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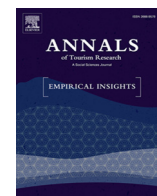
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Visual protest discourses on aviation and climate change

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ABSTRACT

Various solutions have been suggested for the large climate impact of aviation, some of which would have far-reaching consequences for tourism. This study analyzes the discourses of climate protesters on this topic. Visual protest materials targeting aviation were photographed at three Swiss climate demonstrations in 2019 and analyzed using the Sociology of Knowledge Approach to Discourse. The protesters criticize air travel for its climate impact, assign responsibility to the travelling public, and promote solutions involving reduced air travel demand. They omit offsetting and technological solutions, thereby diverging from the discourses of the Swiss media and the aviation industry. The tourism industry should prepare for possible changes in travel patterns which might occur if this movement succeeds in promoting its views.

1. Introduction

Aviation is an important part of the tourism sector, accounting for 96% of touristic arrivals between regions and the largest share of intra-regional international touristic arrivals out of all transport modes outside Europe (World Tourism Organization and International Transport Forum, 2019). As such, aviation contributes significantly to the 10.3% of the global gross domestic product accounted for by tourism (World Travel & Tourism Council, 2020).

Aviation also has a large environmental footprint (IPCC, 1999). In 2005, it was responsible for 40% of the tourism sector's CO₂ emissions (World Tourism Organization and United Nations Environment Programme, 2008). In terms of actual impact on the global climate, its share is even larger due to the emission of non-CO₂ greenhouse gases, and because CO₂ has a larger warming effect when emitted at high altitudes (Lee et al., 2009). Since early 2018, aviation has received increased criticism in the media and public discourse for its environmental footprint (Friedrich et al., 2020; Wolrath Söderberg & Wormbs, 2019), which in 2019 prompted the Director General and CEO of the International Air Transport Association (IATA) to state that the 'rise of anti-aviation sentiment over these last months' and environmental sustainability were 'the greatest challenge' to the aviation industry (IATA, 2019). Unsurprisingly given the proximity of aviation and tourism, this anti-aviation discourse frequently touches on tourism (Wolrath Söderberg & Wormbs, 2019).

Various solutions have been proposed to address the unsustainability of aviation. The aviation industry suggests technological solutions, such as alternative fuels or improved aircraft engines or frames (Gössling & Peeters, 2007; Peeters, Higham, Kutzner, Cohen, & Gössling, 2016), as well as carbon offsetting (IATA, 2018). A different approach promotes a change of travel patterns in which consumers travel less or not at all by air, using other modes of transportation, traveling to less distant destinations, staying longer at the destination, or traveling less in general. This could be achieved through voluntary behavior change on the part of consumers (Flight Free World, 2021) or through a wider range of policies and activism: opposition to infrastructure projects; bans on lobbying, advertising, and state funding for aviation; divestment; regulations at the institutional, national, and international level; taxation schemes; and support for alternative modes of transportation (Haßler et al., 2019). Either way, such a profound change in travel patterns would drastically affect the tourism sector, with some destinations, organizations, and modes of tourism experiencing losses while others might benefit.

Research has repeatedly shown that travelers are unaware of the climate impact of aviation (Becken, 2007; Lassen, 2010), or reluctant to limit their air travel despite environmental awareness (Hanna & Adams, 2017; Kroesen, 2013; McDonald, Oates, Thyne, Timmis, & Carlile, 2015), but this may be changing in the light of the recent debate. For example, in a German study conducted in August 2019, 41% of all respondents said they were willing to reduce their holiday flights by 20% (Gössling, Humpe, & Bausch, 2020). In another study

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conducted in September and October 2019, 12% of respondents across the EU, 10% in the USA and 14% in China said they planned to fly less in the future to fight climate change – in addition to those who claimed they already did so (European Investment Bank, 2020). The annual statistic indeed showed a global slowdown in passenger growth for 2019 (IATA, 2020). For the case of Germany, one study concludes that the ‘flight shame’ movement contributed to this (Friedrich et al., 2020), but the massive decline in air travel following travel restrictions in the course of the COVID-19 pandemic in 2020 (Chen, Demir, García-Gómez, & Zaremba, 2021) quickly eclipsed all other trends in the data, making this theory difficult to verify. This obscuration is likely to continue until 2022 (Gudmundsson, Cattaneo, & Redondi, 2021).

It therefore remains speculative whether popular environmental concern will reduce air travel demand in the future, but the tourism sector should watch this development carefully. Given that decarbonization is in any case an important task facing the tourism sector (World Tourism Organization and International Transport Forum, 2019), such a potential change doesn’t have to be only an adversity for tourism, but might present a useful catalyst for a transformation toward sustainable tourism. This study offers a look into where the contemporary climate movement stands on the issue of aviation and climate change, which can help tourism professionals and scholars anticipate not only the challenges raised by the environmentalists, but also possible synergies with that group.

The global wave of large street protests in 2019 – prominently spearheaded by two sub-movements that had begun in 2018, *Fridays for Future* (FFF) and *Extinction Rebellion* – provided a suitable window into the views of the climate movement. Not only were the protests a particularly salient manifestation of the movement during the studied period, they also allowed direct access to the views held by individual movement participants, rather than the agendas of movement organizations. Taking advantage of this unique opportunity, in this paper I analyze visual protest materials – such as placards or banners – displayed by protesters at large street demonstrations organized by the Swiss branch of FFF in 2019. Applying the Sociology of Knowledge Approach to Discourse (Keller, 2011) to these materials, I aim to answer the following initial research question:

RQ1. *What views on aviation and climate change do the protesters express?*

This can be parsed into three sub-questions:

RQ1a. *How, if at all, do the protesters problematize aviation?*

RQ1b. *Whom do they hold responsible for causing and for solving this problem?*

RQ1c. *Which solutions do they promote?*

During the research process, it became clear that solutions suggested by the protesters didn’t include technological fixes and carbon offsetting. Given that the Swiss public discourse on aviation and climate change prominently includes these solution types, and the protesters are therefore likely to know about them, this finding indicated that they were deliberately omitting these solution types. Thus I conducted a content analysis of Swiss mainstream media articles discussing aviation and climate change, and compared the solutions discussed therein to the solutions promoted in the protest discourse, in order to answer the following additional research question:

