flyingless

Survey FlyingLess 2022
Detailed report of the aggregated survey results on the topic of flight reduction in academia

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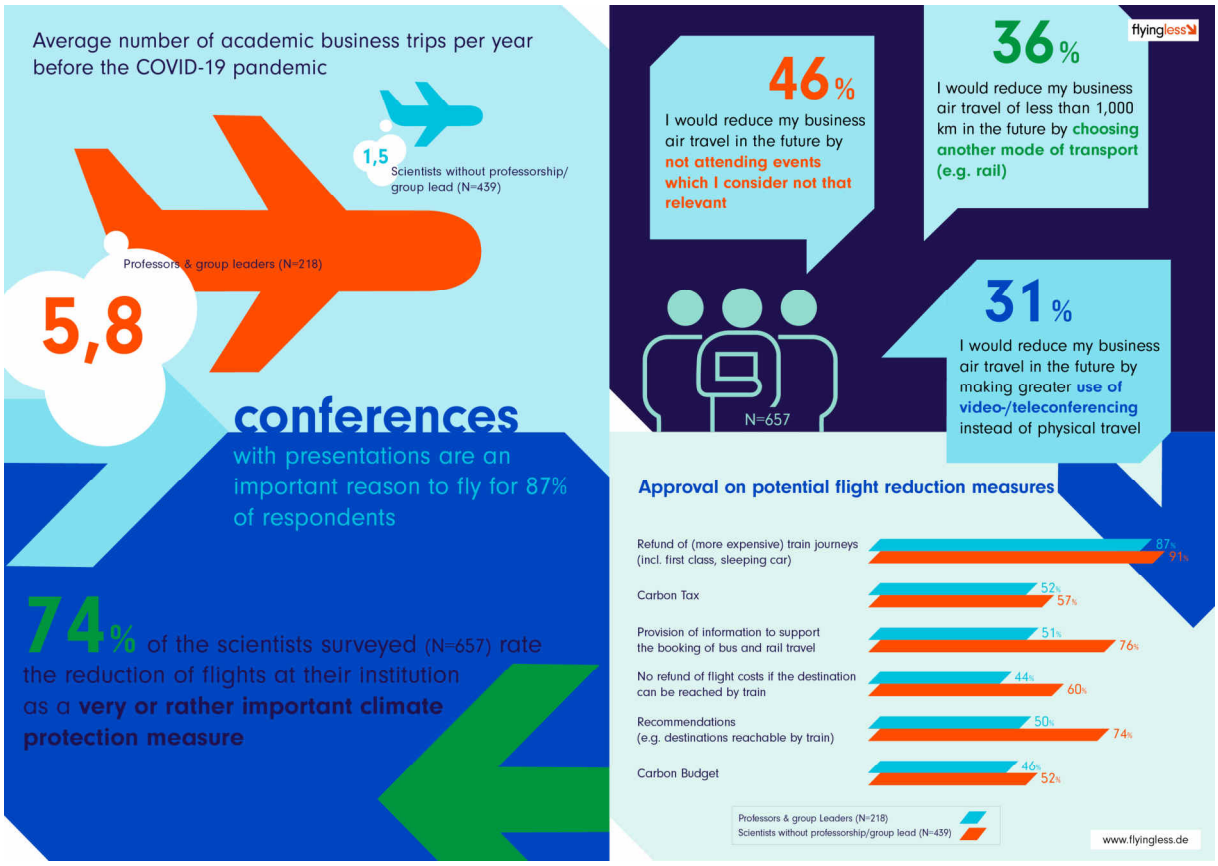
NATIONALE KLIMASCHUTZ INITIATIVE

Graphical abstract of the 2022 FlyingLess survey on air travel at eight academic institutions in Germany



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1. About FlyingLess

With the internationalization of science and research, air travel by university staff has also increased - scientists are among the frequent flyers.

The goal of the FlyingLess project is to support universities and research organizations in reducing flight emissions, which accounts for a significant share of their total greenhouse gas emissions. FlyingLess develops approaches to reduce air travel in academia that are implemented at different levels (research, teaching and administration). Successful reduction of flight emissions requires broad participation and support, both from the management level and from staff and students. The project is carried out in close collaboration with four partners as well as further academic institutions collaborating with the project as so called «satellites». FlyingLess is led by Dr. Susann Görlinger at the ifeu Institute Heidelberg in close collaboration with Dr. Nicole Aeschbach, TdLab Geography, Heidelberg University. The project is funded over 3 years (October 2021– September 2024) by the National Climate Initiative (NKI) of the German Federal Ministry for Economic Affairs and Climate Action.

2. Methodological Approach

To get an understanding of the challenges and opportunities of air travel reduction at academic institutions, an online survey was conducted in 2022 by Caroline Merrem, together with S. Görlinger and N. Aeschbach. Scientists and students of the four FlyingLess partner institutions (two universities and two research institutions) and four other higher education institutions (FlyingLess satellites), participated. The quantitative survey of professors & group leaders, scientists without professorships/group lead, and students provides information about the opinions and behavioural patterns regarding academic air travel. The collected data serves as a reference and basis for developing further approaches to reduce air travel at the respective institutions. The open source tool LimeSurvey was used to conduct the online survey.

The status groups of the survey were divided into:

Survey A

- Scientists
  - Professors & group leaders
  - Scientists without professorship/group lead (incl. PhD students)

Survey B

- Students (Bachelor's/Master's degree or similar)

Since the mobility behavior of PhD students is closer to that of scientific staff than of bachelor or master students, they were asked the same questions as scientists.

3. Response rate of the survey

The raw data were cleaned and led to a sample size of 657 scientists at eight scientific institutions - of which 218 were professors & group leaders and 439 scientists without professorship/group lead - as well as of 525 students from six different higher education institutes.

