice to engage in work-related encounters became consolidated across the country. A reduction in air travel, accomplished by traveling less and videoconferencing, became a fact in 2020 and, surprisingly, was endorsed by most Norwegians despite previous debates over air travel.[4]

This article uses a mixed-methods design to explore the elements supporting a reduction in air travel in the context of the measures implemented to limit the spread of the COVID-19 outbreak in Norway. It is articulated around two main research goals: The first concerns an exploration of reduced air travel by accounting for the infrastructure, norms and skills, competencies, and resources that shape mobility practices. The second investigates the possibility of flying less in post-pandemic times by analyzing the well-being implications of changes in the elements of work, leisure, and family-related practices during the COVID-19 crisis. The latter draws on an emerging body of literature focusing on sustainable mobility, including a reduction in air travel and its positive effects on health and well-being (Cohen and Kantenbacher 2020; Guillen-Royo et al. 2022; Mattioli 2016). The possibility of flying less being a *synergic satisfier*, meeting several needs and not hampering any others, is also explored. The empirical analysis draws on quantitative data to investigate the elements of practices shaping air-travel reductions in Norway before the pandemic and on qualitative data from in-depth interviews with Norwegian travelers to understand changes in flight-intensive practices in the pandemic period.

The following discussion is organized as follows. It begins by presenting practice-theoretical perspectives on sustainable mobility and discusses need-based approaches to well-being. Next, it introduces the conceptual framework, research questions, mixed-methods methodology, and data used for the empirical analysis. Findings are presented in two sections. The first describes the results of a regression analysis of practice-related elements that correlate with the decision to fly less in pre-pandemic Norway. The second section draws on interview data to assess how flying less for work, leisure, and family purposes during the COVID-19 pandemic influenced the well-being of participants. The final section summarizes the findings and relates them to the current literature on reduced air travel as well as to policies that could sustain this trend in the post-pandemic period.

Flying less and social practice perspectives

Flying has become an integral part of societal practices, some of them as frequent as commuting to work and others more sporadic, such as visiting close family and friends (Mattioli et al. 2021; Sahakian et al. 2021). According to Mattioli and Adeel (2021), whether certain flights fall into the category of short- or long-distance travel (LDT) is not defined equally across countries or disciplines. For example, for a trip to qualify as LDT in the tourist sector, it should include an overnight stay, while distance traveled would be the measure chosen in sociological or epidemiological studies (Lian and Denstadli 2004; Mattioli et al. 2021; Randles and Mander 2009). Despite these disparities, there seems to be a consensus in the literature that, increasingly, people have begun to rely on inexpensive flights and rapid access to airport infrastructure for leisure, family, and work. In wealthy countries, even everyday practices – such as shopping, attending sporting or business events, engaging in family celebrations, or exercising (including climbing, skiing, and golfing) – are often associated with taking a flight (Faulconbridge et al. 2020; Greene and Rau 2018; Randles and Mander 2009).

A growing body of literature analyzes consumption using practice-theoretical perspectives. These approaches bypass the traditional structure-agency dichotomy in the social sciences and go beyond a focus on the individual to inform policy and support social change (Sahakian et al. 2021). Social practices are generally defined as "routinized type[s] of behaviors" such as commuting, grocery shopping, showering, cooking, or taking holiday trips. Practices are shaped by a wide array of elements associated with people's lifestyles and existing socio-technical structures (Reckwitz 2002; Spaargaren 2003). There are many perspectives on the constitutive elements of practice, and different authors emphasize some of them over others. For example, Shove et al. (2012) and Shove and Pantzar (2005) consider *meanings*, as in cultural expectations and conventions; *materials* that encompass technologies, structures, and things; and *competence*, including embodied skills and knowledge as the constituent elements of practices. Other authors, such as Kennedy et al. (2013), understand practices in terms of the interplay of social, cultural, and economic resources, skills, norms, and infrastructures that shape them.[5]

The way in which practices evolve and dissolve depends on the interplay of the elements that constitute, shape, or support them but also on their co-evolution with other social practices. As Shove et al. (2015) observe, "Forms of energy consumption, including those associated with automobility, are

usefully understood as outcomes of interconnected patterns of social practices, including shopping, visiting friends and family, going to school, and so forth." This is particularly important, as the normative change induced by the COVID-19 pandemic, for example, has affected everything from practices linked to commuting to practices associated with exercising, shopping, and visiting new places. Additionally, in the context of sustainable mobility, Watson (2012) highlights the importance of studying how practices bundle together as well as how the elements of practices and the process of recruiting practitioners evolve.

A growing array of scholars has drawn on social practice approaches to study urban mobility by car or motorcycle and their sustainable alternatives, such as the use of public transport, car-sharing, cycling, and walking (Greene and Rau 2018; Hansen 2017; Kennedy et al. 2013; Kent and Dowling 2013; Watson 2012). Concerning air travel, perspectives other than practice-theoretical approaches have been more popular in the literature. Generally, when focusing on behavioral change, research has addressed attitudes and values supporting air-travel reduction (Büchs 2016; Whitmarsh and O'Neill 2010); incentives and barriers to reducing flights at the individual and societal levels (Frändberg 2014; Jacobson et al. 2020; Mattioli et al. 2021); the attitude-behavior gap (Kroesen 2013); the normative framework that associates flying with necessities (Gösling et al. 2019); and the factors that determine popular support for air-travel restrictions (Kallbekken and Saelen 2021); among other topics. Recently, several studies have drawn on social practice approaches to study air travel and its low-carbon alternatives such as train travel, videoconferences, or simply less travel overall (Luzecka 2016; Randles and Mander 2009; Sahakian et al. 2021).