RQ2. *Do the solutions suggested by the protesters diverge from those presented by Swiss mainstream media?*

2. The visual discourse of SWISS Klimastreik/Fridays for Future protesters on aviation

The above research questions are investigated in Switzerland, which is well suited for this purpose because the country’s high average of 1.6 annual airborne trips per person (INTRAPLAN Consult

GmbH, 2018) make the climate impact of aviation a likely topic to occur in public discourse. Furthermore, the prominent international discourses described above are being reproduced by actors on the Swiss national scale, which provides some basis for extrapolation from Swiss discourses back to international ones: The national flag carrier Swiss International Air Lines promotes technological solutions and carbon offsetting, alongside efficient organization (SWISS, nd). The campaign Flugstreik collected pledges from individuals not to fly in 2020, while also suggesting political measures such as removing subsidies for aviation and opposing infrastructure projects (Terran, 2021).

When the present study was conducted in 2019, the global, youth-run social movement organization *Fridays for Future* (FFF) was a particularly visible manifestation of the climate movement, both in Switzerland (by the name *Klimastreik*) and in many other countries. It developed out of a school strike begun by the then 15-year-old Swedish activist Greta Thunberg on August 20th, 2018 (Fisher & Nasrin, 2020). After three weeks of daily striking in front of the parliament, Thunberg limited her strikes to Fridays, and groups of pupils and students across Sweden and in other countries began to join in (Wetzel, 2019). Demonstrations took place worldwide, often in front of government buildings, and often in the form of strikes (Moor, Uba, Wahlström, Wennerhag, & De Vydt, 2020). The COVID-19 pandemic in 2020 has made this form of protest difficult, but the movement has moved much protest action online (Fisher & Nasrin, 2020) and organized a global strike on September 25th 2020.

FFF’s core demand is that states fulfill their commitments to the 2015 Paris Agreement to limit global warming to 2 degrees Celsius (better 1.5 degrees) above pre-industrial levels (Sommer, Rucht, Haunss, & Zajak, 2019). FFF demonstrators are well-educated, with females often outnumbering males, although gender is balanced in Switzerland (Moor et al., 2020). The level of support for Klimastreik/FFF in Switzerland has not been quantified, but in the neighboring country Germany, more than half of the population supported the strikes at the time the present study was conducted (Koos & Naumann, 2019). However, both Thunberg and the other protesters have also aroused distrust, dismissal, and derogation, as has been analyzed specifically with regard to Thunberg’s highly publicized refusal to travel by air (Mkono, Hughes, & Echentille, 2020).

Klimastreik/FFF provided a suitable context for this study because it received considerable media attention in 2019, thereby potentially influencing the general public (Smidt, 2011). However, rather than investigating a particular sub-movement, the focus of this study is on undercurrents within the wider contemporary climate movement, at least in Switzerland. Indeed, the three demonstrations where the data for this study were gathered attracted participants from beyond Klimastreik/FFF’s core demographic of schoolchildren. All three occurred in the context of internationally coordinated protest days, and were preceded by mobilization efforts targeting the general public. A survey conducted by another research team at one of the demonstrations I studied reveals that the event mobilized people of all age groups, with youth participants comprising only 25% (Moor et al., 2020). 52% of adults and 36% of students in the survey actively or financially support other environmental organizations, illustrating their affiliation with the wider climate movement rather than Klimastreik/FFF specifically.

Political protest can impact society in many ways, potentially affecting elections, retirement of representatives, and voting behavior of representatives (Madestam, Shoag, Veuger, & Yanagizawa-Drott, 2013), public opinion (Banaszak & Ondercin, 2016), and attention paid to an issue by policymakers (King, Bentele, & Soule, 2007). Although the precise role of visual protest in this process is unknown, it can be assumed that these materials express the same ideas which also inform other movement activities, and can therefore be interpreted as indicators for the main thrust of the movement. Therefore, while the focus of this study is on characterizing the discourse put forth by protesters rather than on the effects this may have on society, I speculate on potential effects in the Conclusions section.

2.1. Visual protest materials at political demonstrations

Visual protest materials displayed at demonstrations were chosen as the primary data source for this study because they were very salient at Swiss Klimastreik/FFF demonstrations – as well as in the corresponding media coverage – and allow insights into the ordinary protesters' discourse rather than the more centralized communications of the organization Klimastreik/FFF.

I borrow the term *visual protest material* from Philipps (2012) and define it as any object displayed by protesters in order to communicate at a protest event. This includes 'signs, posters, banners, flyers, stencils, graffiti, stickers, cartoons, comics, scrolls, road signs, petitions, photographs, postcards, personal messages, post-it notes, prayers, artworks (including sculptures and installations, children's art, chalk drawings, etc.), t-shirts, board games, newspaper pages, maps, flags, toys (e.g. toy umbrellas), jewelry [and] balloons' (Lou & Jaworski, 2016, p. 6). Particularly common at FFF demonstrations are placards, which are usually made of cardboard and held in the air, often attached to a stick (Demarmels, 2016), though they can also be attached to objects or stand freely (Lou & Jaworski, 2016). Beyond being carried around physically, visual protest materials can be mobile in a wider sense through reproduction and recontextualization, for example by being photographed and uploaded to online spaces (Chun, 2014) and then 'downloaded' for use at a different offline site (Lou & Jaworski, 2016). Reproduction in the media would be another example of such mobility.