Since not every institution could provide exact and up to date numbers about the institutional members in the targeted status groups, the response rates are rough estimates: 17 % for professors and group leaders, 7 % for scientists without professorship/group lead and about 1 % for students.

4. Limitations

To assess the significance of the survey results, the following limitations need to be taken into account: Even though different types of academic institutions were included in the survey, not all disciplines could be covered. At some institutes, there may have been committed members who promoted the survey within their department. Furthermore, the student response rate was quite low, which questions the results' significance. It also needs to be considered that the survey links had no individual key restriction, hence we cannot exclude the possibility that the survey was answered more than once by the same person.

5. Structure of the report

Chapter 6 shows the aggregated results for the scientists across all participating institutions. Chapter 7 compares the results for the status groups of professors and group leaders as well as scientists without professorships/group lead. Subsequently, in chapter 8, the survey results of the students are presented, which are based on different questions than those for the status group of scientists.

6. Results of scientists (N = 657)

In this chapter, the results of the scientists are presented in an aggregated form. The status group consists of the survey results from professors and group leaders (N=218) and scientists without professorship or group leadership (N=439).

6.1. Structuring the respondent group

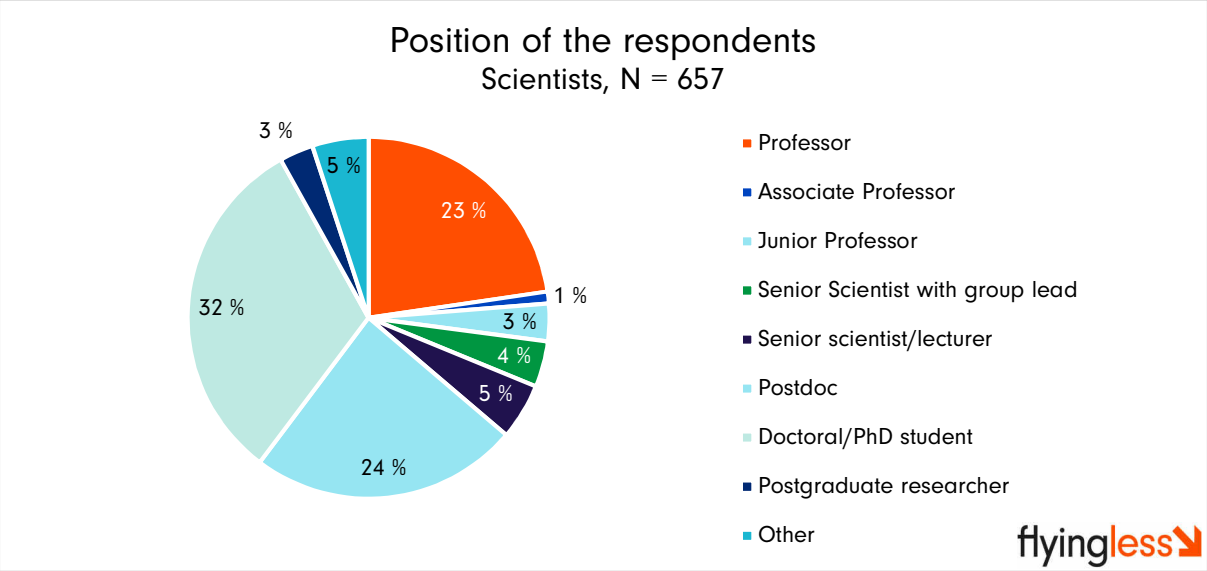

Figure 1: Position of the respondents. Scientists, N = 657. Relative frequency of mentions of different positions.

6.2. Average mobility (flight/train/bus) and use of virtual format per year prior to the COVID-19 pandemic

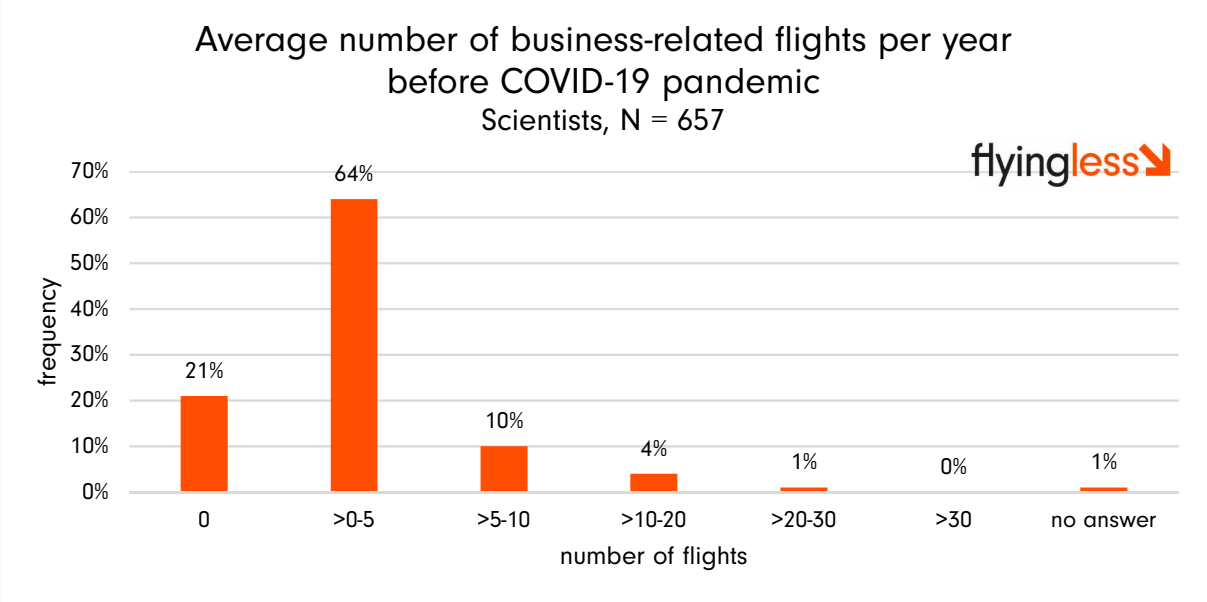

Figure 2: Average number of business-related flights per year before COVID-19 pandemic (respondents' estimate). Relative frequency of mentions (Y-axis) per aggregated number of air travels per year (X-axis). Aggregated status group, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439).