In general, the literature on flying less finds that *infrastructures* – such as airports, roads, and train and bus stations – and the *technologies* that facilitate remote working and virtual exchanges – are important elements of practice shaping the decision to fly (Jacobson et al. 2020; Mattioli et al. 2021; Sahakian et al. 2021). Characteristics of trains and buses relating to workspace, cleanliness, and comfort might also be considered infrastructural elements that increase the likelihood of flying less (Sahakian et al. 2021). Concerning *skills and competences*, learning the skills of "slow travel" and engaging in the practice appears to promote low-carbon alternatives to flying (Sahakian et al. 2021). Additionally, the acquisition of digital skills for virtual exchanges is also found to support a reduction in air travel (Denstadli 2004; Mattioli 2016).

Regarding *values and norms*, extant studies find that strengthening pro-environmental or intrinsic values and implementing regulations forcing businesses to count travel time as working time, for example, have the potential to dissociate everyday practices from air travel (Büchs 2016; Sahakian et al. 2021). Reversing the relatively low price of air travel compared to its putatively more sustainable counterparts by either subsidizing train journeys or by applying higher carbon taxes or levies to frequent fliers could provide the necessary *economic resources* to support low-carbon travel in the future (Jacobson et al. 2020; Sahakian et al. 2021; Hopkinson and Cairns 2020). It, however, merits noting that not all studies find that *cultural resources* such as pro-environmental information and sustainability education influence the decision to fly (e.g., Kroesen 2013). For instance, Kallbekken and Saelen (2021) find that, in Norway, emphasizing the imminence of the effects of climate change might increase people's predisposition to support restrictions on flying.

Sustainable mobility and well-being

It is common to classify well-being approaches as belonging either to the *hedonic* or to the *eudaimonic* tradition. The hedonic perspective links to happiness studies in social psychology, sociology, and economics and understands well-being in terms of feelings, perceptions, and individuals' assessments of their own situation (Frey and Stutzer 2002). Most empirical studies motivated by the hedonic well-being perspective find that sustainable consumption practices, including sustainable mobility, enhance – or at least do not detract – from people's well-being (Guillen-Royo and Wilhite 2015; Kasser 2017). Nevertheless, concerns about social comparison, adaptation, measurement of feelings, and the focus on individual solutions in most happiness studies have resulted in sustainability researchers favoring eudaimonic over hedonic approaches (Büchs and Koch 2017; Brand-Correa and Steinberger 2017).

The eudaimonic perspective follows the Aristotelian conception of a good or virtuous life which is "the state of having an objectively desirable human life," and it is often drawn on in ethics, philosophy, social policy, social psychology, and sustainability studies (Honderich 1995, 252). Eudaimonic perspectives rely on the idea that universal needs or capabilities exist, are satiable, limited, and can be taken to apply across generations (Doyal and Gough 1991; Gough 2017; Max-Neef 1991). The latter is especially important given the environmental toll imposed on future generations by current consumption patterns. Still, the fact that need theories draw on a specific list has often been criticized for being

paternalistic as it is not people, but experts, who usually select what to include as needs (Doyal and Gough 1991). Gough (2014) argues that the openness of most needs approaches to allow experts and users to challenge the list of needs helps refute this claim.

Linking to the eudaimonic tradition, ecological economist Manfred Max-Neef developed a participatory approach to needs that has become popular with sustainability researchers (Max-Neef 1991; Smith and Max-Neef 2011). Here, *needs* are regarded both as prerequisites for a good life and as opportunities for action. The nine fundamental human needs for subsistence, protection, affection, understanding, participation, idleness, creation, identity, and freedom identified by Max-Neef are considered universal. Conversely, need *satisfiers* (the attitudes, behaviors, norms and values, forms of organization, institutional features, social practices, contexts, and characteristics of our physical and natural spaces) are believed to vary across cultures and socioeconomic contexts (Max-Neef 1991). In this framework, satisfiers are not the same as economic goods. As Max-Neef puts it, "While a satisfier is, in an ultimate sense, the way in which a need is expressed, goods are, in a strict sense, the means by which individuals will empower the satisfiers to meet their needs." Thus, concerning mobility, sport-utility vehicles (SUVs), bicycles, or train/bus/plane tickets (*economic goods*) are distinguishable from collective transport, frequent flyer levies, or cycle-lane networks (*satisfiers*), for example (Guillen-Royo, 2020).

Satisfiers can promote or hinder the satisfaction of needs, depending on their articulation and their direct or indirect consequences on need fulfillment now and in the future (Guillen-Royo 2016).[6] Even if it is possible to analyze the links between needs and specific satisfiers or economic goods at the theoretical level, greater internal validity might be achieved by discussing and challenging these connections through participatory methods and dialogue (Max-Neef 1991; Smith and Max-Neef 2011). The latter includes challenging the list of needs, as both wording and meaning can vary across socioeconomic groups and cultures (Guillen-Royo 2016). To date, need-based workshops and dialogue, among other participatory methods, have been used to investigate satisfiers such as housing, renewable energy provision, energy services, and sustainable mobility (Brand-Correa et al. 2018; Centgraf 2018; Guillen-Royo et al. 2022; Guillen-Royo 2016; Mitchell 2001; Smith and Max-Neef 2011).

Concerning mobility, Guillen-Royo et al. (2022) studied short-distance travel and need satisfaction with a group of stakeholders from the northern Norway municipality of Vågan. Participants considered private transport as a satisfier hampering needs fulfillment together with the endemic underinvestment in public services, the exclusion of civil society in policymaking, the predominance of individualistic values, and the perception of current lifestyles as rushed and stressful. Sustainable mobility – as in ridesharing, using collective transport, cycling, and walking – was considered a *synergic satisfier* (supporting the fulfillment of more than one need and not being detrimental for any others). According to participants, sustainable mobility practices could emerge and consolidate when supported by satisfiers such as collectivist values, provision of affordable public transport, the transition toward a low-paced society, and nationwide commitment to climate-change mitigation. Some of the satisfiers shaping sustainable mobility had the attributes of the infrastructure, norms, and resources considered in practice-theoretical perspectives. A reduction in air travel was not debated in the workshops and the issue of whether it hampers or promotes need fulfillment will be explored in the following sections.

