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Climate crisis and flying: social media analysis traces the rise of “flightshame”

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ABSTRACT

Even before the global halt to extensive mobility due to the coronavirus crisis, there has been growing resistance amongst some groups to flying. Reflecting increasing concern about the imminent climate emergency, the phenomenon of feeling ashamed of flying and expressing related emotions through communication has resulted in the neologism “flygskam”. Drawing on 14,212 Twitter posts that contained “flygskam” and a further 1037 using the English “flightshame”, this research examined the spatial-temporal spread of these words from Sweden starting in 2016 to the rest of the world indicating a global phenomenon. The findings indicate that national context continues to be important in understanding the nexus of individual and social sensemaking and processing of new information. They also demonstrate, however, that global networks (facilitated through social media) might challenge the needs of physical mobility as requirements to connect, exchange views, and create identity through peer group membership. Further analysis of the content revealed key perspectives and topics, providing insight into the relatively homogeneous discussions amongst a network community. Only 6% of posts rejected the notion, whilst the majority indicated support and advanced suggestions for more sustainable alternatives. It might be too early to say whether language behaviour expressed in online communication translates into real behaviour, but the current pandemic may well provide further impetus to no-fly movements by way of a strategic alliance between different peer groups.

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Introduction

The current experience of the global Covid-19 pandemic shows how quickly complex social systems can change once existential fear about potential threats morphs into widespread political consent (Friedl, 2020a). Some of the responses to the coronavirus crisis are not dissimilar to those that have been urged by many climate scientists for years. The need to rethink our global transport systems and the “necessity” of flying (Gössling et al., 2019, p. 81) that contributes an

increasing share of anthropogenic GHG emissions is particularly relevant in the context of this paper. The present (almost) standstill of global aviation follows increased attention to aviation as a key contributor to the climate emergency (The Club of Rome, 2018). The term “climate emergency” was *Oxford Dictionary’s* word of the year in 2019 (Rice, 2019), epitomising the backdrop against which this study was conducted.

Increasing climate concern and anxiety (Taylor & Murray, 2020) manifest in growing resistance amongst some to personal flying and to aviation-related developments (e.g. runway extensions). As noted by Gössling et al. (2020), the phenomenon of feeling ashamed of flying is talked about more widely. A new word emerged that describes this feeling: “flygskam” (Swedish for flight-shame). Shame, it appears, is triggered for some people when their environmental concern (and their view of who they are) conflicts with activities that obviously contribute to GHG emissions. The semantics of this new compound term is in stark contrast to previous representations of flying as a privilege and luxury activity, that is associated with excitement, opportunity and status (as institutionalised in so-called “status points” that form part of many frequent flyer programs), that reduce the likelihood for some to give up air travel (Cohen & Higham, 2011). It also runs counter to firmly embedded (at least in Western Society) expectations expressed in the new mobilities paradigm (Sheller, 2017), and its inter-connectedness with socio-material systems. Whilst the “established” system and value orientation, including its collective actions and peer groups, might reward frequent air travel as a positive contributor to the community (e.g. as it might support economic activity), an emerging alternative “community” might interpret flying as a socially devaluating activity that consequently is not only connected to the loss of status (i.e. social value) but also feelings of shame (Durkee et al., 2019; Robertson et al., 2018). The notion of shame connects closely to research on guilt and environmental attitudes as a driver of behaviour (Onwezen et al., 2013), in this context flying (e.g. Bösehans et al., 2020; Higham & Cohen, 2011; Young et al., 2015). Whilst the science differentiating shame and guilt remains ambiguous, both concepts reflect “self-conscious emotions” (Teroni & Deonna, 2008, p. 725) with some proposing that shame tends to relate to societal factors and perception of self, whereas guilt concerns individual behaviour and actions (Naso, 2007).

Opinions on flying are shared via various types of media (Gössling et al., 2020; Mkono et al., 2020), and the language used provides insights into potential societal shifts. Arguably, language provides a means for individuals to share thoughts and feelings and respond to stimuli transmitted by others (Krauss & Chiu, 1998). Language evolves and new words are formed, and the meaning of existing words changes. The words contained within language have been the subject of research by many scientists interested in the field of communication (Friedl, 2015). Neologisms, or new words, are particularly informative from a research point of view because they emerge in response to new phenomena or fashions. Regardless of whether neologisms are transient or persistent, they represent creative expressions of emerging or changing representations that are exchanged amongst certain groups of people. One common type of neologism is a combination of existing words (Behera & Mishra, 2013), such as flight and shame. The question then arises whether the neologism of flightshame reflects an evolving representation of airborne mobility that is being renegotiated as individuals make sense of new information and collective experiences (Krauss & Chiu, 1998). More specifically, the word flightshame might reveal the coordination of a peer group whose values oppose traditional views on, inter alia, growth, development and status, and replace them with paradigms about planetary limits, consciousness of global challenges, justice and solidarity. This research provides early insights into potential shifts, especially as changes in perspectives could be accelerated due to the Covid-19 crisis.

Examining how “flightshame” has entered common language behaviour might provide insight into the existence and coordination of new groups. “Listening in” on conversations is to some extent made possible by examining social media activity. Social media channels have become increasingly influential in exchanging information, mediating discussions on topical issues, and giving users the opportunity to create their own stories or share opinions (Roxburgh et al.,

2019). The open exchange of contrasting perspectives provides rich material to study the communication of contested topics within or across groups (e.g. see Mkono et al., 2020 on climate activist Greta Thunberg). Twitter is a particularly suitable platform for analysis because of its global reach, volume of activity and open access to data. Here we draw on Twitter posts that include the words *flygskam* or *flightshame* to track the spread of the word and the context in which it is shared. More specifically, two questions are asked:

1. How did the presence of *flygskam* and *flightshame* in Twitter posts change over time and space?
2. What does the content of *flightshame* tweets reveal in terms of key topics and opinions that people share online?

Literature review

The emergence of feeling ashamed of flying has occurred in the context of accelerating climate change. An increasing number of experts are now expressing grave and public concern about the prospect of climate collapse within a wider ecological crisis (e.g. Steffen et al., 2018). The 1.5 degree Celsius (°C) report by the Intergovernmental Panel on Climate Change, for example, calls for drastic reductions in GHG emissions and transitions of an “unprecedented scale” (IPCC, 2018, p. 17). The Stockholm Resilience Centre (2019) has modelled the implications of the current emission trajectory and labelled the resulting conditions “Hothouse Earth”, with some parts of the planet becoming uninhabitable. A global movement to declare a climate emergency reflects concerns about the “existential risk to humanity” voiced by The Club of Rome (2018, p. 5).

Not surprisingly, advances in the scientific understanding and extreme weather events have been reflected in increasing media coverage of climate change (Boykoff & Pearman, 2019). The “Covering Climate Now” campaign in September 2019 provides an example where over 250 newsrooms globally pledged to increase both volume and visibility of climate change in their reporting (Spencer, 2019). Social media play an important role in the wider dissemination of climate change facts and interpretations, both from centralised media accounts and through decentralised peer-to-peer networks (Bastos et al., 2018). Air travel has received considerable attention in both mainstream and social media, possibly because it is a desirable activity that many people in the Western world can relate to (Kantenbacher et al., 2019). Yet, aviation is one of the fastest-growing sources of GHG emissions (Becken & Pant, 2019), making it, quite simply, a highly contentious societal issue. Because social media are known to constitute a platform for ideological debate and digital activism (Ciszek, 2016), they provide a suitable source of data to examine how people exchange views (Figure 1).

When people are exposed to (new) information on climate change or the specific links between air travel and emissions, then this acts as a stimulus that people have to make sense of when forming their own realities (and identities) through never-ending learning. If and how people absorb new information depends on many factors, including whether the information is recognised as being transmitted from a related (friendly) social network, or whether it comes from outside a relevant peer group. Thus, in response to a range of signals and filters, people construct their own reality of climate change and what it means to them (Weber, 2016), and they achieve this by accommodating new information into existing mental schema (Whitmarsh, 2011). This is often operationalised through the use of particular language (Byrnes, 2008), especially amongst peer groups. When understood as a system (Bertalanffy, 1968), communication consists exactly of these inputs, outputs and other elements (e.g. feedbacks) that play out in a particular context.