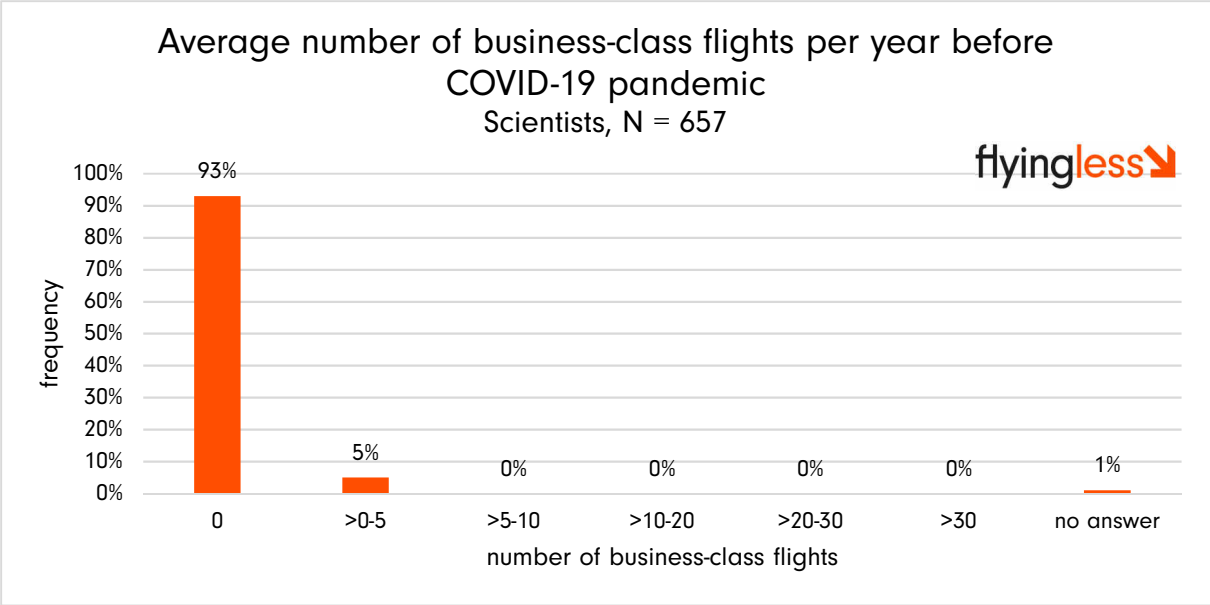

Figure 3: Average number of business-class flights per year before COVID-19 pandemic (respondents' estimate). Relative frequency of mentions (Y-axis) per number of business-class flights per year (X-axis). Aggregated status group, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439).

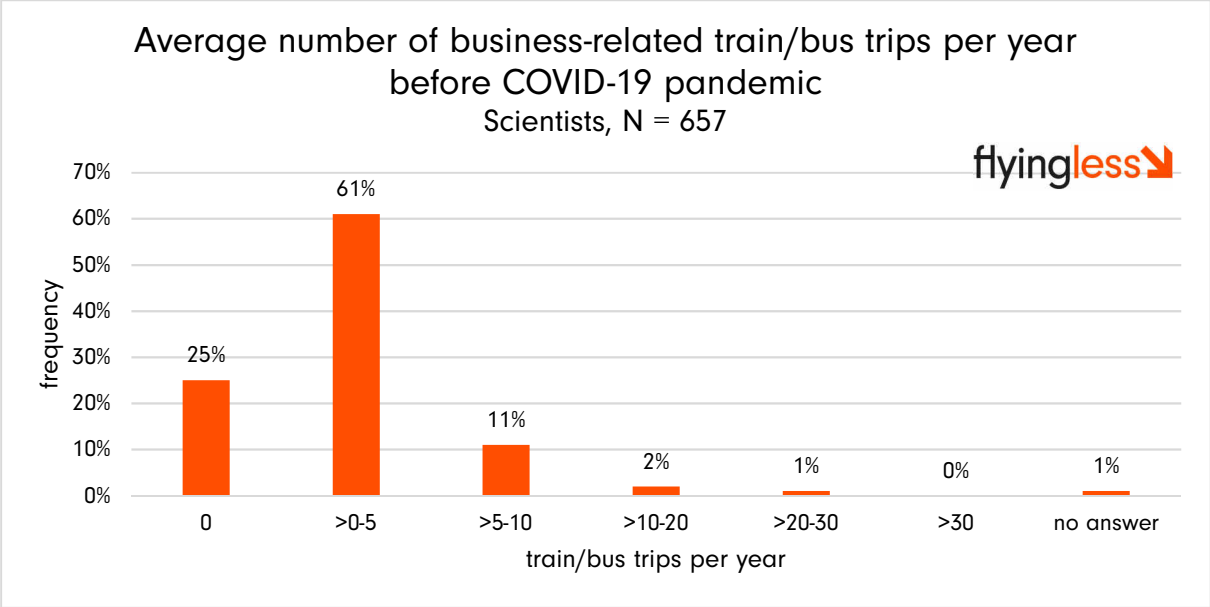

Figure 4: Average number of business-related train/bus trips of 6 h or more per year before COVID-19 pandemic (respondents' estimate). Relative frequency of mentions (Y-axis) per number of train/bus trips per year (X-axis). Aggregated status group, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439).