COVID-19 pandemic in Norway and the empirical framework of the study

The unparalleled travel restrictions implemented by most governments to fight the spread of COVID-19 resulted in a 78% decline in air-passenger transport in all European Union (EU) countries in 2020.[7] In Norway, the strict pandemic restrictions that were imposed from March 12, 2020 to April 13, 2020 included the closure of nurseries, schools, shopping centers, and fitness studios; the regulation of operations in restaurants; and the cancelation of all sports and cultural events. Government recommendations were to work from home, to avoid public transport, to limit leisure travel, and to quarantine for fourteen days upon entering the country. Borders were closed, although Norwegian citizens could still return from abroad. Beginning in mid-June, international travel restrictions were gradually lifted, but the obligation of a ten-day quarantine for non-work-related travel was retained for some countries following criteria based on national infection rates (Ursin et al. 2020). This strategy proved successful, as COVID-19-related deaths in Norway until June 2021 were 146 per million people compared to 432 in Denmark and 1,399 in Sweden.[8]

Early in the pandemic, the government gave the aviation industry special treatment by granting loan guarantees, eliminating the air-passenger tax from January 1, 2020, to October 31, 2020, and lifting airport charges paid by the carriers until June 30, 2020.[9] Nevertheless, in 2020, stay-at-home

recommendations and travel restrictions resulted in a 61% annual reduction in air traffic and a 40% drop in the number of journeys taken by collective transport, including trains, buses, boats, and underground systems. The reductions in air travel were more pronounced for international flights (92%) compared to domestic flights (57%), with "only" 400,000 international and 3.6 million domestic travelers in the last quarter of 2020. In total, work-related journeys declined by approximately 50%, with a near-total stop in the second quarter of 2020. However, there was an increase of 1.9 million domestic journeys in 2020 over 2019, as most Norwegians spent their holidays in the country and avoided international travel.[10]

Concerning flight-intensive practices, three main questions arise: (1) To what extent were infrastructure, norms and values, resources, and competencies shaping people's engagement in flying less before the COVID-19 outbreak? (2) How were flight-intensive practices transformed as a consequence of the COVID-19 travel restrictions, and (3) How did these changes affect the well-being of travelers? Figure 1 presents the empirical framework of the study. It identifies some of the practices that have increasingly become flight-intensive, the elements of practice considered in most practice-theoretical approaches, and three aspects of flying less. The latter concerns: substituting flights with low-carbon alternatives, videoconferencing, and curtailing travel (Destadli 2004; Jacobson et al. 2020; Sahakian et al. 2021). Social practices, elements of practices, and people's engagement in reducing air travel have been influenced by the (temporary) public-health policies arising from the COVID-19 pandemic. Analyzing these changes and how they have influenced well-being is the main objective of the study.

Methods and data

Survey and quantitative data

The survey was designed as part of a project aimed at studying the relationship between the use of information and communication technologies and well-being in Norway. It included a question on air travel as part of a set of questions on sustainable consumption practices. The survey was administered online in the autumn of 2017 to a representative sample of adults in the country using a stratified sampling technique by gender, age, and geographical region.[11] A total of 2,019 questionnaires were considered valid after weights had been applied to account for the frequency distribution among the Norwegian population of the three criteria used for stratification. The final sample included 49% women and 51% men, with an average age of 48, and the regional distribution followed the general pattern for people over 18 years in Norway in 2017.[12]

A survey question on long-distance travel was used as the dependent variable in the regression analysis presented in the next section and was worded as follows:[13] "How often do you take a train or bus instead of a car or airplane for long journeys (defined as non-regular overnight journeys)?" The wording captured the extent to which respondents replaced high-carbon transport modes such as airplanes and cars with low-carbon transport alternatives. Answers were on a 5-point scale, from 0 for "never" to 4 for "always" engaging in the practice. A total of 30% of participants indicated never, 24% indicated between never and sometimes, 31% indicated sometimes, 11% indicated between sometimes and always, and 4% indicated always. At the time of the survey, 86% of the journeys implying an overnight stay involved equally road and air travel, with cars involved in 60% of the domestic trips, and air travel responsible for 83% of the international journeys.[14]

Independent variables were selected for their potential to illustrate elements of practice that could play a part in the decision to replace air and car travel with low-carbon alternatives. Following Kennedy et al. (2013), variables identifying the region of residence were used here as indicators of infrastructure. Access to air travel is relatively easy across the full extent of the country. However, many northerners and people living in western regions do not have easy access to the railway network, while those in the south and east of Norway enjoy satisfactory train and bus routes in addition to connections by sea and air to international and national destinations (Gulowsen and Ryggvik 2004; Lian 2010). Two dummy variables were used to capture travel norms at work and the Norwegian culture (being employed and being born in Norway, respectively), while the number of children was used as an indicator of the norms associated with journeying with younger travelers (Büchs 2016; Kennedy 2013).