Visual protest materials are a mode of communication that can employ verbal and visual elements in a way similar to advertisements or political posters (Demarmels, 2016), and have been identified as 'a form of Discourse' (Kasanga, 2014, p. 23). They may address a global audience, for example through international media (Kasanga, 2014; Martín Rojo, 2014), as well as local audiences or governments (Barni & Bagna, 2016; Kasanga, 2014). Their discursive functions include making demands, expressing feelings, and contesting the legitimacy of authorities (Kasanga, 2014); communicating definitions of a problem as well as possible solutions (Daphi, Lê, & Ullrich, 2013); presenting group identity (Seals, 2013); informing, and persuading (Demarmels, 2016). They can also organize space, for example by regulating conduct or marking a space as belonging to a social movement (Lou & Jaworski, 2016), blocking out undesired aspects of a space such as advertisement (Martín Rojo, 2014), or even constructing a 'parallel city' (Lou & Jaworski, 2016; Martín Rojo, 2014).

In a Russian study (Aleksievsky, 2012), young working people with high education levels were the most likely to carry placards, and most people with placards had never made one before. The vast majority of placard-bearers had made their placards themselves, and no earlier than the evening before. The ideas for the placards had come mostly from themselves but also from media, the internet, or friends.

Visual protest materials can yield insights into the social movements that display them. Philipps (2012) demonstrates the fruitfulness of analyzing visual protest materials by showing that their characteristics (mostly spatial and stylistic aspects of text design) can differ between groups of demonstrators with different demographic characteristics and agendas. Daphi et al. (2013) show the same for image elements and image composition and go on to claim that visual protest materials imply aspects of worldviews. In a similar spirit, Begum (2015) studies the ideology reflected in a Pakistani sample of visual protest materials, and Said and Kasanga (2016) apply frame analysis to a sample from the Arab Spring. This body of work shows that central ideas of social movements can be inferred from analyses of materials displayed at their demonstrations.

Visual protest materials in the context of FFF have been studied only in one Swedish master thesis (Meier, 2019). Meier analyzes photographs of the materials uploaded to official social media accounts of German FFF groups, and identifies three frames in which the materials discuss climate change: A) as a collection of individual issue fields (causes and solutions of climate change), B) as the failure of adults and intergenerational justice, and C) as transnational in scope and in responsibility. Transport is one of the three most prominent issues within Frame A (11 out of 68 materials

within this frame, out of a total 432 materials analyzed), but Meier reports only one slogan related to aviation. Therefore no expectations for the present study could be drawn from Meier (2019).

2.2. Study methods

Research questions 1a, 1b, and 1c were investigated based on 93 visual protest materials that were displayed at Swiss climate demonstrations in 2019. These materials were analyzed using the Sociology of Knowledge Approach to Discourse (Keller, 2011). Based on the results to research question 1c, the additional research question 2 was defined, and was investigated using 31 media pieces from Swiss mainstream media discussing aviation and climate change.

2.2.1. Collection of visual protest materials (RQ1)

I collected 93 photographs of aviation-related visual protest materials displayed by protesters at three large (10,000+ attendees according to the organizers) demonstrations organized by Klimastreik/FFF in Switzerland in 2019. Two demonstrations, on May 24th and September 27th, took place in Zurich and were advertised regionally throughout the canton Zurich, while other Swiss cantons hosted their own events. The last demonstration, on September 28th, took place in Bern, the de facto capital of Switzerland, and was advertised as a national event. Combined with the fact that the Zurich demonstrations were held on Fridays while the Bern demonstration was held on a Saturday, this explains the far larger turnout of 75,000 to 100,000 protesters reported in Bern (Moor et al., 2020) compared to 10,000 at each Zurich demonstration (according to the organizers). Both cities have airports, making aviation an equally likely topic for discussion.

Each demonstration consisted of a march followed by a closing rally. Following Philipps (2012), I positioned myself at the head of the march before it began to move, and then systematically photographed all aviation-related visual protest materials I could find while the crowd marched past me, thus minimizing the likelihood of missing relevant materials. My focus was on placards and banners, which are most visible at a distance, but I also photographed other materials when I encountered them. At one demonstration (September 27th), an assistant took the photographs as described above. I extended his dataset on the same day by adding 10 photographs from a temporary public online archive, which had been set up by Klimastreik/FFF Zürich for protesters to share their photographs of the event as press material. Where known, the photographers are credited in the acknowledgements of this article. All photographs displayed in this article were taken by me or my assistant.

As I cannot speak French, Italian, or Romansh, all official Swiss language, I didn't look for materials in those languages. The French signs were identified based on their visual or non-French content. Therefore there may have been more materials about aviation in these languages which I did not recognize, but since all studied demonstrations were located in German-speaking Switzerland, a large share of materials in these languages was not expected.

2.2.2. Analysis of visual protest materials (RQ1)

No standard methodology has yet emerged for analyzing visual protest materials. Several approaches have been suggested that draw on such varied traditions as art history (Daphi et al., 2013), discourse analysis (Said & Kasanga, 2016), and quantitative cluster analysis (Philipps, 2012). The present study adds to this diversity by employing the Sociology of Knowledge Approach to Discourse (Keller, 2011), which is championed as complementary to existing social movement research (Ullrich & Keller, 2014) and has several properties that make it well suited to the research questions at hand. First, it explicitly includes visual discourses in its scope. Second, it offers theoretical tools for addressing struggles between different discourses on the same contested topic, which it conceptualizes as a *discursive field*. Third, it was developed through the study of waste discourses and has been applied to a range of other environmental issues, demonstrating its suitability for their analysis in particular.

It defines discourses as 'regulated, structured practices of sign usage in social arenas which constitute smaller or larger realities' and which 'crystallise and constitute themes in a particular form as social interpretation and action issues' (Ullrich & Keller, 2014, p. 11). This particular form can be made tangible and subjected to systematic analysis through the concept of the *phenomenal structure*. A phenomenal structure consists of a number of dimensions along which a discourse conceptualizes its theme. Frequently encountered dimensions are 'the determination of the kind of problem or theme of a statement unit, the definition of characteristics, causal relations (cause-effect), and their link to responsibilities, problem dimensions, value implications, moral and aesthetic judgments, consequences, [and] possible courses of action' (Keller, 2011, p. 58). Keller goes on in the same paragraph to include *subject positions* as yet another dimension of the phenomenal structure. The subject positions included in a discourse, elsewhere described as *identity offerings* (Ullrich & Keller, 2014), are the roles which the discourse makes available for people to identify with, or identify others as—for example, 'heroes, rescuers, problem cases, sensibly, (sic) and responsibly acting individuals, villains and so on' (Keller, 2011, p. 58).