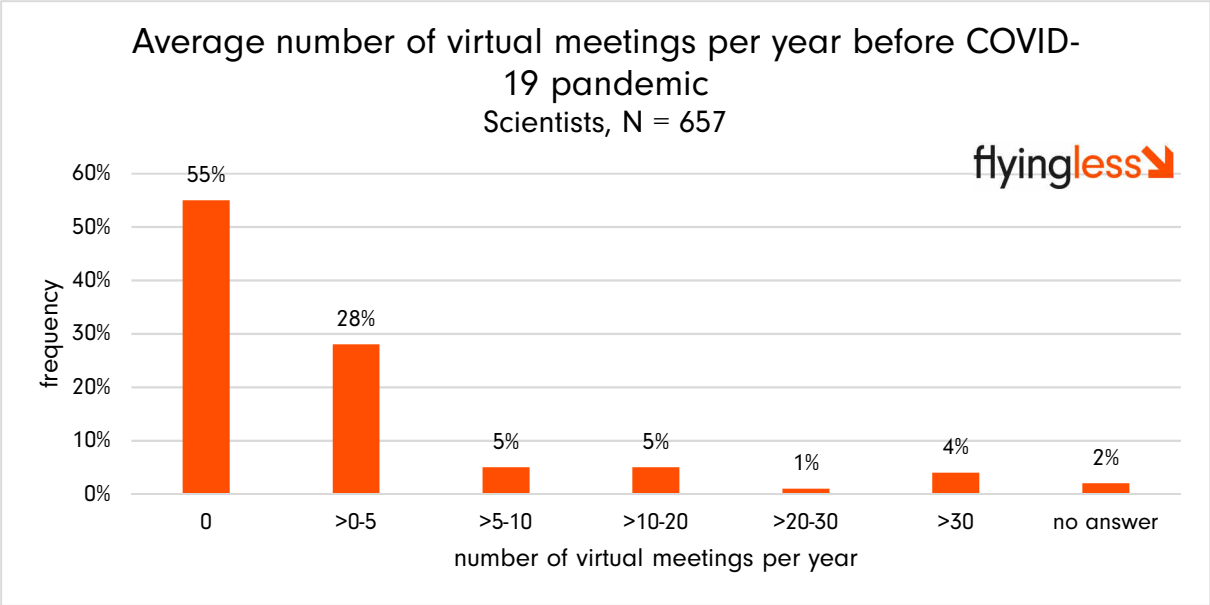

Figure 5: Average number of virtual meetings per year before COVID-19 pandemic (estimation of respondents). Relative frequency of mentions (Y-axis) per number of virtual events/meetings per year (X-axis). Aggregated status groups, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439).

6.3. Relevance of different reasons for business air travel

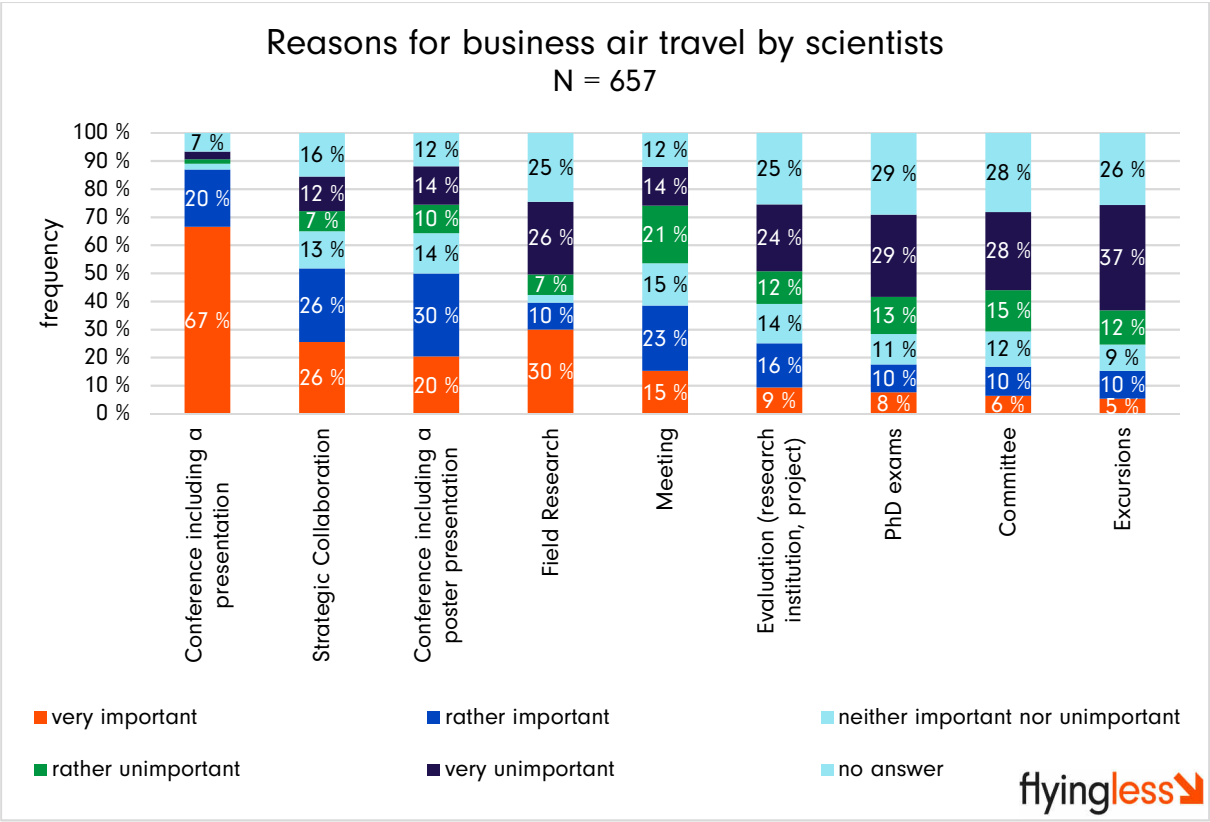

Figure 6: Reasons for business air travel by scientists. Aggregated status group, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439). Relative frequency of mentions (Y-axis) per sub-answer (reason for a business trip in the academic field; X-axis).