When confronted with “climate change-related signals”, brains develop new patterns (and become “configured”), and these interact with existing ones in ways that align, differ or conflict

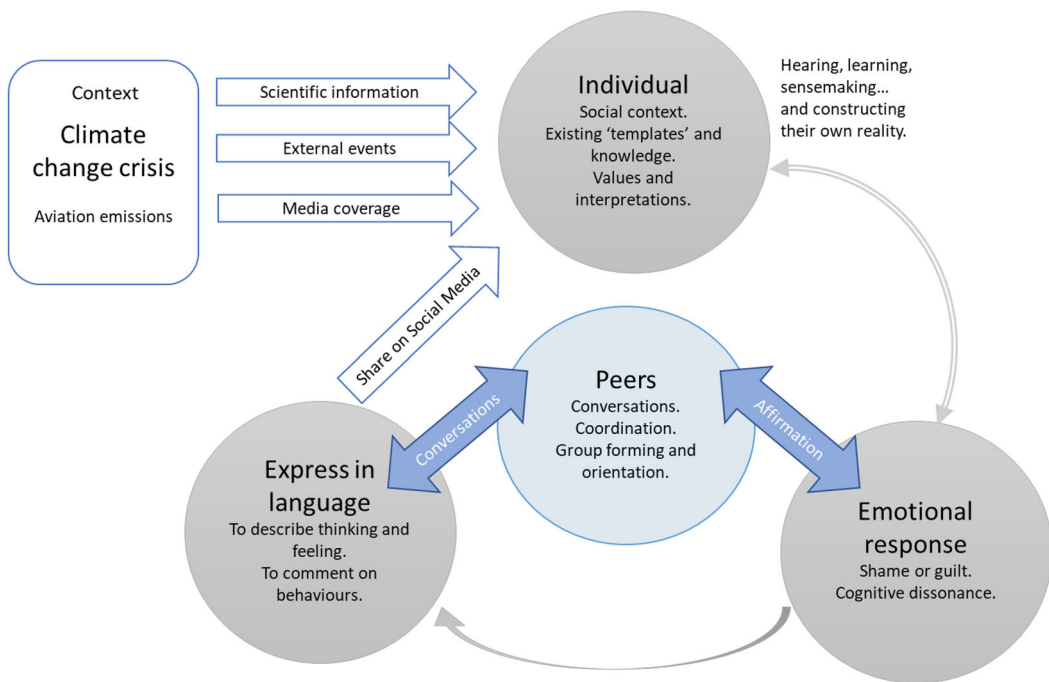


Figure 1. Conceptual model underpinning the analysis of Twitter posts on flightshame.

(Hüther, 2016). New information can lead to stress reactions, including fear or aggression. In other words, emotions are the expressions of neurocomputational adaptations when exposed to new problems. How people feel when being confronted with climate change triggers depends on their previous learning experiences and their context (Figure 1, bottom right), but also the peer groups an individual identifies with and seeks affirmation from (Tichon, 2015). Shame about flying is an emotional reaction based on a specific cultural setting and group, according to which people must accept the consequences for their behaviour in order to feel good. Facing a moral imperative “to do the right thing”, for example, in relation to reducing one’s carbon footprint, whilst having an ongoing desire to travel, results in an internal conflict. The interaction between negative emotions and psychological discomfort (linked to a cognitive dissonance state) is complex. Arguably, the most influential theory in understanding psychological stress due to inconsistencies in attitudes and behaviours is Festinger’s (1957) Cognitive Dissonance Theory. Significant gaps in understanding remain, however, and further research into different cognitive dissonance paradigms (including the hypocrisy paradigm) and feelings of shame or guilt would be beneficial (Bran & Vaidis, 2020).

Whilst the psychological links between dissonance and adverse feelings are beyond the scope of this paper, it is important to acknowledge the link between values, attitudes and social representations (Bidjari, 2011) as well as social identity (Cocolas et al., 2020). Teroni and Deonna (2008) suggest that “shame would arise as a failure to live up to standards set forth by the ego-ideal, guilt as a result of violating prohibitions imposed by the superego” (p. 727). Negative states (e.g. dissonance) or emotions such as shame or guilt can provide a “drive” to make adjustments to either one’s attitudes or behaviours (Cocolas et al., 2020; Onwezen et al., 2013), including language behaviour. These changes are often predictable, even though they do not necessarily conform to rational decision making (Hosseini, 1997). The magnitude of the discomfort, and the need for adjustment, depends on how important the affected values are (i.e. discrepancy is salient and substantial), and how psychologically close individuals are to the particular issue. In the case of flying, people can respond in different ways, for example by

resorting to various mechanisms of denial (Becken, 2007), or – and increasingly promoted by the industry – by purchasing carbon offsets (Becken & Mackey, 2017; Bösehans et al., 2020) that are deliberately marketed to reduce the “guilt of flying” (Young et al., 2015). The focus in this work is not on attitudes or behavioural change, but on the phenomenon of the neologism “flightshame” that could be an expression of people’s emotional processes and adjustments in coordination with their peer networks.

People think in languages, and languages evolve according to changing environments. Krauss and Chiu (1998), in their studies of the social psychology of language, argue that the use of language permeates life, and vice versa, social life shapes the dynamics and use of language. The word flightshame could be a consequence of an increasing number of people developing specific patterns of feeling and thinking, and articulating these through language (Figure 1, bottom left). In the context of flightshame, people increasingly wish to share their experienced or anticipated emotional states in the face of using air travel, and they often do this through social media networks. Social media are digitally supported cultures of communication with specific emotional, intellectual and verbal patterns. This structure of digital networks enables the development of new peer groups and cultures with specific values (i.e. verbal abstractions of patterns of behaviour judged as supportive to personal and collective well-being). Tweets about flightshame that are shared across particular networks may be expressions of such groups.

Whilst the word flightshame enables more refined communication, the use of the word alone does not necessarily mean that everyone understands it or experiences the same feelings when being confronted with it. Indeed, meaning is only added to a verbal pattern by relating it to emotions; and these are idiosyncratic to each individual’s context and history (Friedl, 2015). The use of the word flightshame, for some, may simply reflect an interesting topic of conversation (without users feeling shame), or it could be a politically correct way of talking about flying (e.g. in academic circles). For some, the word flightshame might represent a call for action. Because it is impossible to determine for sure what particular words mean to an individual, how they encode and recode them (Krauss & Chiu, 1998), and how they reconstruct a similar or different representation, researchers such as Worsøe (2011) stress the critical role of context within which words receive their meaning. More specifically, Worsøe describes “communication as contextualised social constructions of the participants in the situation of history and time” (p. 604). Understanding of the meaning and implications of the word “flightshame” is therefore bound by history and the time and place in which it is used. Words are more than mere “containers” that transfer meaning between two people, as suggested in traditional linguistics.

In summary, this research draws on communication studies and the role neologisms play as new words that reflect emotional responses to contemporary issues. It builds on earlier examinations of Twitter posts and public perspectives on climate change (Kirilenko & Stepchenkova, 2014), focussing specifically on the notion of flightshame. In addition to gaining a macro view of the spread of the word, this research also attempts to identify key topics and positions that people take to examine whether a shared meaning is becoming apparent in the language behaviour surrounding flightshame.

Method

Twitter is a popular platform with 330 million users worldwide (Statista, 2020), and it has been used successfully in similar studies of public perceptions on contested topics (e.g. Pearce et al., 2014; Yun et al., 2016). Twitter uptake differs by country, with the USA having the highest number of users (59 million), followed by Japan (46 million) and the UK (17 million) (Statista, 2020). The length limit of Twitter posts (tweets) is 280 characters, in addition to the possibility to insert hyperlinks, images and videos. The space limitation constitutes a constraint but can also aid analysis because the format forces users to make their point more directly.

Data collection

This research focuses on tweets that address air travel and climate change, and more specifically, posts that mention the words *flightshame* or *flygskam* (or their hashtagged versions). Using a public API, Twitter posts were filtered according to these two keywords. Different spellings of the terms (e.g. *flightshame* in separate words) were not included, as the sample was sufficiently large for robust analysis, and focusing on the original spelling eliminated ambiguity. Further, the focus of this paper is on the neologism and the context in which it is used. The content and associated metadata of each post were downloaded and stored in two Mongo databases, alongside time stamp and origin country of the account holder.