In this study I employ the Sociology of Knowledge Approach to Discourse to analyze the phenomenal structure of the aviation-related discourse conveyed in visual protest materials displayed at Swiss climate demonstrations, particularly with respect to problem definitions, subject positions, and suggested solutions. Each of these aspects sheds a light on how this discourse might affect tourism: Which types of aviation does it target, which roles does it assign to different actors, such as tourists or the aviation industry, and which solutions does it push for?

For the application of the Sociology of Knowledge Approach to Discourse to social movement discourses, Ullrich and Keller (2014) suggest an iterative hermeneutic method that draws heavily on qualitative methodology, particularly aspects of grounded theory. Following these suggestions, I first coded all visual protest materials according to descriptive characteristics drawn from the literature: Following Philipps (2012) I coded estimated size (larger/smaller than 30x40 cm), design (printed/hand-painted), punctuation, and signs of organizations. Following Shiri (2015) I noted the number of words and the language(s). Inspired by Alekseevsky (2012), I noted humor. I also noted text color and the use of rhymes.

Second, I analyzed the semantic content of the verbal and visual elements of the protest materials. Prior to analysis, I deliberately suspended my expectations to avoid bias. In several iterations of examining the raw data, I first coded basic verbal content (e.g. 'warming temperatures') as well as basic visual elements (e.g. 'aircraft'). I then iteratively merged similar codes (e.g. 'consequences of climate change') or distinguished them more clearly, and further differentiated particularly interesting codes (e.g. 'aircraft with Swiss flag'). Codes based on verbal and visual elements were developed separately. Next, I applied higher-order theoretical concepts from the Sociology of Knowledge Approach to Discourse (such as 'subject position') to the data in order to investigate the phenomenal structure of the studied discourse. At this stage, some high-level categories were created which encompassed verbal and visual elements (e.g. 'emissions as antecedent to climate change'). Finally, I generated interpretations and compared them against alternative interpretations. Throughout all stages of coding, interpretation, and writing, I repeatedly referred to the raw data to ensure validity. Analyses were performed using the qualitative analysis software NVivo 12.

2.2.3. Collection and analysis of Swiss media data (RQ2)

The observation that the studied protest discourse did not include technological innovation or carbon offsetting as solutions to the climate impact of aviation raised the question whether these solution types were included in the Swiss mainstream media, and therefore whether their absence from the protest discourse indicated a meaningful divergence. To address this question, I composed a sample of pertinent media pieces which had been published within a period of 30 days prior to each demonstration, excluding the day of the demonstration itself. This time frame was chosen to prevent direct influence of the demonstrations on the media articles. Because

the second and third demonstration took place on consecutive days, only two time periods resulted.

The media analysis is limited to German-speaking Switzerland. I selected media outlets with high consumption levels in the general population, particularly among young people, while striving for a diversity of publication types. The publications had to be accessible and searchable online. These criteria led to the selection of *20 Minuten* (the most read free daily newspaper), *Tages-Anzeiger* (the most read mainstream newspaper), and the TV and radio channels of SRF (the most popular broadcasting company).

I searched each outlet for four key terms related to aviation, within both time periods, before moving on to the next. I screened the titles and short descriptions of all identified articles and discarded those which did not seem to discuss climate change. In a second round, I checked the full texts/files and discarded those which did not sufficiently discuss both aviation and climate change. The final corpus contains five articles and three video files from the first time period and 15 articles, four video and four audio files from the second time period. Note that the larger number of media pieces during the second time period should not be interpreted as reflecting an increase in problem awareness, because news media coverage critically depends on individual events, such as in this case a sailing trip by Greta Thunberg across the Atlantic.

Again using NVivo 12, I conducted a deductive quantitative content analysis of the media data, using the solution types observed in the protest materials as a coding framework. I read, watched, or listened to each media piece twice, noting if any of these solution types were mentioned. When a solution was suggested which had not appeared in the protest materials, I created a new category. I then compared the visual protest materials and the media data.

3. Results and discussion

This section presents and discusses the findings of this study. Subsection 2.3.1 describes visual characteristics of the collected visual protest materials, in order to provide background for the interpretation of the protest discourse and a basis for comparison with future studies. Subsequent subsections cover findings related to research questions 1a (subsection 2.3.2), 1b (subsection 2.3.3), 1c (subsection 2.3.4), and research question 2 (subsection 2.3.5).

3.1.1. Characteristics of the collected visual protest materials

Table 1 summarizes descriptive features of the collected visual protest materials. Note that two materials appeared at more than one demonstration. In the three cases where a material has two distinct sides related to aviation, both sides are counted separately throughout this paper. In addition to the stand-alone stickers listed in Table 1, more stickers were attached to placards which themselves related to aviation; this compound protest material was then counted as a placard. 'Image elements', in Table 1 as well as throughout this article, refers to shapes and symbols which I clearly recognized as denoting something.

Among those materials featuring verbal text, the average number of words is 5.12, similar to that found by Shiri (2015), with a range of 1 to 18 words. 'Zug'/'Flug' (German for 'train'/'plane') is the most common rhyme.

Most materials are hand-painted, indicating an unorganized, non-professional pattern of production (Philipps, 2012), which may in part be due to Klimastreik/FFF's policy that other organizations are not allowed to display their logos or names at Klimastreik/FFF demonstrations (Wetzel, 2019). Indeed, the only organizations referenced recurrently and directly on the materials—usually through stickers—are Klimastreik itself and the related campaign Flugstreik.

3.1.2. Problem definitions in the visual protest materials (RQ1a)

While most of the studied materials exclusively target aviation, a large minority (39) set it within a larger problem frame through verbal or visual means. Most frequently, this includes other transportation modes

Table 1
Descriptive features of the collected visual protest materials.