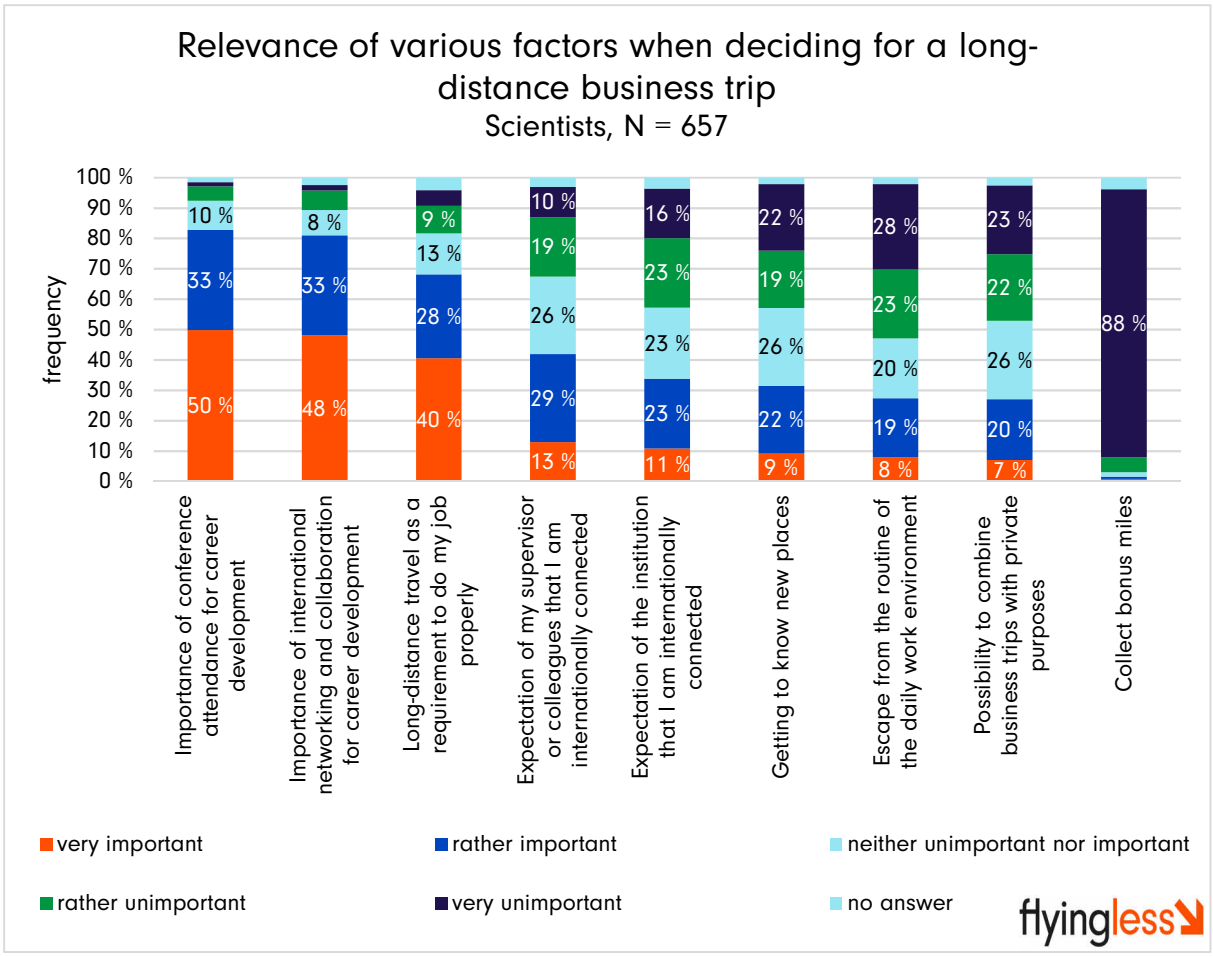

Figure 7: Relevance of various factors in weighing a long-distance business trip. Aggregated status group, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439). Relative frequency of mentions (Y-axis) per sub-answer (decision factor in carrying out travel booking; X-axis).