To extract Twitter posts, we developed a process for crawling historic tweets based on keywords. The crawling delivered a total of 14,212 posts that included *flygskam* back to the first mention in 2016. Stored separately, 1037 posts were found to contain the word *flightshame*. Note that we do not identify unique users, which means that these posts are likely to correspond to a smaller number of people if users tweet multiple times about the topic.

Data analysis

Temporal and spatial analysis

To understand the evolution of the neologism, all 15,249 Twitter posts were analysed in terms of their frequency over time. Days with relative peaks in activity were examined further. Alongside the temporal analysis, the origin of the user was identified to see how the use of *flygskam*/*flightsham* spread from its original appearance in Sweden. For this, we developed a python code which extracted the location that a user listed and mapped it uniquely onto a country using a dictionary of locations (<https://www.geonames.org/>). Ambiguous locations such as “EU”, “world” or “Mars” were ignored. In total, we mapped 59% of all posts to a specific country. Considering the significant number of posts this percentage is enough to demonstrate the importance of the topic in individual countries, as well as highlighting differences in geographic salience.

Examining content

To gain a better understanding of the key topics that people discussed in their posts a frequency analysis of hashtags contained in both *flygskam* and *flightshame* posts was undertaken. Hashtags are a tool to ensure wider spread and linkage to an online community of like-minded users (Erz et al., 2018). In addition, content analysis was performed manually on the *flightshame* tweets ($N = 1037$) with each tweet being one unit of analysis. Content analysis is a qualitative method that provides an objective way of quantifying information, for example by identifying concepts and creating categories that can be counted (see Elo et al., 2014). The content analysis focused on the *flightshame* dataset as the majority of posts were in English, although it emerged that 144 posts were written in other languages. The 44 German and 30 French tweets could be read directly as the authors have relevant language competency, but a small number of Italian, Spanish, Swedish and several other languages used in posts had to be translated using Google Translate.

The categories for the content analysis were both deducted from the context and generated inductively by examining posts to identify key topics. To increase reliability of the process, the coding was informed by objective identifiers where possible, for example, keywords or hashtags that articulate the core message of the post (Table 1). A conservative approach was taken in that the code “neutral” was used when the valence (e.g. in favour or against the *flightshame* concept) was ambiguous. Simply mentioning “*flightshame*” was not interpreted as being supportive of it. Since many posts referred to mitigation options, a new category was created to capture these “carbon reduction alternatives”, including the most common suggestions (i.e. sub-categories). A

Table 1. Coding framework and examples of keywords and hashtags.

Category	Explanation	Code (category and sub-category where applicable)	Keywords or hashtags as objective identifiers (examples)
Concern about climate change	Tweet refers to the wider climate crisis expressing concern and agreement	Yes, no, neutral	#climatecrisis or #climatebreakdown
Support of flightshame concept	Tweet that contained affirmative language, e.g. "... we need more flightshame ..."	Yes, no, neutral	Shame, guilt, trainbragging, stopped flying, #sustainabletravel, #flightfree, #zerocarbon
Disapproval of flightshame concept	Tweet unambiguously promoted air travel or rejected the notion of shame, e.g. "flightshame is irresponsible ..."	Yes, no, neutral	Refuse, #climatehoax, @IATA, freedom, bonkers, nonsense, travel junkie
Issues with negative framing	Posts providing a constructive critique of the flightshame concept	Yes, no	Admirable, complex, negative, narrative, Global North
Alternatives for mitigation	Suggestions of "carbon reduction alternatives" (not necessarily advocated for)	Yes, no Sub-categories: <ul style="list-style-type: none"> ● Rail, train ● Taxation/regulation ● Carbon offsetting ● Virtual/IT improvements ● Technological solutions ● Different travel and behaviours 	Train, Eurostar, tax, offsetting, compensating, video-conference, virtual, engine, electric, biofuel, slow travel, bike

tweet could contain multiple suggestions. Trustworthiness (Elo et al., 2014) was increased by the researcher revisiting the coded spreadsheet two weeks after the initial coding to verify (or adjust) the codes. This also included a systematic sense check across the categories, for example, a comparison of the code in support of flightshame versus being opposed to the concept.

Finally, and to add more insight into popular co-words associated with flightshame, semantic network analysis was employed (Xiong et al., 2019). The relationships between words in the flightshame sample were visualised by determining nodes and links. Nodes have different sizes depending on how often they appeared in posts. Connections between words are represented through lines, whereby the thickness of the line shows the strength of the co-occurrence of words. The semantic network was processed in Gephi – an open tool for analysing network structures (<https://gephi.org/>).

Results

Spatio-temporal spread of the flightshame concept

Flygskam appeared for the first time in a Swedish language tweet on 14 July 2016. The second and third tweets were not made until one and a half years later, on 28 November 2017. The fourth post on the 29 November 2017, for the first time, provided some more detail on the meaning of the term by referring to a cartoon originally posted on Facebook by the Swedish Consumer Association (Figure 2).

The first Twitter post containing the English neologism "flightshame" appeared on the 31 August 2018, followed by a second tweet on the 24 November in 2018 containing key elements that underpin the concept: "Could eco-friendly flying be on the horizon? Great article that goes beyond the tech-fix suggested in the title. Introduces the stay grounded #flightshame concept". Flygskam continued to be used more frequently than flightshame (Figure 3). Peaks in the use of "flightshame" typically also reflect flygskam peaks (but not the other way round). Since March 2019, there has been no obvious increase in activity.

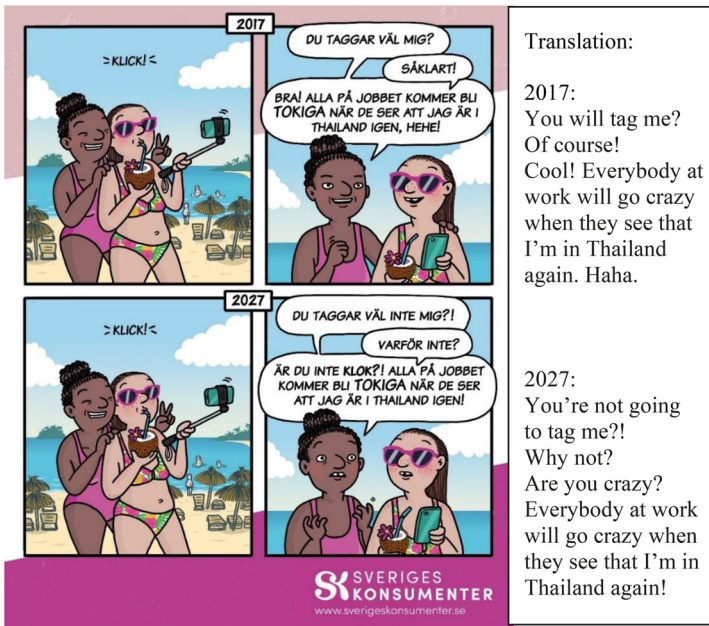


Figure 2. Cartoon posted on Twitter on 29 November 2017, following a public Facebook post by the Swedish Consumer Association (Sveriges Konsumenter).