Descriptive feature	Visual protest materials
Total	93
Place and time of collection	
Zürich, May 24th 2019	21
Zürich, September 27 th 2019	25
Bern, September 28 th 2019	50
Type of material	
Sculpture	3
Banner	4
Stand-alone sticker	6
Placard	80
Sign/name/implication of an organization	21
Flugstreik	11
Klimastreik	7
Verkehrs-Club der Schweiz	4
Other	4
Estimated size (only banners and placards)	
Large (more than 30x40 cm)	75
Small (less than 30x40 cm)	7
Production method (only banners and placards)	
Hand-painted	80
Printed	2
Hybrid	2
Image elements (identical stickers counted only once)	65
Verbal elements (identical stickers counted only once)	83
Stylistic device (identical stickers counted only once)	
Text in more than two colors	18
Rhyme	21
Humor	23
Capitalization (identical stickers counted only once)	
All capital letters	40
Standard capitalization	23
Capital letters for emphasis	11
Capitalization according to other rules	7
No capital letters	2
Language (identical stickers counted only once)	
Standard German	54
English	17
Swiss German	9
Bilingual (English & German/French)	3
French	1
Punctuation (identical stickers counted only once)	23
Exclamation mark	16
Question mark	3
Comma	3
Period	2

dependent on fossil fuels but can also extend to fossil fuel use more widely, greenhouse gas emitting practices, or environmental degradation in general. This contextualization is unsurprising as the materials were collected at demonstrations protesting climate change.

Almost all verbal explanations for why aviation is a problem relate to climate change: Some materials reference *consequences of climate change* (Figure 1, bottom left) or *emissions as an antecedent of climate change* (Figure 1, bottom right). Only CO₂ emissions are explicitly named, and are therefore used synonymously with ‘emissions’ throughout the following interpretation. Other materials more vaguely mention *general damage to Earth* or to the climate as the problem (Figure 1, top right). It seems that some common knowledge about the causal chain from aircraft operation to CO₂ emissions, from CO₂ to climate change, and from climate change to specific manifestations is presupposed, as each material typically only addresses one link in the chain. One material mentions pollution; whether this also refers to greenhouse gas emissions is unclear. Alternative problematization strategies that appear in other discourses on aviation, such as negative effects of air travel on health, unpleasant aspects of the air travel experience, or a social critique of air travel practices as unjust, are not employed.

Visually, aviation is problematized through the depiction of aircraft crossed out in red (Figure 1, top left; see also Meier, 2019) and contained within prohibition signs, trailing visible emissions (Figure 1, top left, top

right), or cracked open with a tree growing from the wreckage (the logo of the anti-aviation organization Flugstreik, present on stickers and imitated in sculptures). Aircraft are also presented as part of dystopic scenes juxtaposed with aircraft-free utopias. Together, these visual strategies of problem-framing are quite common, comprising 33 of 51 aircraft depictions. They define aviation as a problem at first glance. Notably, no humans are shown flying in or boarding aircraft; the aircraft itself symbolizes the criticized practice of air travel, as Meier (2019) has also observed for various vehicle types. In two cases, aircraft are even anthropomorphized with unhappy facial expressions.

Which types and aspects of aviation are problematic and why is mostly specified verbally. 11 materials oppose short-distance flights (all with a popular slogan translating to ‘Short distance flights only for insects’), followed by international/long-haul flights (3), leisure travel (2), and military aircraft (1). In addition to the two explicit mentions of leisure travel, one material visually depicts a car moving towards a stretch of sand with palm trees, which seems to symbolize a holiday destination. As there is no mention of air freight, while travel is addressed, the protest appears to be on air travel rather than aviation per se. Similarly, as leisure travel is the only travel purpose that is explicitly mentioned, it can be assumed that this is the primary type of travel which the protesters bearing the visual protest materials had in mind. The protest discourse is therefore interpreted in the following as pertaining predominantly to leisure travel.

Notably, eight materials feature the Swiss flag painted on aircraft, most often on the tail fin in the style of Swiss International Air Lines, which may reflect a perceived responsibility on the part of Switzerland or its flag carrier (Figure 1, bottom left).

3.1.3. Subject positions in the visual protest materials (RQ1b)

The studied materials rarely contain explicit mentions of responsibility or blame. They don’t mention justice themes, which frequently appear in some other discourses on aviation and climate change (such as uneven distribution of air travel in correlation with wealth; private jet use; unequal CO₂ emissions attributed to first-class, business, and economy seats; varying necessity of different travel purposes). Implicitly, however, some responsibility is assigned through the positioning of subjects.

Fewer than half of all materials with verbal elements reference any subject. The majority is phrased impersonally (e.g., ‘Trains not planes’), and some position the act of flying as the subject (e.g. ‘Flying destroys our planet’), both of which avoids the placing of responsibility.

However, subjects appear in 32 materials in the form of a) personal (‘we’) and possessive pronouns (‘our’); b) imperatives without pronouns (‘Stop flying’); and c) explicit naming (‘Mother Earth’). They can be classified into three subject positions: *victim*, *problem causer*, and *potential problem solver*. Figure 1 displays examples and shows how intimately these three positions are interwoven. The latter two overlap especially heavily (Table 2) because the suggested way in which one can become a problem-solver often equates to discontinuing a currently exhibited problem-causing behavior (e.g. ‘Stop flying’). Indeed, the audience is predominantly addressed through appeals to reposition themselves from being problem causers to being problem solvers.

The problem solver position is only ever presented as *potential*; existing ‘environmentally friendly’ behavior (such as having pledged not to travel by air) is never mentioned, foregoing any ‘heroine/hero’ position. Not even Greta Thunberg’s refusal to fly is mentioned.

Self-positioning occurs across all subject positions. The victim position is never assigned to the audience, only to the self and third parties. The discourse speaks mostly about the demonstrators and viewers, not governments or other societal groups.