The survey contained a short version of Kasser and Ryan's (1996) aspiration index, capturing extrinsic (financial success, image, and popularity) and intrinsic values (self-acceptance, physical health, community, and affiliation). Relative intrinsic goal orientation was calculated by subtracting average extrinsic scores from average intrinsic scores. An additional dummy variable identifying respondents who engaged in income comparisons accounted for materialistic values. Resource competencies and skills were addressed through six independent variables. Having a university degree and attending cultural events were used to indicate cultural capital,
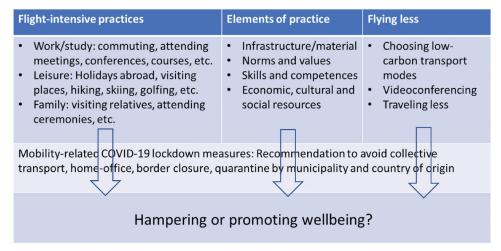
Figure 1. Empirical framework.

engagement in the local community was used to indicate social capital, and personal income approximated for economic capital (Kennedy 2013).[15]

Finally, to account for competencies and skills in the use of sustainable transport modes, a variable capturing the extent to which respondents engaged in low-carbon transport for short journeys was included in the regression. The question on sustainable short-distance travel was worded as follows: "How often do you walk, cycle, or take public transport instead of a car for short journeys (such as to and from work, shopping, or to regular leisure activities)?" Answers were presented on a 5-point scale, from 0 for "never" to 4 for "always" choosing low-carbon travel options.[16]

In-depth interviews on the journey from Oslo to bodø

I conducted twelve in-depth interviews between February and November 2020 with the exception of one pilot interview that was carried out in November 2019. Interviews were conducted in Norwegian, audio-recorded, and lasted from 60 to 90 minutes.[17] Due to the COVID-19 outbreak, all but three interviews were held online using Skype for Business, Teams, or Zoom, depending on each participant's preference. The goal of the interviews was to explore people's understanding of the three options for reducing air travel and to investigate how they were perceived in relation to well-being and need fulfillment. To make the study concrete, the focus was on the 1,064-kilometer (km) (661-mile) journey between Oslo and the northern city of Bodø. Bodø is the second largest Norwegian town north of the Arctic Circle, the fifteenth largest in Norway, and hosts the sixth largest airport in terms of capacity and the annual number of passengers. The 90-minute flight from Oslo to Bodø is the fifth most popular in the country with nearly 400,000 passengers taking the trip in 2020. Despite being the terminal station of the country's northern train line, not many travelers take the two daily trains covering the 18-hour trip to or from Oslo.[18]

I only interviewed respondents with experience traveling between Oslo and Bodø. As the goal was to explore people's understandings of reducing air travel, this study sought to include variation in age, gender, frequency and purpose of travel, and region of departure. The youngest participant was a 22-year-old student from Nord University in Bodø and the oldest was a 77-year-old retiree from the same city. Seven were women and five were men; some were or had been regular travelers, and others completed the journey once or twice a year for family or leisure purposes; and four resided in Oslo and eight in Bodø or the surrounding region. Four participants were recruited through Nord University in Bodø, three other respondents through the Norwegian Aviation Museum in Bodø, one person via a contact in the Norwegian Green Party, and the remaining four were recommended by personal contacts in Oslo.

I conducted the semi-structured interviews in two main parts. The first part consisted of questions addressing respondents' travel biographies in which modes of transport, destinations, and purposes were the focus (Greene and Rau 2018). The second part of the interview discussed the supporting elements that they needed to replace flights with train travel or videoconferences and how these elements connected with human-needs fulfillment and quality of life. Prior to the interview, we sent each participant by e-mail a copy of Max-Neef's list of nine fundamental human needs. The list was only used as a starting point for the discussion and respondents were free to relate to it or not when talking about well-being. The COVID-19 pandemic emerged as a cross-cutting theme, but it was also the topic of a specific question toward the end of the interview.

All interviews were transcribed verbatim except one where notes were taken due to technical problems with the audio recorder. I conducted a thematic analysis using the software program NVIVO 13. In the first phase, "concept" coding was used, based on the elements of practice addressed in this article and the research questions. In a second phase, I applied "emotions" and "descriptive" coding to capture emerging themes such as feelings of remoteness or travel-related comfort (Miles et al. 2020).

Results

Flying less pre-pandemic and elements of practice

Table 1 presents the results of a regression analysis exploring the elements determining the extent to which Norwegians replaced high- with low-carbon transport modes for long-distance journeys before the pandemic.[19] All models are estimated using ordinary least squares.[20] The first three models investigate the association between variables identifying infrastructure (Model 1); values and norms (Model 2); and resources, competencies, and skills (Model 3); and the frequency with which

Norwegians engaged in flying and driving less for long-distance journeys. Model 4 includes the three types of elements shaping practices as explanatory factors for sustainable long-distance travel. By including all the variables in the statistical analysis, we can be confident that any relationship that might be found between any of the factors identifying elements of practice, on one hand, and flying and driving less for long-distance journeys, on the other hand, is not due to the variables that are statistically controlled for. For example, by controlling for income in Model 4, it is not possible to assert that living in Oslo (compared to living in central Norway) is associated with flying and driving more for long-distance journeys because people in Oslo are on average richer.

Table 1 indicates that the variables approximating elements of practice are relevant for the study of reducing air travel in Norway. As presented earlier, the type of infrastructure available to respondents is approximated by dummy variables indicating a region of residence, with the well-connected south of Norway as the reference group. Compared to this region, residents in the north of Norway – most of them lacking access to the national railway network

Table 1. Long-distance low-carbon travel and elements of practice.