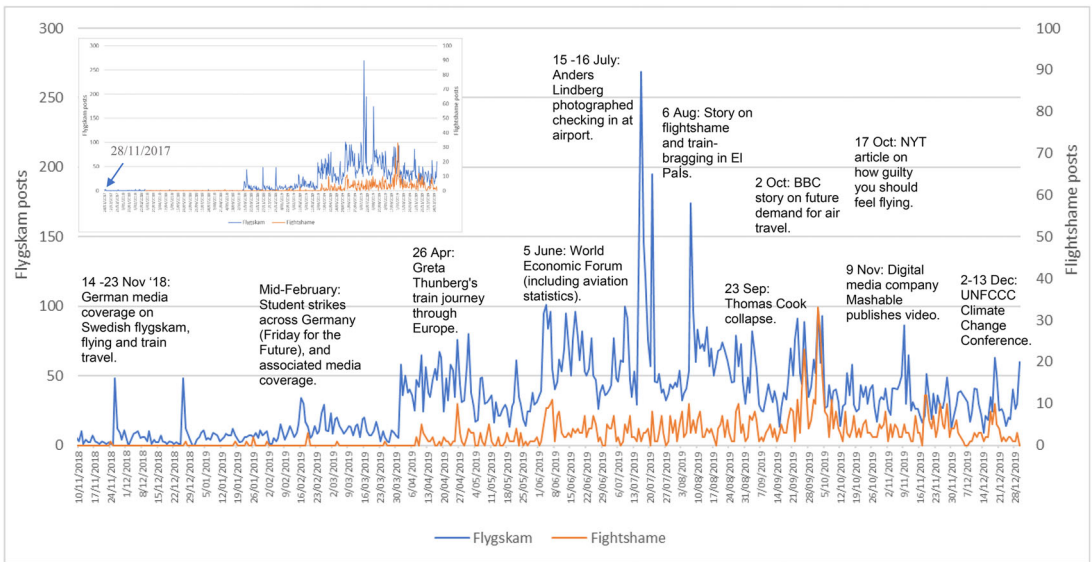


Figure 3. Number of tweets containing “flygskam” (left) and “flightshame” (right) 23 from November 2018 to December 2019. The insert shows the longer timeline starting on the 28 of November 2017.

The volume of flightshame conversations is highly variable, with peaks apparently triggered by media stories that are either retweeted or directly commented on. The flow of media “inputs” and social media “outputs” supports the framework of the communication system visualised in Figure 1. The first peak was a German language cluster that started on the 14 November 2018 when German media discussed “flygskam” and the need to shift travel towards rail. A post from

the 15 November exemplifies the sentiment of users (translated from German): “It has truly become a movement for which a new term has become established: flygskam, to feel ashamed about one’s air travel. There’s a good chance that this could become the word of the year for 2018”. A Spanish cluster appeared in the days after the 6 August 2019 in response to an *El País* story about climate change and flying (with a cover image of dead polar bears in a Spanish city). On the 6th and 7th of August alone, there were 68 Spanish posts containing the word flygskam. Similarly, a peak on the 2 October 2019 reflected interest in a story by the BBC on research that indicated a halving of flights because of people’s negative attitudes towards flying. Perhaps because of the origin of the story (UK), this date saw the single largest daily number of posts with the English word flightshame – also the only day where this number exceeded flygskam posts.

The overall peak of flygskam posts occurred on 15–16 July 2019 ($N=121$ and 269, respectively), when media covered a story of Anders Lindberg, political editor of a Swedish newspaper, taking a leisure flight despite his public stance on climate action. Of all tweets on those two days, 26.5% contained the name Lindberg, painting him as a climate hypocrite. The notion of moral hypocrisy is closely related to perceived “shameful” behaviour, when people fail to act to the (moral) standards they uphold publicly (i.e. an “inconsistency with self”, Bran & Vaidis, 2020, p. 88). The sensitivity towards climate hypocrisy by the elite was evident in other posts that referred to travel by celebrities and politicians. Some perceived that if self-pronounced climate activists are not able to renounce flying then it would be unreasonable to expect it from others.

A second peak occurred between 23 and 27 September 2019 in response to the collapse of the British travel company Thomas Cook (29 posts with flygskam/flightshame). Whilst some tweets indicated empathy, others were cynical and commented on this event being a sign of further airline failures to come. A post from 23 September reads: “Feeling the pain of all those #ThomasCook passengers left stranded or unable to make their long-haul flights to sunny places ... NOT. Instead I’m feeling vindicated for staycationing, and not flying because love this planet. This is flygskam on huge scale”. UN climate events did not attract high Twitter activity. However, the travels of Greta Thunberg, a young Swedish climate activist, were discussed widely, namely in 229 flygskam and 80 flightshame posts (see also Mkono et al., 2020).

The spatial analysis provides insights into how the concept spread from its Swedish origin to a more global phenomenon across three time periods. Figure 4 shows the locations of posters for the period between the first mention of flygskam and the first English version of the word (14 June 2016 to 31 August 2018), followed by the period from 1 September 2018 to 31 March 2019, and finally from 1 April to 31 December 2019. As expected, activity started in Sweden and spread to other Scandinavian and European countries. The interest by Twitter users registered in India is noteworthy. By the end of 2019, the new expression had truly become a global phenomenon, albeit with relatively low numbers in Africa, South America and Asia.

What do flightshame tweets reveal?

In response to the second research question, the content of posts was analysed in more detail. The most frequently used hashtags show that a large majority of posts in both datasets relate to climate change and the articulated need to reduce flying. The occurrence of non-Swedish and non-English language popular hashtags shows the momentum this topic gained in countries such as Germany and France. The flygskam hashtags indicate strong links to social movements such as FlightFree or Staygrounded, and the politics of climate change (see Table 2). In contrast, Twitter posts that include the English word flightshame reflect more general discussions and opinions, rather than political advocacy. Train travel is an important topic featuring in many posts, and whilst not in the top 20, the following hashtags were relatively common: #train ($N=66$), #tagskryt ($N=54$, Swedish for trainbragging), and #trainbrag ($N=10$).



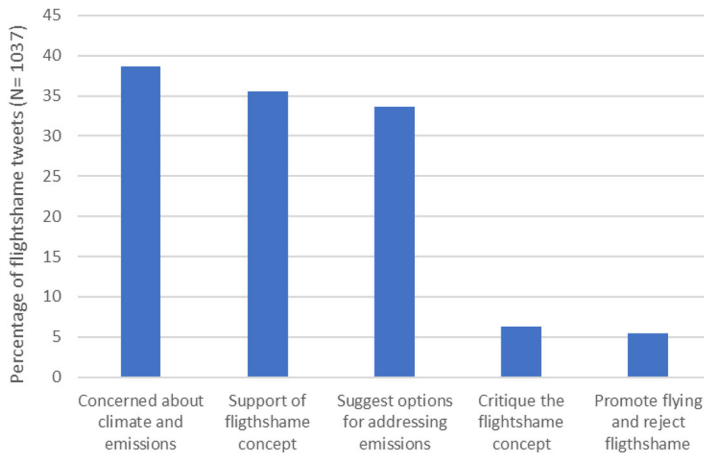
Figure 4. Spread of flygskam and flightshame by origin of Twitter user: (a) before 1 September 2018, (b) 1 September 2018 to 31 March 2019, and (c) after 1 April 2019.

The manual coding of 1037 flightshame tweets revealed that 54% of posts were either showing generic climate concern or explicit support for the concept of flightshame. Of all posts, 20% displayed both concern about the climate and support of flightshame. A pertinent example is a tweet from the 4 September 2019: “Are we about to see radical changes in long haul travel? And what might this mean for destinations like Australia? Can we accept that our pursuit of happiness might be inimical to our survival? #longhaultravel #flightshame”. A small number of posts (6.3%) expressed some disagreement with the concept, and 5.5% of posts openly rejected or ridiculed the notion of feeling ashamed of flying (Figure 5). The different perspectives are explored in more detail below.

Over one-third of posts (35.5%) clearly support the flightshame concept, albeit with varying angles. Tweets reflected personal feelings and experience of shame or guilt, for example, a post on 1 October 2019 reads: “#TrainFame vs #FlightShame: Despite the early hour, I’m looking forward to the next train ride across Germany. In constant effort to reduce carbon footprint...” Others specifically shared their dilemma of feeling flightshame whilst living or working in places

Table 2. Top 20 hashtags within the flygskam and flightshame datasets (in italics explanations where necessary).