3.1.4. Proposed ‘solutions’ in the visual protest materials (RQ1c)

Many materials (38) discuss (usually verbally) ‘solutions’; the term is hereafter placed in quotation marks to underscore my abstention from evaluating the suggestions. The suggestions are summarized in Table 3, along with corresponding suggestions in the media (see section 2.3.5). Notably, only one material rejects an undesired ‘solution’, while the rest promote



Fig. 1. Examples of aviation-related visual protest materials. Caption translations: Top left = ‘Stay on the ground’. Top right = ‘Flying destroys our planet’. Bottom left = ‘Fly even more then there will be no snow’. Bottom right = ‘For our grandchildren & children – Stop CO₂—No SUV—No [aircraft]’. The materials displayed here illustrate the subject positions *potential problem solver* (top left, bottom right), *problem causer* (top left, bottom left, bottom right), and *victim* (top right, bottom right). They further illustrate the problem definitions *general damage to Earth* (top right), *emissions as antecedent to climate change* (bottom right, visual evidence in top left and right), and *specific consequences of climate change* (bottom left, visual evidence in bottom right).

desired ones. The most promoted ‘solution’ is the *substitution of air travel with train travel* (Figure 1, top left), closely followed by *monetary measures* and *individual behavior change*. There is some overlap between these categories.

Interestingly, a range of ‘solutions’ from other discourses on air travel and climate change are missing from the visual protest materials. State regulation of travel is not explicitly mentioned, but the visual representation of aircraft within prohibition signs may be intended as an allusion to regulation. Definitely missing are the possibility of limiting advertising for air travel, carbon offsetting, virtual communication, and technological means to improve the carbon efficiency of aircraft. One material (Translation: ‘Only witches fly CO₂ neutral’) explicitly denies the possibility of carbon-neutral aviation, but apart from this single instance, it is unclear from the protest materials alone whether the omission of some types of ‘solutions’ is due to ignorance, deliberate rejection, or yet another reason.

3.1.5. Proposed ‘solutions’ in Swiss mainstream media (RQ2)

To investigate this absence of some solution types from the visual protest materials, I conducted a content analysis of the ‘solutions’ proposed in Swiss mainstream media, using as a coding framework the categories which had emerged from the analysis of the protest materials, with additional categories allowed to emerge. I compared the ‘solutions’ suggested

in both datasets to identify commonalities and differences (research question 2). This approach is based on the assumption that the Swiss public, including protesters at the studied demonstrations, would likely know about the existence of any ‘solutions’ discussed by popular Swiss mainstream media. Therefore, if a ‘solution’ type is discussed in the media but not the protest materials, its omission likely reflects a lack of faith of the protesters in this ‘solution’, rather than ignorance.

While the protest materials almost exclusively promote desired ‘solutions’, media discussions of many ‘solutions’ include both supportive and critical voices. Of the 29 media pieces that discuss potential ‘solutions’, about half mention substituting air travel with train travel (Table 3). This category includes the same ‘solutions’ as in the protest dataset (cheaper trains, individual choice, more night trains) but also the expansion of existing train options as well as the development of more sustainable train engines. Unlike the protest materials, the media discuss a specific measure for making train travel cheaper: the removal or decrease of value-added tax on train tickets. An equal number of media pieces discuss monetary measures. This category encompasses the same ‘solutions’ as in the protest dataset.

Fewer media pieces discuss individual behavior change. As in the protest materials, this category includes eliminating air travel, staying close to home, and substituting air travel with train travel or other alternative

Table 2

Aviation-related visual protest materials implying subject positions (total = 32).

	Total protest materials	Subject position		
		Victim (subtotal = 7)	Problem causer (subtotal = 21)	Potential problem solver (subtotal = 21)
1 st person singular	1		1	
2 nd person singular	4		4	3
3 rd person singular	1	1		
1 st person plural	9	6	4	3
2 nd person plural	3		1	2
3 rd person plural	2	1	1	
Undefined imperative	14		10	13

Note: Rows need not add up to the column subtotal because some materials include more than one mention of subjects.

Table 3

Frequencies of 'solution' types in aviation-related visual protest materials from Klimastreik/FFF demonstrations and Swiss mainstream news media.

'Solution' type	Protest materials	News media
Total^a	38	29
Substitution with train travel	19 (50%)	13 (45%)
Cheaper trains	x	x
Choosing train over plane	x	x
More night trains	x	x
Expansion of (international) train options		x
More sustainable train engines		x
Monetary measures	16 (42%)	14 (48%)
Cheaper trains	x	x
Opposing cheap flights	x	x
Taxing aviation	x	x
Individual behavior change	14 (37%)	9 (31%)
Choosing train over plane	x	x
Eliminating air travel	x	x
Reducing air travel	x	
Other alternative transport (e.g., biking)	x	x
Staying close to home	x	x
Staying longer		x
Offsetting	0	5 (17%)
Technological 'solutions'	0	5 (17%)
Electrification		x
Biofuels		x
More fuel-efficient aircraft		x
Regulations	0	4 (14%)
National level		x
Institutional level		x
No new military aircraft	0	1 (3%)
Opposing airport expansion	1 (3%)	0

Main categories are listed in bold font, sub-categories are listed in normal font to further define the main category. Sub-categories are marked with an x if they are present in the respective dataset; otherwise they were not mentioned.

^a Total = number of data pieces in the respective dataset featuring 'solutions'

modes of transport. Additionally, the media discuss staying longer at destinations and name a larger palette of alternative transport options, including sailboat, bus, car, and ship. Reducing air travel rather than eliminating it is not explicitly mentioned, but the difference between both may have been more difficult to tell in the media articles than in the more straightforward visual protest materials.

As evidenced by the above paragraphs, media and demonstration discourses match in regard to some 'solution' types. However, there are also differences. Opposition to airport expansion, as suggested in one visual protest material, is missing from the media discourse, and the media discourse includes carbon offsetting, technological 'solutions' (including electrification, biofuels, and the development of more fuel-efficient or even emissions-free aircraft), and abstention of the state from purchasing new military aircraft, none of which appear in the protest materials. Regulations at the institutional and national level are also discussed by the media, while their implication in the protest materials is uncertain.