Variables/Model	1	2	3	4
Infrastructure (present and past)				
North	−0.296**			−0.282**
	(0.115)			(0.119)
Central	−0.062			−0.293***
	(0.107)			(0.108)
East	−0.014			−0.0741
	(0.0950)			(0.0968)
Oslo	0.189*			−0.246**
	(0.110)			(0.113)
West	−0.135			−0.273***
	(0.101)			(0.102)
Values and norms				
Relative intrinsic goal orientation		0.0384**		0.0327*
		(0.0188)		(0.0177)
Compares income		−0.149**		−0.121**
		(0.0584)		(0.0552)
Employed		−0.205***		−0.0487
		(0.0612)		(0.0592)
Born in Norway		−0.280***		−0.146
		(0.1072)		(0.101)
Children		−0.132***		−0.0620**
		(0.0307)		(0.0295)
Resources, competences, and skills				
University degree			0.127**	0.120**
			(0.0510)	(0.0578)
Personal income			−6.98e−06***	−6.14e−06***
			(1.29e−06)	(1.49e−06)
Cultural activities			0.154***	0.170***
			(0.0309)	(0.0332)
Local engagement			0.048**	0.0267
			(0.0213)	(0.0224)
Sustainable travel (short)			0.307***	0.301***
			(0.0166)	(0.0209)
Constant	1.157***	1.624***	0.162	0.555**
	(0.162)	(0.201)	(0.141)	(0.220)
Observations	2,014	1,719	2,014	1,719
R-squared	0.026	0.044	0.1875	0.204

Note: The control variables age, gender, and health status are used in the four models but not included in the table. South is the reference group for region. Robust standard errors are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

– appear to engage in the air- and car-travel reduction to a lesser extent than their southern counterparts (Models 1 and 4). This is also the case for respondents living in other regions, including Oslo, when all the other elements of practice are controlled for (Model 4). The exception is southeastern Norway, probably because this is a region with satisfactory road and train connections to Oslo and mainland Europe through Sweden. The following quotation by a respondent from the sparsely populated Lofoten archipelago in northern Norway illustrates the role of infrastructure.

> The challenge is that the train only goes to Bodø, so I had to start to take the boat from Bodø … I cannot remember that it was a topic really … and remember that taking the plane is one hour, 15 minutes Oslo to Bodø and 20 minutes from Bodø to Lofoten, so in two hours … and when the airport was in Fornebu it was a short moment out to the airport, two hours on the plane and then I was at home.

Concerning values and norms, Table 1 illustrates that both a relatively intrinsic value orientation and a disregard for income comparisons are associated with engaging in sustainable mobility. This association is maintained in Model 4, when all other elements of practice are controlled for. Two indicators were used to approximate written and non-written norms at the workplace and in Norway in general, where vacationing in the south of Europe is a largely accepted practice. The results of Model 2 indicate that being born in Norway and having a job are both negatively associated with reducing air and car travel, but that this relationship does not hold when the other elements of practice are controlled for in Model 4.[21]

The number of children in the household was included to approximate norms of convenience and efficiency that justify avoiding sustainable transport alternatives. This might be relevant to a reduction in air travel, as the larger the number of children in the household, the less frequently the parents replace a flight or car with a train or bus trip. The following excerpt illustrates the challenges faced by families with children when engaging in long-distance travel to visit relatives:

> I personally have nothing against trains. I love trains and buses and such. But when you have kids that get impatient quickly, there has to be a good offer for them … If I am going to Bodø [to visit my parents] it is a long train ride, then you have one night and one day and a few hours more until you arrive. That is pretty long to entertain kids.

Resources, competencies, and skills explain 18% of the variation in long-distance sustainable mobility (Model 3). Concerning cultural capital, the variables capturing respondents' consumption of cultural

events and having a university degree are positively associated with flying less. As expected from the fact that frequent flyers are often wealthier (Hopkinson and Cairns 2020), having a higher monthly income, a variable used to approximate economic capital, is negatively linked to choosing low-carbon alternatives to flying. Social capital, studied here through a variable indicating the frequency with which people engage in their local community, is not a significant determinant of air-travel reduction when infrastructure, values, and norms are included in Model 4. Using sustainable transport modes for short-distance travel is a significant determinant of low-carbon travel in long journeys. Conversely, the more that people drive their cars for short-distance journeys, the less they replace flights or cars with train and bus trips, and this happens independently of the region of residence and income level, as these factors are controlled for in the analysis.

Flying less and well-being during COVID-19 pandemic

On March 12, 2020, the Norwegian government announced restrictive travel measures discouraging international and domestic travel. There is no indication that the change of norms associated with these actions did anything to promote low-carbon alternatives to flights, as recommendations to avoid collective transport were issued nationwide (Ursin et al. 2020). During the first months of the pandemic, many people learned to use videoconferencing tools for meetings, courses, conferences, and as a replacement for family visits and leisure activities. How the reduction in air travel as a consequence of the COVID-19 travel restrictions influenced the well-being of travelers is analyzed in the following sections, drawing on data from in-depth interviews with travelers who journey between Oslo and the Arctic city of Bodø.

Replacing flights with train trips
To discuss the potential effect of norms supporting the substitution of flights with low-carbon alternatives, we discussed hypothetical situations such as employers refunding only train tickets or plane tickets for the trip from Oslo to Bodø and the journey becoming unaffordable due to high aviation taxes. In general, participants agreed that increased economic, normative, or regulatory barriers to air travel would demand organizational changes concerning economic and time-related compensation to workers, greater institutional and social acceptance of slow travel, and intensive use of videoconferencing. This was not necessarily seen as negatively affecting

their well-being. As a former commuter between Oslo and Bodø put it,

> I sort of think it is two things then. On one hand, a train would have taken a longer time, and on the other side, you could have traveled less if you had video. So, the question is the sum of those … It could be that we could have organized things in a way so we could travel every second week, for example, so that we could, sort of … at least in periods. And then I would think that it would have kind of evened out then.

Being able to choose trains over flights for work purposes was considered to have a positive effect on the fulfillment of the needs for participation and freedom.