Flygskam dataset (hashtags other than #flygskam with <i>N</i> = 1337)	Flightshame dataset (hashtags other than #flightshame with <i>N</i> = 968)
#flygskam (<i>N</i> = 269) <i>German for flightshame</i>	#flygskam (<i>N</i> = 162)
#svpol (<i>N</i> = 264) <i>Swedish politics</i>	#climatechange (<i>N</i> = 86)
#klimat (<i>N</i> = 178) <i>Swedish for climate</i>	#aviation (<i>N</i> = 42)
#flightshame (<i>N</i> = 174)	#travel (<i>N</i> = 38)
#climatechange (<i>N</i> = 172)	#climateemergency (<i>N</i> = 32)
#flygfritt2019 (<i>N</i> = 165) <i>Flight-free movement</i>	#climatecrisis (<i>N</i> = 28)
#boycott (<i>N</i> = 164)	#gretathunberg (<i>N</i> = 28)
#quietskies (<i>N</i> = 161) <i>Campaign against aircraft noise</i>	#flying (<i>N</i> = 26)
#flyless (<i>N</i> = 160) <i>Movement</i>	#carbonfootprint (<i>N</i> = 25)
#flightshaming (<i>N</i> = 122)	#flygskam (<i>N</i> = 23)
#flyingless (<i>N</i> = 106) <i>Movement</i>	#co2 (<i>N</i> = 22)
#climateemergency (<i>N</i> = 104) <i>Oxford Dictionary word of the year 2019</i>	#climateaction (<i>N</i> = 19)
#staygrounded (<i>N</i> = 100) <i>Movement</i>	#stayonthe ground (<i>N</i> = 19)
#avion (<i>N</i> = 90) <i>French for aircraft</i>	#flyless (<i>N</i> = 18)
#aviation (<i>N</i> = 87)	#climatestrike (<i>N</i> = 16)
#co2 (<i>N</i> = 85)	#airline (<i>N</i> = 15)
#gretathunberg (<i>N</i> = 84) <i>Swedish youth climate activist</i>	#climate (<i>N</i> = 15)
#Fridaysforfuture (<i>N</i> = 83) <i>Youth movement</i>	#airlines (<i>N</i> = 14)
#climat (<i>N</i> = 81) <i>French for climate</i>	#environment (<i>N</i> = 14)
#stayonthe ground (<i>N</i> = 81) <i>Movement</i>	#flygskamhttps (<i>N</i> = 14)

**Figure 5.** Content of tweets coded into five broad categories.

that require air travel, for example, “#Flightshame Unfortunately, fly back and forth from Norway to San Francisco twice year for college. However, am avoiding flying anywhere else and will reduce my flights to zero when I’m done with my degree” (30 April 2019). In this tweet, the user communicated intended changes in behaviour to address their adverse feelings. Others did not comment on personal matters but supported climate activism more generally. A post on the 1 May 2019 says: “WOW: #Flygskam goes worldwide. Dear #fridays4future and XR: please make clear that Your critics just want to bring You down with lies. Be the ones who say NO when flight is scheduled for Your holiday trip! #parents4future #FlightShame #LessFlying #”.

Many posts discussed ways of reducing emissions, either directly or indirectly. This is not surprising given that adjusting actions is one way of addressing dissonance. Train travel was referred to most often, including through the use of another neologism, namely “trainbragging” (see above). Other ways to address aviation (or other) emissions were put forward. A number of travel companies appeared to capitalise on the notion of “travel guilt” (Bösehans et al., 2020) to

Table 3. Proposed options for reducing emissions.

Mitigation measures	Example tweet	Date
Train instead of plane ($N = 155$)	"A Users Guide to Sail-Rail with Bicycle and Opportunities on the Dublin-London Route #FlightShame"	6 May 2019
Offsetting ($N = 71$)	"Its dream come true to be here in #NZ. Thanks to @atmosfair can compensate my flight at least little. But #flightshame is real and it will be my last time here in this"	23 January 2019
Changing travel or behaviour ($N = 58$)	"The Swedish word 'Flygskam', which translates to 'flight shame', is driving interest in climate-friendly trains, longer stays, and frequent flier taxes. #earthfriendly #ecofriendly #ecofriendlyliving #ecotips #bethechange #flygskam #flightshame #"	31 May 2019
New technology or fuels ($N = 40$)	"Is Hydrogen The Fuel Of The Future For Climate-Friendly Flying? via @forbes #cleanaviation #flightshame"	11 December 2019
Taxes ($N = 20$)	"#quotas and #flygskam are effective at national level, such as Sweden (8% reduction in passengers due to #flightshame). However, European tax on kerosene will have more of an impact at international level. Which is what is needed..."	11 June 2019
Virtual meetings ($N = 19$)	"FOSDEM in 2020 will be totally virtual due to the climate emergency #fosdem #climatechange #flightshame #"	13 September 2019

offer carbon offsets or supposedly more sustainable travel products. The most common areas for proposed climate mitigation are summarised in [Table 3](#).

Not everyone agreed that shaming people (or oneself) about flying is an effective way of addressing aviation climate impacts. Concern related to creating unhelpful labels or discriminating against people, especially in those countries where there are few alternatives to air travel. Another critique was based on the negative framing of shame that does not motivate change in a positive way. Thirdly, posts referred to travelling elites (see earlier on celebrities) and the inequalities this generates. The following three examples illustrate these different critiques:

- "Another thing that #FlightShame risks to do with you is to categorise people in groups of environmentalists and not real environmentally friendly ones. If you fly you are not in the group. And how do you react when you're not allowed to be in the group? You look for new group" (15 April 2019).
- "To be ashamed is powerful feeling, but negative one. How about planet-love or children-love as motivation instead of #flightshame? Also with sufficient investments, long-distance train rides could become great experience. Like them already" (26 April 2019).
- "For sure minority, but don't think its productive to #flightshame everyone when its small group of business elites and the private sector culture that need to own up to their impact" (19 December 2019).

Finally, a small share of posts rejected flightshame, often using derogatory language and eliciting negative emotions (e.g. "Swedes are complete idiots (apparently). #Flygskam #FlightShame", 10 October 2019). A few tweets seemed to question climate change, for example "#ClimateHoax #PromotingBullshit #FlightShame" (9 June 2019), whereas others simply argued that foregoing flying is not realistic or desirable. An example is a post from 21 December 2019: #flightshame is irresponsible, ignorant and dangerous. An unpopular opinion, but one that requires serious

Discussion

Experiencing negative emotions about flying is not new. An article in *The Economist* in 2015, for example, asked the question “how guilty should you feel about the extra carbon you are causing to be spewed into the atmosphere?” (p. 1). Research undertaken over a decade ago identified cognitive dissonance when a participant in a focus group summed it up: “The unfortunate thing is that we want to see the world, before we finish it up” (Becken, 2007, p. 363). Thus, the *zeitgeist* of experiencing negative feelings about one’s air travel has been building for some time and the appearance of a neologism to express and share these emotions in communication with others is therefore not surprising. The way in which new words such as flightshame are received and processed, however, differs for different social groups who align or oppose the underlying value systems. To understand the potential impact of the flightshame phenomenon, the first research question explored the spatio-temporal spread of the word.

The Swedish word “flygskam” entered social media in July 2016 and was translated into English in August 2018. Both gained substantial traction in 2019. This research drew on Twitter conversations to examine the extent to which these two new words spread over time and space. It also explored the content of relevant Twitter posts to identify key perspectives and “common understanding” amongst social network communities. The temporal analysis highlighted an initial increase in the use of both words, but a longer-term rise was not evident. Instead, the patterns demonstrate high variability, with peaks largely being linked to stories – or inputs into the communication system – published by traditional media outlets. Here, several high-profile newspapers were identified as covering the climate crisis by connecting aviation emissions with the notion of flightshame. The research highlighted the important role of traditional news providers in influencing social media content (Yun et al., 2016) and quantity, as evidenced in daily Twitter volumes.

Understanding spatial spread of the neologism is important, as socio-cultural context shapes not only individual attitudes and representations (Bidjari, 2011), but also aspects of peer groups with whom people affiliate. The geographic observations of flygskam, and then later flightshame, on Twitter follow the expected spread from Sweden to elsewhere in Scandinavia, the UK and Europe and North America. By the end of 2019, the neologisms had been used in Twitter feeds from all continents. The most surprising uptake could be seen in India, where users commented on flygskam even before the English version was established. India has 11.5 million users on Twitter; fewer than the UK, but enough to contribute to global volumes of conversations (Statista, 2020). India has a long and vexed history of environmental movements, dating back to British development projects that deprived local people of resources and led to declines in the natural environment. The last three decades saw a rise in environmental activism, supported by international organisations (Nayak, 2015). This basis might provide fertile ground for discussions about personal environmental responsibility, for example in the context of flying and climate change. It is also possible, however, that flightshame Twitter posts from India were made by Western people living in India (expatriates) or Indians living overseas.