Opposition to airport expansion and the non-purchase of military aircraft, both of which are only suggested once across both datasets, are negligible for the comparison of the two discourses. The uncertain status of regulations as a promoted 'solution' in the protest materials also prevents a comparison regarding regulations. However, it seems that the protesters chose not to promote technological 'solutions' or carbon offsetting, even though many likely possessed some knowledge of these 'solution' types from the mainstream media.

3.2. General discussion

Table 4 summarizes key findings regarding the phenomenal structure of the visual protest discourse on aviation and climate change, as expressed by protesters at Swiss Klimastreik/FFF demonstrations. In the following, I interpret these different dimensions more generally and in relation to each other as well as to the media discourse.

Table 4

Phenomenal structure of the visual protest discourse of aviation.

Dimension	Key aspects
Problem definition	Focus on leisure travel and short-distance flights Causal chain, knowledge presupposed:
Subject positions	- Aircraft emit CO₂ - CO₂ causes climate change - Climate change has negative consequences Victim Problem causer Potential problem solver
Suggested 'solutions'	Substitution with train travel Monetary measures Individual behaviour change

The protest discourse refrains from identifying any particular individuals or groups as responsible for the climate impact of aviation or for solving this problem. Thus everybody's air travel is painted as equally bad, which glosses over questions of unequal distribution of consumption (who travels more; which travel is more damaging, or more justified) and power (who is free not to travel; how is travel demand created; who can initiate change). The discourse even erases human agency from the story it tells by using impersonal grammatical structures (observed to the same effect by Meier, 2019), depicting aircraft exclusively without pilots or passengers, and visually villainizing and even anthropomorphizing them. Where responsibility is assigned at all, often implicitly through verbs and pronouns that construct subject positions, it is generalized to the travelling public, under which the demonstrators subsume themselves as well as their viewers. Travelers are considered responsible both for causing the environmental impacts related to air travel and for reducing them.

Correspondingly, the most promoted 'solutions' (substitution of air travel with train travel, monetary measures, and individual behavior change) in the protest discourse rely on decreased air travel demand across the board, which is to be realized largely through better choices on the part of the public, although aided by monetary interventions or improved infrastructure. Governments appear in this phenomenal structure only as the implicit addressees of calls for such monetary interventions and improved infrastructure.

Technological 'solutions' such as electrification, biofuels, and efficiency gains in aircraft are not promoted at Klimastreik/FFF demonstrations. They are, however, discussed in popular Swiss mainstream media and therefore likely known to the protesters. The omission of these 'solution' types from the Klimastreik/FFF protests therefore appears as a silent rejection, or at the very least a discounting of these 'solution' types relative to 'solutions' which focus on reducing air travel demand (for air freight, which is not discussed in the protest materials, the case may be different). Interestingly, this matches the discourse of the international environmental group *Stay Grounded*, which explicitly rejects offsetting and technological 'solutions' (Haßler et al., 2019).

If the omission of these 'solution' types from the observed protest discourse is indeed intended similarly, this raises three interesting points. First, it is worth noting that both offsetting and technological 'solutions' are heavily promoted by the aviation industry (Gössling & Peeters, 2007; Peeters et al., 2016). The protesters therefore seem to be consciously or unknowingly resisting the industry's claims that it can become sustainable through innovation.

Second, people who are aware of the environmental impact of air travel are more likely to report considering, or having actually purchased, carbon offsets (Oswald & Ernst, 2020). Since the Klimastreik/FFF protesters clearly demonstrate such awareness, their rejection of offsetting contrasts with this finding. But perhaps both observations can be reconciled: Oswald and Ernst (2020) find that the association of awareness of the impact of air travel and engagement with offsetting is mediated by the experience of a dilemma between one's travel and one's environmental attitudes. Perhaps environmentally aware people purchase offsets privately in response to this dilemma, but feel ambivalent about the practice and thus aren't willing to stand up

in a crowd of demonstrators to defend it, especially if the social norms within environmentally aware social circles are indeed transitioning away from air travel. This ambivalence would be interesting to explore for research on offsetting, but also from a methodological point of view, because it might give insight into the discursive rules that govern which opinions are expressed on visual protest materials.

Third, Brand and Fischer claim that in environmental discourses, a technosceptic position is often pitted against a *technophilic* position that promotes technological solutions over social change. Since technological fixes and offsetting share a reliance on technology, rejecting these ‘solution’ types in favor of the demand- and behavior-based ‘solutions’ promoted in the protest materials would place the Klimastreik/FFF protesters in the *technosceptic* camp (Brand & Fischer, 2012). On the other hand, the aviation industry would seem to occupy the *technophilic* side of the debate. Brand and Fischer (2012) criticize such bipolarity as ineffective and argue for a more holistic view of technological and social change as intricately connected and equally necessary for the shift to a sustainable society. This line of argument would call for the an integrated perspective on ‘solutions’ for the climate impact of air travel, for example as put forth by the UK’s Climate Change Committee (2020).

3.3. Limitations

This study is limited in several ways by the relative novelty of using visual protest materials as a primary data source. Visual protest materials have a limited capacity to accommodate complexity and tend to focus on isolated, straightforward aspects of an issue. It is therefore likely that their analysis cannot reveal all the dimensions of a movement’s studied discourse, but rather shines a spotlight on the most salient aspects. My focus in this study on more easily interpretable verbal and symbolic content, rather than, for example, a more hermeneutic interpretation of image composition or word choice, further limits the range of insights that can be drawn from the study.

Further, comparing the ‘solutions’ suggested in the visual protest materials to those discussed in media articles involves the assumption that on principle, all types of potential ‘solutions’ can be featured, and would be equally likely to appear, in both mediums. Whether this is true is currently unknown.

Another type of limitation concerns the generalizability of the findings. First, if certain groups of protesters are more likely than others to carry visual protest materials, as observed by Alekseevsky (2012), then the collected data may over-represent the point of view of these groups. In Alekseevsky’s (2012) study, visual protest materials were most likely to be carried by young, working people with high education levels. It is possible that the data analyzed below are biased toward this demographic, although the studied context is quite different from that studied by Alekseevsky (2012) and may therefore have produced a different, unknown bias favoring another subgroup.