> Participation, at least as things are now, I think that such a type of environmentally friendly … to be able to travel more environmentally friendly would have been positive, in a way, the feeling of contributing to the society at large … yes. So that could have been positively impacted.

> Then you have this about guidelines about working hours, et cetera, that it is important that you are free to choose the train. Also, if it is more expensive, for example, it is a type of freedom, that is clear.

Most participants traveling between Oslo and Bodø for family reasons did not make the journey during the first three months of the pandemic. Some of them did not visit their elderly relatives or grown children for more than six months at the time of the interview. The majority of those traveling for family reasons did not contemplate taking the train instead of flying during or after the COVID-19 pandemic. Several factors influenced this outcome. First, participants are accustomed to visiting their families in Bodø or Oslo for two to three days, and the train trip takes more than 17 hours, including a transfer in Trondheim. Second, flights are traditionally half the price of trains between Oslo and Bodø, as the latter trip includes an expensive sleeper car. Nonetheless, it seems that greater social resources in terms of a positive predisposition to training travel by family and friends could have increased participants' use of trains. As a retired frequent flier explained,

> So, if somebody could convince me about the fact that I could relax completely on the train, it would have been pretty fun to have taken the train from Bodø to Oslo and compare with, for instance, when I was 7 or 8 years old, (to) see what happens now, does the same thing happen, are the places the same, what has changed. But I am not really in that place yet. I think if I could choose, I would take a plane.

When restrictions were eased in June 2020, tickets for the train trip between Oslo and Bodø quickly sold out. A respondent from the tourist industry claimed that this had never happened before, and the high demand suggests that during the summer of 2020 Norwegians might have increased their competence (meaning skills and knowledge) needed to incorporate train travel as part of practices such as visiting relatives or going on vacations in their own country.

Videoconferencing

In Norway, the consolidation *of videoconferencing* as an integral part of practices concerning work, leisure, and family was spurred by the stay-at-home recommendation of the authorities and the closure of all shopping centers, restaurants, leisure activities, and sports facilities in the country. These sudden changes triggered an increased demand for videoconferencing programs and associated hardware, rapid acquisition of associated skills and competencies, the emergence of digital support networks, and, after a while, routinization of the practice. Interestingly, the two interviewees involved in local politics highlighted how it would have been socially unacceptable to engage in virtual meetings with high-level politicians before the lockdown, but the change of norms concerning COVID-19 made it seem reasonable.

> I also know that meetings between municipality and national authorities now have been done digitally. Before, it would have been unreasonable, almost a little lack of respect, to suggest such meetings to be digital. Physical attendance has been seen as natural. In this period, it has been different.

People were recruited into videoconferencing, which increasingly became a part of practices such as attending meetings, workshops, and conferences. The respondents said they would be happy for videoconferencing to become institutionalized in the post-pandemic period. As one participant said,

> But now, in the corona crisis, they have been forced to sit over Skype or over Teams and such. They are forced to do things in a different manner. And I think that is great, I support it, and if I could participate in a videoconference instead of beginning to travel and move around, I would have.

The development of videoconferencing skills at work gradually permeated other domains of everyday life. People have even used online-videoconferencing tools to play games with family members and to participate in celebrations. Nevertheless, and notwithstanding the skills acquired using videoconferencing platforms, people agreed that social interactions and informal communication benefit from physical meetings. As one participant stated,

> We talk with the family on FaceTime or Skype and such, but it is not the same. No. Because it is not

only seeing them and talking with them, it is sort of doing … creating experiences together."

Despite the fact that videoconferencing was not considered a satisfactory replacement for physical encounters, it was believed to contribute to need fulfillment, particularly concerning the needs for participation, freedom, and creation. The positive effects on well-being were especially noticeable when the use of online platforms resulted in less work-related travel.

Traveling less

After experiencing the first weeks of COVID-19 lockdown, many participants conceded that most previous work-related trips were unnecessary and were not justified by the urgency or importance of their purpose. A participant went so far as to appraise more than one-third of his previous business trips as superfluous.

> Now that we have got this experience that we have got in this home office/corona time, I can actually imagine that many more meetings can be replaced, now that we are used to using Teams and Skype and Zoom and such things. Yes, so I actually believe that out of the eight trips I have taken this year, three can be replaced with video conferences.

They also considered that traveling less had offered the possibility of fulfilling their needs for participation, creation, leisure, and affection. There was a positive feeling associated with the opportunity to slow down and focus on the "here and now." As one respondent described it,

> Partly because I have traveled less … the days have, in total, gone a bit slower in a way, so they have contributed to the focus moving from the brain to the heart, to put it that way, and more focus on what is here and now and what is close, and the relationships that are close to me. And it varies across individuals, clearly. And for my part I think that I maybe can say that I have got a higher quality of life because of this. Really.

It is unclear whether traveling less for leisure and family will become a trend in the post-COVID period because this issue was not widely discussed in the interviews. People did not see their vacations as something they could do without traveling, although sustainable transport modes such as trains were not rejected if comfort, amenities, and speed were improved. Upon reflection, participants who were accustomed to flying for a one-day visit or a weekend with friends no longer viewed that practice as personally or environmentally sustainable, saying they might be willing to reduce these types of trips in the future.

Finally, it is important to emphasize here that, in general, quality of life did not increase during the COVID-19 pandemic. Some of the negative factors mentioned by participants related to having to juggle children and a home office, being unable to see family and friends, having to face possible job layoffs and fears about redundancies at work, and feeling lonely and isolated. All of these factors reportedly diminished the well-being of respondents, and some of them were clearly related to practices concerning family visits and celebrations. As an Oslo resident said,

> And then people got very afraid of meeting each other, especially in the beginning. Such as "yes, yes, we'll see each other when this is over and it is allowed again" and similar, even if you in reality could sit two meters from each other and talk outside. It was not forbidden. But people did not dare. I feel I got very, very lonely.