When considering the content of posts, the empirical findings suggest that the majority of conversations indicate climate concern and support the concept of flightshame, either from a personal (e.g. own behaviour) or societal perspective (e.g. Gössling et al., 2020). Both the hashtag and content analyses revealed broad agreement on the role of (aviation) emissions in the climate crisis, and the semantic network revealed considerable use of emotive words. Thus, rather than being evidence of an ideological debate (Ciszek, 2016), the corpus of Twitter posts on flightshame indicated a peer network – or echo chamber (Pearce et al., 2014) – of relatively like-minded people who coordinate each other using common language (see framework in Figure 1). The findings from a hashtag frequency analysis revealed that Twitter posts served to support advocacy, activism and politics, especially in the case of posts that used the word “flygskam”. It is possible that climate campaigners prefer to use the original Swedish word for reasons of

authenticity, but also to explicitly articulate their identification with the peer group of Swedish activists and maybe the Swedish political and economic system more broadly.

The notion of hypocrisy was apparent in several tweets, especially in relation to travelling elites who fail to live up to the standards they publicly advocate. Whilst not the same as shame, hypocrisy refers to a person's way of acting despite knowing better. Both must be seen in the context of relationships to other people and perceived status of self. "Standing in the gaze of another is an essential aspect of the shame experience" (Naso, 2007, p. 115), raising questions whether people would have adverse emotions about flying if this activity was less visible. It is then perhaps not surprising that another neologism is emerging, namely that of "smygflyga", or flying secretly. Flying in secret might be interpreted as a coping strategy to deal with the discomfort that is engendered when the value systems and practices of multiple peer groups that are important to an individual collide.

About 12% of tweets reflected open resistance to the idea of flightshame. Of these, about half expressed apprehension about the negative framing, without rejecting the idea outright of having to reduce air travel; they proposed that a more positive approach might empower people to take climate action. Others resisting flightshame took a much more explicit stance against it, with posts clearly reflecting existing "configurations" or anti-climate change templates with an emphasis on economic development, or a strong personal preference for travel – all of which would cause conflict with the notion of flightshame (Hüther, 2016). The moralising opposition evident in the language used in some opposing posts can be interpreted as a reaction, if not a strategy to defend and legitimate personal rights, privileges or habits in the face of apparently changing moral paradigms (Abrams, 2011). Moral convictions are highly related to the self-conception as well as to the collective identity of personal peer groups (Cocolas et al., 2020; Hornsey, 2008). Acting non-verbally as well as verbally according to common ideas and principles, recreates and re-affirms collective identity (Hogg & Terry, 2000), especially if this form of expression contradicts or even vilifies the behaviour of people with oppositional norms (Mkono et al., 2020; Stein, 2017), such as "flight-shamers".

Whilst some criticised the negative framing around shame, many Twitter posts associated the concept with options for mitigating climate change. Given that the feeling of shame indicates some disconnect between what is desirable and what is happening, a call for action is perhaps expected. More frequent use of the train, instead of air travel, was one of the key suggestions, manifesting in another neologism, namely "trainbragging". Other options, such as carbon offsetting (Becken & MacKey, 2017), taxes and technological innovation were also put forward. The notion of "slower" travel as one example of a different travel philosophy was mentioned in several posts. The sharing of such ideas via social media represents another "signal" for other users that they have to make sense of, as visualised in Figure 1.

The semantic network analysis of the corpus of Twitter text also highlighted a high level of normative language and an interest in new behaviours. The question then arises whether language behaviour will translate into real behaviour. The proposed uptake of virtual meetings and telecommunication, for example, has now received new impetus during the Covid-19 crisis, with some commentators already suggesting that some of these changes will persist beyond the pandemic (Glover & Lewis, 2020). Businesses and other organisations have become accustomed to online meetings, and technology has evolved in response to increase in demand. Given that operational budgets are likely to be tight after the coronavirus crisis and climate change concerns will continue (Pearson et al., 2020), the demand for air travel for non-leisure purposes may well decline. As a result, it is conceivable that the constraints imposed by the current health crisis provide impetus for those who have been advocating for similar changes (e.g. reducing number of flights) for reasons of protecting the climate and, maybe, alleviating feelings of shame. A strategic alliance between previously unlikely peer groups may develop; shaped around a common discourse around "no fly".

Changes in behaviour occur when moral concerns of peer groups align (e.g. no-fly and Friday-for-Future movement), as this increases the influence on public opinion (Gössling et al., 2020). As noted by Higham et al. (2016), such shifts would be more likely to occur in countries where trust in government is high and people have elevated moral concerns. Changes in behavioural norms can also be catalysed by enabling policy implementation; something that was suggested in several Twitter posts. Sweden might be a country that combines these factors in a reinforcing way and the origin of flygskam might therefore not be surprising. In Austria, the new coalition of the Conservative with the Green Party seemed to indicate such a new moral position, e.g. as seen in the announcement of “greening” the tax system, including steps to reduce the fiscal privileges of air carriers (Friedl, 2020b).

However, whilst shame or guilt might be internalised and aligned with other grass-root shifts in perspectives and language behaviour, there are systemic barriers that might prevent fundamental change (Becken, 2019). Widespread change will not materialise as long as an important majority believes in the paradigm of the “right of travel”, promoted by institutions like the European Union, the UNWTO or the WTTC (Bianchi & Stephenson, 2013). A substantial part of the existing social system, including tourism businesses, airlines or industry organisations, make their living from fossil fuel-based activities. Attempts to change the current system are mobilised against, for example by highlighting the benefits of flying, by discrediting new messages, or undermining the messenger (Mkono et al., 2020). Ironically, the peer group identified through Twitter users who employ the word flightshame also display high levels of global connectedness (as a virtual network) that reflects common values like concern about the state of the planet, but that does not require physical (carbon-intensive) presence. As such it undermines and presents an antithesis to the physical mobility paradigm advocated by the global travel industry. Whilst too early to say, Covid-19 might lead to a fundamental change in economic conditions and a reduction in air travel capacity as well as demand. These economic triggers are likely to be more effective than any morally motivated media campaign could be; although a “moral” stamp might be applied simultaneously or in retrospect.

Twitter users are only a subgroup of the population and may not fully reflect the wider discourse or changing representations of air travel. Further work is required to observe long-term changes in both language and travel behaviour – in response to likely ongoing impacts of climate change on people’s lives.

Conclusion

This paper presented the findings of analysis of the spread and content of the flightshame concept evident in 15,249 Twitter posts since the first evidence of the neologism “flygskam” in July 2016. The analysis reveals global interest in the climate impacts of air travel, but the volumes remain small and indicate relatively like-minded exchanges, rather than an ideological battle between opposing groups. Mainstream media appeared to exert a strong influence on timing and topics of social media discussions, including stories about “hypocritical” behaviours of self-declared climate activist who were found out to be flying. The analysis revealed use of emotive language and suggestions for more positive framing, but also practical recommendations for reducing climate impacts. Using alternative forms of transport such as trains emerged as a key theme, one that has been associated with another neologism, namely “trainbragging”. Whilst changes in language behaviour represent a reflection of societal trends or shifts, it is too early to say whether social norms are truly changing and whether expressions of shame or guilt translate into tangible new behaviours.

The modern global tourism system is still dominated by important political and economic players who have a vital interest in continuing to promote air traffic as an indispensable condition of economic development, peace and happiness, while banalising the crucial consequences

of climate-warming emissions of aircrafts. The analysis revealed that the defenders of the existing system were not very visible in the Twitter posts filtered for flygskam and flightshame, perhaps because they do not see sufficient threat in the current quantity and nature of the flightshame debate, or because the neologisms do not resonate with their communication needs. New economic realities of air travel due to the coronavirus crisis could (inadvertently) align with negative feelings about climate change and flying, and the combination of both factors could result in more profound change than a (marginal) social movement in itself could have achieved pre-Covid-19.