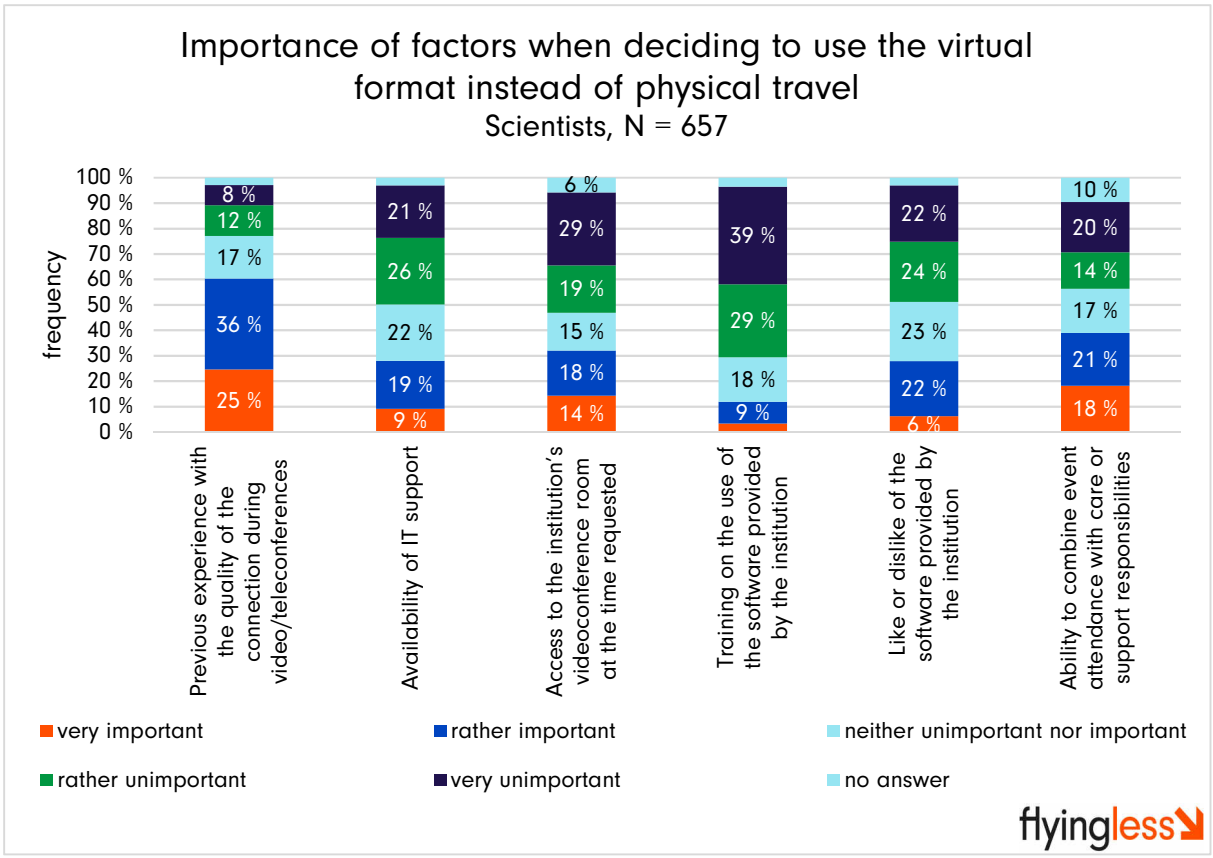

Figure 8: Importance of when deciding to use the virtual format instead of physical travel. Aggregated status group, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439). Relative frequency of mentions (Y-axis) per sub-answer (decision factor for weighting up participation in a virtual event; X-axis).

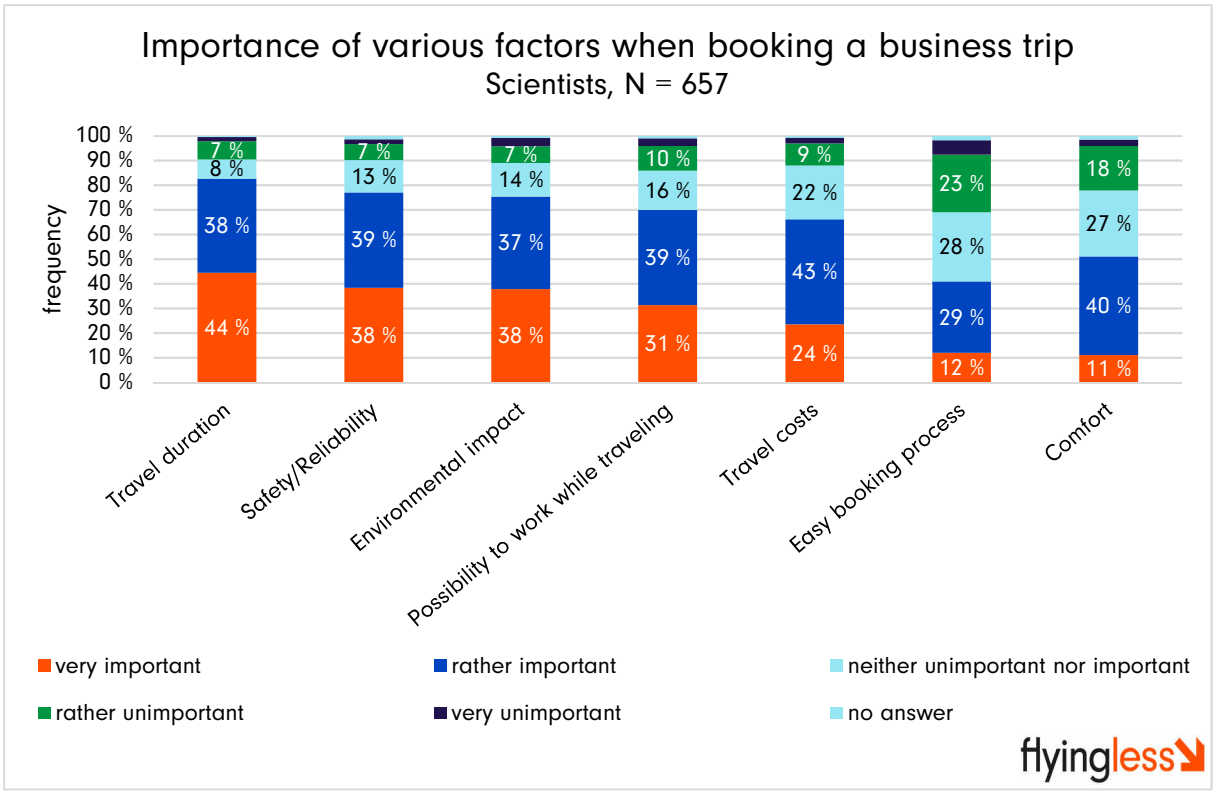

Figure 9: Importance of various factors when booking a business trip. Aggregated status group, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439). Relative frequency of mentions (Y-axis) per sub-answer (factor to consider a business trip in the academic field; X-axis).