Second, I examined demonstrations organized by a specific social movement organization in a small European country. Based on the survey by Moor et al. (2020), which shows that the attendees of one of the studied demonstrations had a range of affiliations with other environmental organizations, and came from various age groups, I argue that the findings can be generalized to the contemporary climate movement in Switzerland. Because the discourses of other Swiss national agents on aviation closely mirror those on an international level, it is not unlikely that the global climate movement’s discourse might resemble that of its Swiss counterpart. However, these generalizations are speculative and would require additional data to confirm.

Third, the COVID-19 pandemic has drastically reduced tourism in 2020 (World Tourism Organization, 2020) and changed the conditions for FFF, whose primary format has historically been street protest. It remains to be seen whether FFF will continue to exist after the pandemic, whether tourism – including air travel – will return to its former levels, and in which ways the pandemic will impact popular opinion on climate change, air travel, and the junction of the two. At the very least, as air travel demand is already rising again in many markets and is expected to rebound to previous levels by 2022 (Gudmundsson, Cattaneo, & Redondi, 2021), the

question of how to intervene against the climate impact of aviation will remain relevant, and although the discourse as analyzed in the present study may have shifted somewhat, a complete change concerning which ‘solutions’ are considered appropriate is unlikely.

4. Conclusions

I have analyzed the discourse of protesters at Swiss climate demonstrations regarding aviation by applying the Sociology of Knowledge Approach to Discourse to the visual protest materials displayed at these demonstrations. This analysis has revealed that the protesters problematize aviation as contributing to climate change through emitting greenhouse gases. They focus on air travel as opposed to air freight, particularly leisure travel and short-distance flights. The discourse primarily offers audiences the positions of problem causer or potential problem solver to identify with, subtly assigning responsibility for the climate impact of aviation to the travelling public. Substitution of air travel with train travel, monetary measures, and behavior change are commonly suggested as ‘solutions’ for this impact, unlike technological innovation and offsetting. In the following, I point out implications of these findings, first from a methodological and then from a practical perspective.

Despite its limitations, this study provides another example of the fruitfulness of visual protest materials as windows into the views held by members of a social movement, and shows that the Sociology of Knowledge Approach to Discourse is a suitable tool to analyze such materials, if the research interest lies on the content and structure of the protest discourse. However, it does not in itself contain tools for a detailed analysis of the design and visual composition of visual protest materials, for which the methodology proposed by Philipps (2012) is better suited. The Sociology of Knowledge Approach to Discourse can be applied to any event where visual protest materials are displayed, and with the multidimensional theoretical tool of the phenomenal structure provides the flexibility to examine basic message content (such as the suggested ‘solutions’ in this study) as well as more implicit meanings (such as the subject positions in this study).

The usefulness of visual protest materials as data could be improved further with more detailed knowledge about typical and atypical features of protest materials, as well as the discursive functions of each feature. Therefore future studies based on visual protest materials should by default report at least some basic features of the sampled materials, for example along the dimensions described by Philipps (2012) or in this article. Other methodological challenges currently limiting conclusions based on visual protest materials should also be addressed, for example by investigating whether the views of particular subgroups are systematically over-represented in visual protest materials, and whether certain types of ‘solutions’ are less likely to be discussed in protest materials than in other genres.

In line with observations that air travel is developing from a blind spot of environmentally aware consumers to an area of active reflection (Wolrath Söderberg & Wormbs, 2019), this study shows that aviation is an important topic to Swiss climate protesters, as evidenced by the absolute number of 93 protest materials collected. Although Meier (2019) reports only one aviation related slogan among 432 visual protest materials drawn from German FFF demonstrations, at the demonstrations I observed such slogans were easy to find. This divergence may be due to the different methodologies employed, as Meier’s sample was drawn from social media accounts of official FFF groups, which may not have been representative for the demonstrations.

The key finding of this study from a practical perspective is that environmentalists have taken up the topic of air travel and are resisting the aviation industry’s discourse of sustainable aviation involving technological innovation and carbon offsetting. Instead, they insist on reduced air travel demand, brought about by individual choice aided by monetary intervention and better infrastructure. Whether this discourse, or deeper anti-aviation currents within the climate movement of which the observed discourse may be indicative, will succeed in affecting public opinion, travel patterns, or transport policy is uncertain, and invites future research. However, given the potential impact of protest on society (Banaszak &

Ondercin, 2016; King et al., 2007; Madestam et al., 2013), such an influence is certainly possible. The aviation and tourism industries should prepare for this possibility in planning their recovery after the COVID-19 pandemic. While reduced air travel demand could entail heavy losses for the aviation industry, as well as other tourism subsectors and destinations, some subsectors, such as rail services and European travel destinations, could stand to benefit from such a change. These players could seek synergies with the climate movement in order to advance the transition toward sustainable tourism that takes into account not only environmental behavior at the destination, but also the mode of transportation.

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Statement of contribution

1. What is the contribution to knowledge, theory, policy or practice offered by the paper?

The paper illustrates that the demand for a reduction of air travel has become a substantial tenet of the current wave of ecological protest. It also shows that climate protesters mostly promote measures based on demand reduction, calling for potentially far-reaching changes in travel patterns which would impact the tourism sector. Conversely, they ignore technological fixes which would not require behavior change. Although whether these views will gain traction in society is uncertain, a sea change in public attitude about tourism – tipping towards short-haul destinations that can be reached without air travel – is a possibility for which tourism planning should prepare. Some tourism actors may even be able to harness synergies with the environmentalists.

2. How does the paper offer a social science perspective / approach?

The paper is exclusively social science oriented in its research questions and methodology. The object of study is the perspective of a social movement aiming to change societal views and behavior patterns, the political landscape, as well as institutional and technological structures. To this end, the paper employs qualitative and discourse analytical concepts and methods developed by the social sciences. It applies the Sociology of Knowledge Approach to Discourse, which emphasizes the interconnections between language, social practices, institutions, and material reality.

Data availability statement

Data are available for review upon inquiry to the author, but are not available to share publically.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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