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No potential conflict of interest was reported by the authors.

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References

- Abrams, D. (2011). Extremism is normal: The roles of deviance and uncertainty in shaping groups and society. In M. A. Hogg & D. L. Blaylock (Eds.), *Extremism and the psychology of uncertainty* (pp. 36–54). Wiley-Blackwell.
- Bastos, M., Piccardi, C., Levy, M., McRoberts, N., & Lubell, M. (2018). Core-periphery or decentralized? Topological shifts of specialized information on Twitter. *Social Networks*, 52, 282–293. <https://doi.org/10.1016/j.socnet.2017.09.006>
- Becken, S. (2007). Tourists' perception of international air travel's impact on the global climate and potential climate change policies. *Journal of Sustainable Tourism*, 15(4), 351–368. <https://doi.org/10.2167/jost710.0>

- Becken, S. (2019). Decarbonising tourism: Mission impossible? *Tourism Recreation Research*, 44(4), 419–433. <https://doi.org/10.1080/02508281.2019.1598042>
- Becken, S., & MacKey, B. (2017). What role for offsetting aviation greenhouse gas emissions in a deep-cut carbon world? *Journal of Air Transport Management*, 63, 71–83. <https://doi.org/10.1016/j.jairtraman.2017.05.009>
- Becken, S., & Pant, P. (2019). *Airline initiatives to reduce climate impact. Ways to accelerate action*. Amadeus, Madrid. <https://amadeus.com/en/insights/white-paper/airline-initiatives-to-reduce-climate-impact>
- Behera, B., & Mishra, P. (2013). The burgeoning usage of neologisms in contemporary English. *Journal of Humanities and Social Science*, 18(3), 25–35.
- Bertalanffy, L. (1968). General system theory. George Braziller.
- Bianchi, R. V., & Stephenson, M. L. (2013). Deciphering tourism and citizenship in a globalized world. *Tourism Management*, 39, 10–20. <https://doi.org/10.1016/j.tourman.2013.03.006>
- Bidjari, A. F. (2011). Attitude and social representation. *Procedia - Social and Behavioral Sciences*, 30, 1593–1597. <https://doi.org/10.1016/j.sbspro.2011.10.309>
- Blondel, V. D., Guillaume, J. L., Lambiotte, R., & Lefebvre, E. (2008). Fast unfolding of communities in large networks. *Journal of Statistical Mechanics: Theory and Experiment*, (10). <https://doi.org/10.1088/1742-5468/2008/10/P10008>
- Bösehans, G., Bolderdijk, W. J., & Wan, J. (2020). Pay more, fly more? Examining the potential guilt-reducing and flight-encouraging effect of an integrated carbon offset. *Journal of Environmental Psychology*, 71, 101469. <https://doi.org/10.1016/j.jenvp.2020.101469>
- Boykoff, M., & Pearman, O. (2019). Now or never: How media coverage of the IPCC special report on 1.5 °C shaped climate-action deadlines. *One Earth*, 1(3), 285–288. <https://doi.org/10.1016/j.oneear.2019.10.026>
- Bran, A., & Vaidis, D. C. (2020). On the characteristics of the cognitive dissonance state: Exploration within the pleasure arousal dominance model. *Psychologica Belgica*, 60(1), 86–102. <https://doi.org/10.5334/pb.517>
- Byrnes, J. P. (2008). Piaget's cognitive-developmental theory. In J. Benson & M. M. Haith (Eds.), *Encyclopaedia of infant and early childhood development* (pp. 543–555). Elsevier.
- Ciszek, E. L. (2016). Digital activism: How social media and dissensus inform theory and practice. *Public Relations Review*, 42(2), 314–321. <https://doi.org/10.1016/j.pubrev.2016.02.002>
- Cocolas, N., Walters, G., Ruhanen, L., & Higham, J. (2020). Air travel attitude functions. *Journal of Sustainable Tourism*, 28(2), 319–336. <https://doi.org/10.1080/09669582.2019.1671851>
- Cohen, S. A., & Higham, J. E. S. (2011). Eyes wide shut? UK consumer perceptions on aviation climate impacts and travel decisions to New Zealand. *Current Issues in Tourism*, 14(4), 323–335. <https://doi.org/10.1080/13683501003653387>
- Drieger, P. (2013). Semantic network analysis as a method for visual text analytics. *Procedia - Social and Behavioral Sciences*, 79, 4–17. <https://doi.org/10.1016/j.sbspro.2013.05.053>
- Durkee, P. K., Lukaszewski, A. W., & Buss, D. M. (2019). Pride and shame: Key components of a culturally universal status management system. *Evolution and Human Behavior*, 40(5), 470–478. <https://doi.org/10.1016/j.evolhumbehav.2019.06.004>
- Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utraiainen, K., & Kyngäs, H. (2014). Qualitative content analysis: A focus on trustworthiness. *SAGE Open*, 4(1), 215824401452263. <https://doi.org/10.1177/2158244014522633>
- Erz, A., Marder, B., & Osadchaya, E. (2018). Hashtags: Motivational drivers, their use, and differences between influencers and followers. *Computers in Human Behavior*, 89, 48–60. <https://doi.org/10.1016/j.chb.2018.07.030>
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford University Press.
- Friedl, H. A. (2015). Communication. In C. Cater, B. Garrod, & T. Low (Eds.), *The encyclopedia of sustainable tourism* (pp. 112–113). CABI.
- Friedl, H. A. (2020a). *Pandemics – Threat or even indispensable for Sustainable Tourism? A systemic Approach to re-conceptualize the Meaning of the “Corona Virus” for the resilience of the global tourism system* [Paper presentation]. Proceedings of the 2nd TOURIST Conference on Sustainable Tourism: Shaping a Better Future – TOURIST 2020, Bangkok, Thailand, July 21–22.
- Friedl, H. A. (2020b). Was bedeutet das neue Regierungsprogramm für den Österreichischen Tourismus. *Tourismus Wissen Quarterly*, 20, 158–160.
- Glover, A., & Lewis, T. (2020, March 27). New ways of ‘being together apart’ can work for us and the planet long after coronavirus crisis passes. *The Conversation*. Retrieved May 14, 2020, from <https://theconversation.com/new-ways-of-being-together-apart-can-work-for-us-and-the-planet-long-after-coronavirus-crisis-passes-133348>
- Gössling, S., Hanna, P., Higham, J., Cohen, S., & Hopkins, D. (2019). Can we fly less? Evaluating the ‘necessity’ of air travel. *Journal of Air Transport Management*, 81, 101722. <https://doi.org/10.1016/j.jairtraman.2019.101722>
- Gössling, S., Humpe, A., & Bausch, T. (2020). Does ‘flight shame’ affect social norms? Changing perspectives on the desirability of air travel in Germany. *Journal of Cleaner Production*, 266, 122015. <https://doi.org/10.1016/j.jclepro.2020.122015>
- Hansen, D. L., Shneiderman, B., Smith, M. A., & Himelboim, I. (2020). Semantic networks. In K. Morgan, M. Burlington (Eds.), *Analyzing social media networks with NodeXL* (pp. 115–125).