6.4. Behaviour changes and measures

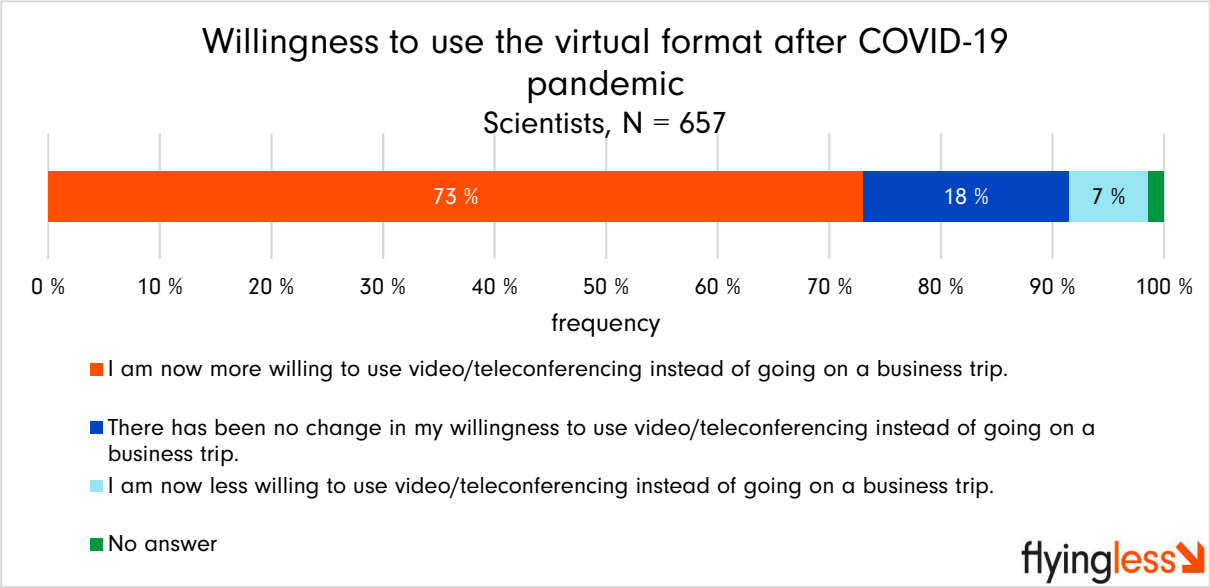

Figure 10: Willingness to use the virtual format after COVID-19 pandemic. Aggregated status group, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439). Relative frequency of mentions.

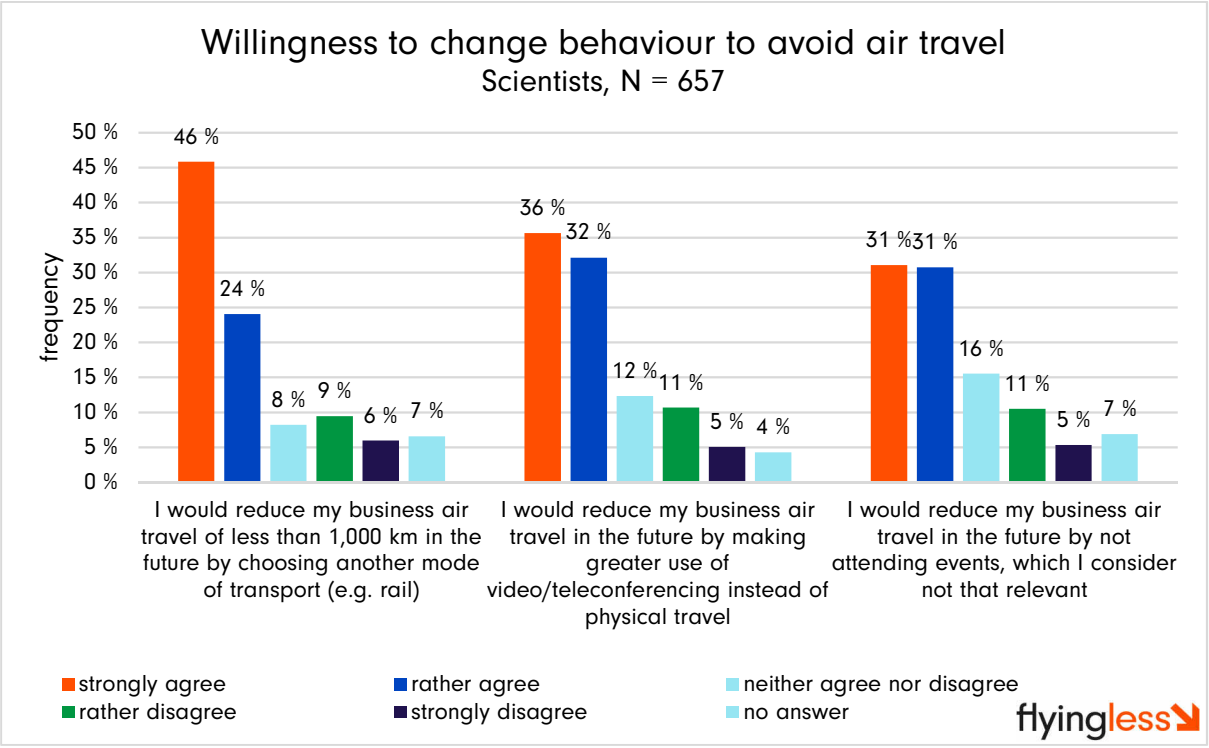

Figure 11: Willingness to change behaviour to avoid air travel. Aggregated status group, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439). Relative frequency of mentions (Y-axis) per sub-answer (agreement with statements about future mobility behaviour to avoid official air travel; X-axis).