Discussion and conclusion

This study has used a mixed-methods approach to explore the elements of social practice that are associated with a reduction in air travel. It has focused on the implications for the well-being of the changes in flight-intensive practices as a consequence of the Norwegian government's attempt to limit the spread of the COVID-19 virus. As highlighted in the quantitative study, residents of relatively remote regions who lack viable train and bus alternatives are more likely to choose flights or cars over train travel than residents in the better-connected south of Norway (Lian and Denstadli 2004; Mattioli et al. 2021). This is also the case for people who engage relatively more intensively in social comparison, those with children, and those who are wealthier (Hopkinson and Cairns 2020; Sahakian et al. 2021). Conversely, emphasizing intrinsic values, having higher social capital, and engaging in short-distance, sustainable travel are positively associated with flying and driving less (Büchs 2016; Jacobson et al. 2020). People who are recruited to cycle, walk, or take collective transport for short-distance travel might have developed habits, competencies, and skills – and, perhaps, social resources, too – supporting a lower flight intensity.

Travel restrictions in force since March 2020 resulted in a dramatic decline in domestic and international air travel. As stay-at-home messages and travel constraints applied to all transport modes, most practices became disconnected from traveling. Respondents discussed in the interviews flight-intensive practices linked to family visits and, to a lesser extent, leisure. Videoconferencing was used widely during the lockdown period as a way of communicating with family and friends and engaging in celebrations and other leisure activities. Nevertheless, there was a general understanding that physical

contact and seeing family and friends in person could not be replaced by digital communication alone and that traveling less for this purpose in the future was not among participants' plans. They said they would be willing to consider low-carbon alternatives to flying before giving up family visits or vacations but, as emerged in the quantitative study, this might be challenging for families with young children. Interviews did not discuss how videoconferencing platforms had been employed to exercise or learn new skills, for example. Nevertheless, they captured the loneliness felt by some respondents when they were unable to meet friends and relatives in person, which is a major reason for flying.

Concerning work-related practices, some interview participants went so far as to reassess more than one-third of the flights taken to participate in meetings, lectures, workshops, and conferences before the pandemic as unnecessary. Those people who evaluated part of their air travel as unnecessary is not an uncommon finding in the literature. For example, Gössling et al. (2019) found that in retrospect international students in Sweden considered 42% of their flights as of little importance. However, for reductions in air travel to materialize, other elements of practice or *synergic satisfiers* must be in place. The quantitative study suggested the importance of proximity to railway infrastructures, intrinsic values and family-related norms, and relevance of socioeconomic and cultural resources and competencies. Interview data supported the importance of these factors and added the need to change the norms of companies. Participants reported that employers should prioritize low-carbon transport by compensating employees who choose time-intensive trains overflights with extra vacation days, time off, or even more flexible work arrangements. A change of norms in the workplace also meant that employers should be more willing to formalize the use of videoconferencing.

In general, reducing air travel for work-associated reasons was linked to higher levels of well-being and need satisfaction. In the context of employment-related practices *flying less* became a *synergic satisfier* as it contributed to fulfill the needs for identity, freedom, leisure, and creation. During the COVID-19 pandemic, a reduction in air travel was promoted through travel restrictions at the national, regional, and corporate levels. This change in regulations had a significant influence on Norwegians' air-travel behavior, even if economic incentives such as the temporary lifting of air-passenger and airport charges worked against it. Nationwide travel restrictions cannot be considered a synergic satisfier due to their likely negative effect on needs linked to family and social relations, but corporate norms and work ethics based on limited business travel could be regarded in such terms.[22] The positive impact of flying less on well-being and participants' recognition that more than 30% of work-related flights were unnecessary suggest that more than 10% of total domestic flights could be readily avoided in post-pandemic Norway.[23]

This analysis imparts two additional lessons. The first concerns the fact that many people who report walking, cycling, or taking collective transport in the city choose trains or buses over flights or cars when engaging in long-distance travel. Improving the availability of local buses, bikes, or electric car rentals at train and bus stations could reinforce this behavior. The Norwegian transport plan introduced by the government in 2021 discusses a "universal design in the transport sector," but does not yet contemplate increased connections between short- and long-distance sustainable transport modes.[24]

The second lesson is related to the popular acceptance of "discourses of climate delay" based on the general belief that Norwegians are unwilling to accept restrictions on flying due to the geographic distribution of the country's population and the limited rail network.[25] Currently, most domestic air travel occurs on the routes from Oslo to Bergen, Trondheim, and Stavanger and these three cities are also connected to Oslo by train. This study supports the argument that reducing air travel by replacing flights with trains or buses, engaging in videoconferencing or traveling less will enhance the well-being of people traveling for work. The results reported here also find that an increase of workers' well-being from flying less requires that other interdependent synergic satisfiers such as flexible work arrangements or corporate travel guidelines prioritizing low-carbon travel options are present. Future research should investigate the additional local and, even sector-specific, *satisfiers* that are required to consolidate a reduction in work-related air travel.

This exploratory article has several methodological limitations. First, social desirability bias, reporting high engagement in sustainable practices due to their increased acceptability in society, might have influenced the results. Although the survey and the interview guide were designed to minimize this type of distortion, it is not possible to rule it out completely. Second, the quantitative part of the analysis draws on a survey that was not designed to study social practices and a reduction in air travel. This implies that the regression model used here could be misspecified, as important elements of practice linked to infrastructure, norms and skills, resources, and competencies might not have been included. This could have resulted in biased parameter estimates. A survey focusing on the flight-

intensive practices associated with work, family, and leisure travel would be better suited for a practice-based study. Finally, I conducted in-depth interviews around three strategies for reducing air travel – replacing flights with train trips, videoconferencing, and traveling less – instead of focusing on, for example, commuting, visiting family, or taking an annual vacation abroad. It is likely that a specific focus on practice would have enriched the findings and improved understanding of the elements that play a key role in determining post-pandemic reductions in air travel.