- Higham, J. E. S., & Cohen, S. A. (2011). Canary in the coalmine: Norwegian attitudes towards climate change and extreme long-haul air travel to Aotearoa/New Zealand. *Tourism Management*, 32 (1), 98–105. <https://doi.org/10.1016/j.tourman.2010.04.005>
- Higham, J., Cohen, S. A., Cavaliere, C. T., Reis, A., & Finkler, W. (2016). Climate change, tourist air travel and radical emissions reduction. *Journal of Cleaner Production*, 111, 336–347. <https://doi.org/10.1016/j.jclepro.2014.10.100>
- Hogg, M. A., & Terry, D. I. (2000). Social identity and self-categorization processes in organizational contexts. *Academy of Management Review*, 25(1), 121–140. [Database] <https://doi.org/10.5465/amr.2000.2791606>
- Hornsey, M. J. (2008). Social identity theory and self-categorization theory: A historical review. *Social and Personality Psychology Compass*, 2(1), 204–222. <https://doi.org/10.1111/j.1751-9004.2007.00066.x>
- Hosseini, H. (1997). Cognitive dissonance as a means of explaining economics of irrationality and uncertainty. *The Journal of Socio-Economics*, 26(2), 181–189. [https://doi.org/10.1016/S1053-5357\(97\)90032-9](https://doi.org/10.1016/S1053-5357(97)90032-9)
- Hüther, G. (2016). *Biologie der Angst. Wie aus Streß Gefühle werden* (13th ed.). Vandenhoeck und Ruprecht.
- IPCC. (2018). *Global warming of 15°C summary for policymakers*. Retrieved November 14, 2018, from http://reportipccch/sr15/pdf/sr15_spm_finalpdf
- Kantenbacher, J., Hanna, P., Miller, G., Scarles, C., & Yang, J. (2019). Consumer priorities: What would people sacrifice in order to fly on holidays? *Journal of Sustainable Tourism*, 27(2), 207–222. <https://doi.org/10.1080/09669582.2017.1409230>
- Kirilenko, A. P., & Stepchenkova, S. O. (2014). Public microblogging on climate change: One year of Twitter worldwide. *Global Environmental Change*, 26, 171–182. <https://doi.org/10.1016/j.gloenvcha.2014.02.008>
- Krauss, R. M., & Chiu, C. (1998). Language and social behavior. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (4th ed., Vol. 2, pp. 41–88). McGraw-Hill.
- Mkono, M., Hughes, K., & Echentille, S. (2020). Hero or villain? Responses to Greta Thunberg's activism and the implications for travel and tourism. *Journal of Sustainable Tourism*, 28(12), 2081–2098. <https://doi.org/10.1080/09669582.2020.1789157>
- Naso, R. C. (2007). Beneath the mask: Hypocrisy and the pathology of shame. *Psychoanalytic Psychology*, 24(1), 113–125. <https://doi.org/10.1037/0736-9735.24.1.113>
- Nayak, A. K. (2015). Environmental movements in India. *Journal of Developing Societies*, 31(2), 249–280. <https://doi.org/10.1177/0169796X15576172>
- Onwezen, M. C., Antonides, G., & Bartels, J. (2013). The Norm Activation Model: An exploration of the functions of anticipated pride and guilt in pro-environmental behaviour. *Journal of Economic Psychology*, 39, 141–153. <https://doi.org/10.1016/j.joep.2013.07.005>
- Pearce, W., Holmberg, K., Hellsten, I., & Nerlich, B. (2014). Climate change on Twitter: Topics, communities and conversations about the 2013 IPCC working group 1 report. *PLoS One*, 9(4), e94785. <https://doi.org/10.1371/journal.pone.0094785>
- Pearson, R. M., Sievers, M., McClure, E. C., Turschwell, M. P., & Connolly, R. M. (2020). Covid-19 recovery can benefit biodiversity. *Science*, 368(6493), 838–839. <https://doi.org/10.1126/science.abc1430>
- Rice, D. (2019). 'Climate emergency' is Oxford Dictionary's word of the year. *USA Today*. Retrieved August 21, 2020, from <https://www.usatoday.com/story/news/nation/2019/11/21/climate-emergency-oxford-dictionary-word-year/4263945002/>
- Robertson, T., Szyner, D., Delton, A., Tooby, J., & Cosmides, L. (2018). The true trigger of shame: Social devaluation is sufficient, wrongdoing is unnecessary. *Evolution and Human Behavior*, 39(5), 566–573. <https://doi.org/10.1016/j.evolhumbehav.2018.05.010>
- Roxburgh, N., Guan, D., Shin, K. J., Rand, W., Managi, S., Lovelace, R., & Meng, J. (2019). Characterising climate change discourse on social media during extreme weather events. *Global Environmental Change*, 54, 50–60. <https://doi.org/10.1016/j.gloenvcha.2018.11.004>
- Sheller, M. (2017). From spatial turn to mobilities turn. *Current Sociology*, 65(4), 623–639. <https://doi.org/10.1177/0011392117697463>
- Spencer, J. (2019). Guardian joins major global news collaboration Covering Climate Now. *The Guardian*, Environment. Retrieved December 20, 2019, from <https://www.theguardian.com/environment/2019/sep/15/guardian-leads-global-news-collaboration-covering-climate-now>
- Statista. (2020). *Monthly Twitter users*. Retrieved December 20, 2019, from <https://www.statista.com/statistics/282087/number-of-monthly-active-twitter-users/>
- Steffen, W., Rockström, J., Richardson, K., Lenton, T. M., Folke, C., Liverman, D., Summerhayes, C. P., Barnosky, A. D., Cornell, S. E., Crucifix, M., Donges, J. F., Fetzer, I., Lade, S. J., Scheffer, M., Winkelmann, R., & Schellnhuber, H. J. (2018). Trajectories of the earth system in the Anthropocene. *Proceedings of the National Academy of Sciences of the United States of America*, 115(33), 8252–8259. <https://doi.org/10.1073/pnas.1810141115>
- Stein, R. (2017). "Trumping" conformity: Urges towards conformity to ingroups and nonconformity to morally opposed outgroups. *Journal of Experimental Social Psychology*, 70, 34–40. <https://doi.org/10.1016/j.jesp.2016.12.007>

- Stockholm Resilience Centre. (2019). *Planet at risk of heading towards "Hothouse Earth" state*. Retrieved June 9, 2019, from <http://www.stockholmresilience.org/research/research-news/2018-08-06-planet-at-risk-of-heading-towards-hothouse-earth-state.html>
- Taylor, M., & Murray, J. (2020, February 10). 'Overwhelming and terrifying': The rise of climate anxiety. *The Guardian*. Retrieved June 20, 2020, from <https://www.theguardian.com/environment/2020/feb/10/overwhelming-and-terrifying-impact-of-climate-crisis-on-mental-health>
- Teroni, F., & Deonna, J. A. (2008). Differentiating shame from guilt. *Consciousness and Cognition*, 17(3), 725–740. <https://doi.org/10.1016/j.concog.2008.02.002>
- The Club of Rome. (2018). *The Club of Rome Climate Emergency Plan. A Collaborative Call for Climate Action*. Retrieved January 5, 2019, from https://www.clubofrome.org/wp-content/uploads/2018/12/COR_Climate-Emergency-Plan-final-pagespdf
- The Economist*. (2015, December 7). Is flying getting better or worse for the environment? *Business Travel*. Retrieved December 20, 2019, from <https://www.economist.com/gulliver/2015/12/07/is-flying-getting-better-or-worse-for-the-environment>
- Tichon, J. G. (2015). Exploring how children express feelings and emotions in an online support group. *Computers in Human Behavior*, 53, 469–474. <https://doi.org/10.1016/j.chb.2015.07.013>
- Weber, E. U. (2016). What shapes perceptions of climate change? *Wiley Interdisciplinary Reviews: Climate Change*, 7(1), 125–134. <https://doi.org/10.1002/wcc.377>
- Whitmarsh, L. (2011). Scepticism and uncertainty about climate change: Dimensions, determinants and change over time. *Global Environmental Change*, 21(2), 690–700. <https://doi.org/10.1016/j.gloenvcha.2011.01.016>
- Worsøe, L. B. (2011). What's in a word – What's a word in? *Language Sciences*, 33(4), 603–613. <https://doi.org/10.1016/j.langsci.2011.04.033>
- Xiong, Y., Cho, M., & Boatwright, B. (2019). Hashtag activism and message frames among social movement organizations: Semantic network analysis and thematic analysis of Twitter during the #MeToo movement. *Public Relations Review*, 45(1), 10–23.
- Young, M., Markham, F., Reis, A. C., & Higham, J. E. S. (2015). Flights of fantasy: A reformulation of the flyers' dilemma. *Annals of Tourism Research*, 54, 1–15. <https://doi.org/10.1016/j.annals.2015.05.015>
- Yun, G. W., Morin, D., Park, S., Joa, C. Y., Labbe, B., Lim, J., Lee, S., & Hyun, D. (2016). Social media and flu: Media Twitter accounts as agenda setters. *International Journal of Medical Informatics*, 91, 67–73. <https://doi.org/10.1016/j.ijmedinf.2016.04.009>