Notes

1. See, for example, an article in the online newspaper *Nettavisen*, in which a representative of the Norwegian Green Party argues against asking people not to fly, instead suggesting new reliance on electric airplanes and the purchase of CO_2 quotas as a way to reduce the climate impact of flights (https://www.nettavisen.no/na24/per-espen-stoknes-mdg-du-far-aldri-nordmenn-til-a-slutte-a-fly/s/12-95-3423394258) (in Norwegian).
2. Total emissions in Norway from transport declined by approximately 7% between 2019 and 2020.
3. See https://www.ssb.no/transport-og-reiseliv/artikler-og-publikasjoner/nesten-40-prosent-faerre-kollektivreiser-i-2020 (in Norwegian).
4. Kallbekken and Saelen (2021) found that 70% of Norwegians supported flying less for leisure purposes to limit the spread of COVID-19.
5. Kennedy et al. (2013) draw on Spaargaren (2003) and Southerton et al. (2004) to suggest that when studying sustainable transport practices, it is useful to focus on the resources, norms, and infrastructures shaping practices. The concept of resources links to the work of Bourdieu (1990) considering that economic, social, and cultural capital constrain the choices available to people.
6. Max-Neef (1991) defined satisfiers by their success in meeting needs. *Synergic* and *singular* satisfiers positively contribute to need fulfillment, with the former having a positive effect on more than one need and the latter satisfying only one. *Inhibitors* (oversatisfy one need and are detrimental for at least one other need), *destroyers* (impede the satisfaction of what they aim to achieve), and *pseudo-satisfiers* (appear to fulfill a need in the short run but fail to do so in the long run) had a negative impact on need fulfillment.
7. See data from Eurostat at https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Air_passenger_transport_-_monthly_statistics.
8. See https://www.statista.com/statistics/1111779/coronavirus-death-rate-europe-by-country/.
9. See https://www.regjeringen.no/no/aktuelt/regjeringens-strakstiltak-for-a-dempe-de-okonomiske-virkningene-av-koronaviruset/id2693442/ (in Norwegian).
10. Data on the impact of the coronavirus pandemic on transportation is available at Statistics Norway (https://www.ssb.no/helse/faktaside/konsekvenser-av-korona#blokk-3) (in Norwegian).
11. A total of 120 persons, most of them over 65 years of age, were interviewed by telephone.
12. The survey was part of the Happy-ICT project at the University of Oslo funded by the Research Council of Norway (ID: 247921), SAMANSVAR program.
13. Author's own translation from Norwegian.
14. See https://www.ssb.no/statbank/table/06921/tableViewLayout1/.
15. The question approximating attendance to cultural events was a generic question asking participants to indicate the frequency of buying tickets online to attend events.
16. Concerning short-distance travel, 17% participants answered never, 14% answered between never and sometimes, 27% answered sometimes, 21% answered between sometimes and always, and 21% answered always.
17. The qualitative phase of the study obtained formal approval from the Norwegian Centre for Research Data (NSD), an independent ethics committee in Norway. The project reference number is 424381.
18. Data on the number of passengers and travel models can be found at https://www.ssb.no/en/transport-og-reiseliv/reiseliv/statistikk/reiseundersokelsen. There is no direct train between Oslo and Bodø. Passengers must change trains in Trondheim, a city 594 km (369 miles) from Oslo and 705 km (438 miles) from Bodø. In 2020, 261,237 passengers took the train between Trondheim and Bodø and vice versa. A comparison between travel models concerning CO_2 emissions in Norway is available at the website of the organization *Framtiden i våre hender* (*The Future is in Our Hands*) (https://www.framtiden.no/gronne-tips/reise-og-transport/klimagassutslippet-fra-ulike-reisemater.html). Travelers from Oslo to Bodø transfer to a diesel train from Trondheim. Diesel trains emit 91 grams of CO_2 per km, almost four times more than electric trains, as electricity in Norway is generated by hydropower. Still, following *Framtiden i våre hender*, the emissions from a domestic flight are more than double those of diesel trains, on average.
19. As this is a cross-sectional study, causal explanations cannot be made. Thus, results are presented in terms of correlation of association.
20. Due to the ordinal nature of the dependent variable, estimates were also made using an ordered probit model. Coefficients and significance of the main independent variables did not vary significantly across models (results not shown).
21. The dependent variable defined long-distance travel as spending a night away from home. This is not always the case for job-related journeys, as it is common for Norwegians to fly from Oslo to Bergen, Trondheim, or Stavanger, for example, for a one-day meeting.
22. As I write this, Oslo Metropolitan University has announced a new travel policy where priority is given to sustainable alternatives to air travel for most trips in Norway and throughout the Nordic countries (except to the northern regions).
23. This rough calculation is based on SSB data indicating that 42% of domestic flights in Norway are work-related. The study further suggests that 30% of these trips might be considered superfluous after the pandemic. Aamaas and Peters (2017) calculated that a 10% reduction in air trips would

reduce total climate impact from domestic sources by 5.2%.
24. The National Transport Plan 2022–2033 (in Norwegian) is available at https://www.regjeringen.no/contentassets/fab417af0b8e4b5694591450f7dc6969/no/pdfs/stm202020210020000dddpdfs.pdf.
25. Lamb et al. (2020) define discourses of climate delay as those arguments justifying inaction or inadequate efforts to reduce greenhouse gases by, for example, emphasising the costs of mitigation and stressing the impossibility of halting climate change.

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