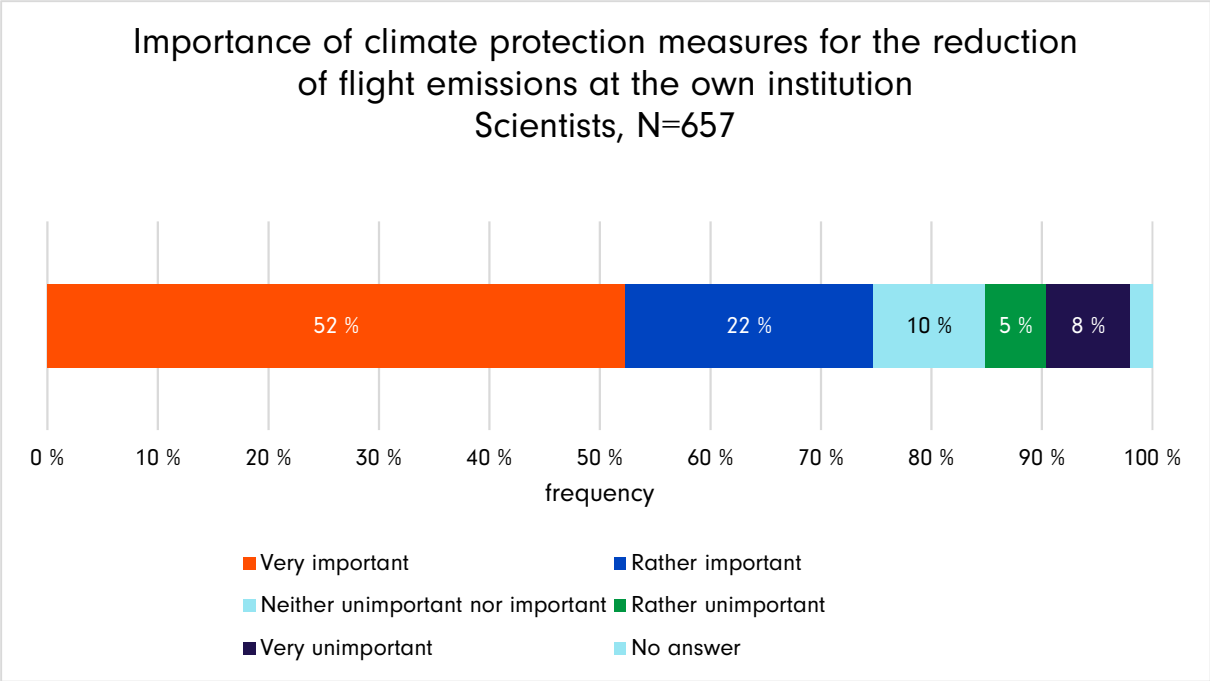

Figure 12: Importance of climate protection measures for the reduction of flight emissions at the own institution. Relative frequency of mentions (X-axis) of aggregated status group, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439 (Y-axis)).

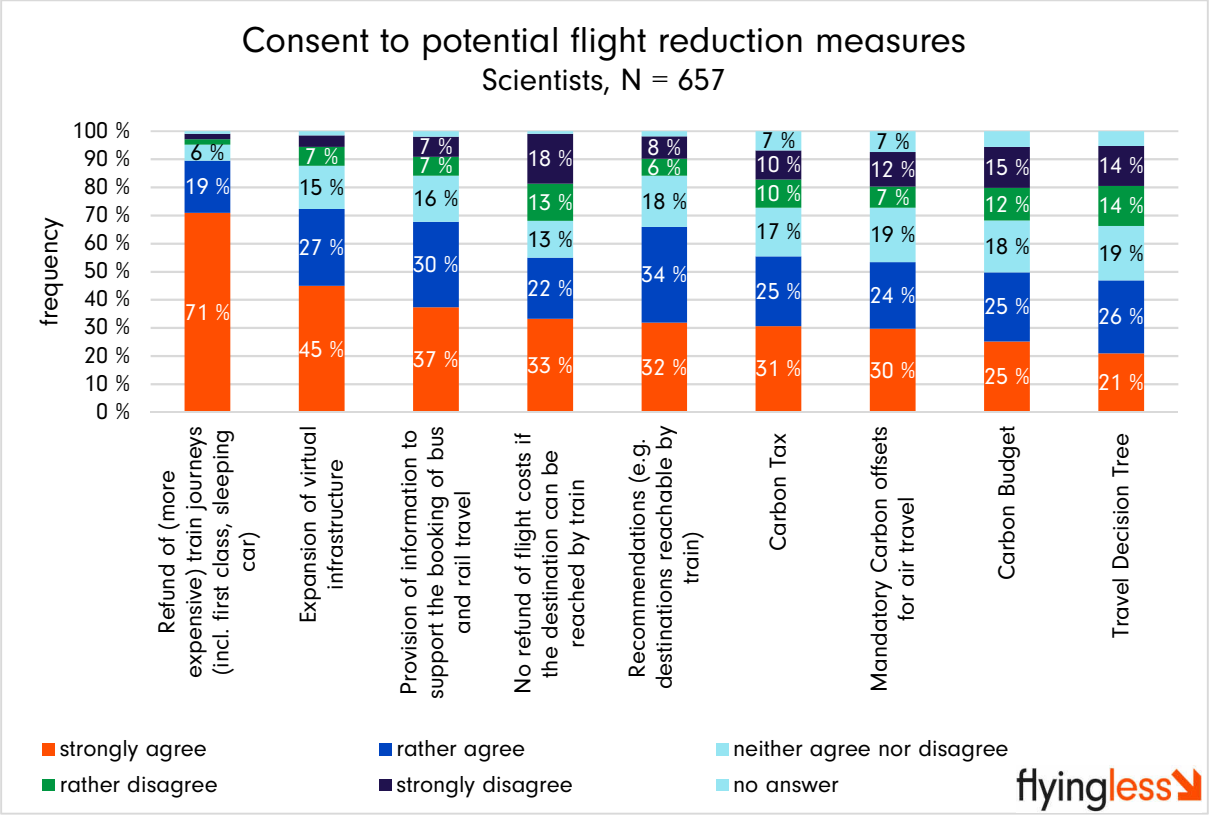

Figure 13: Consent to potential flight reduction measures. Aggregated status group, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439). Relative frequency of mentions (Y-axis) per sub-answer (flight reduction measures; X-axis).

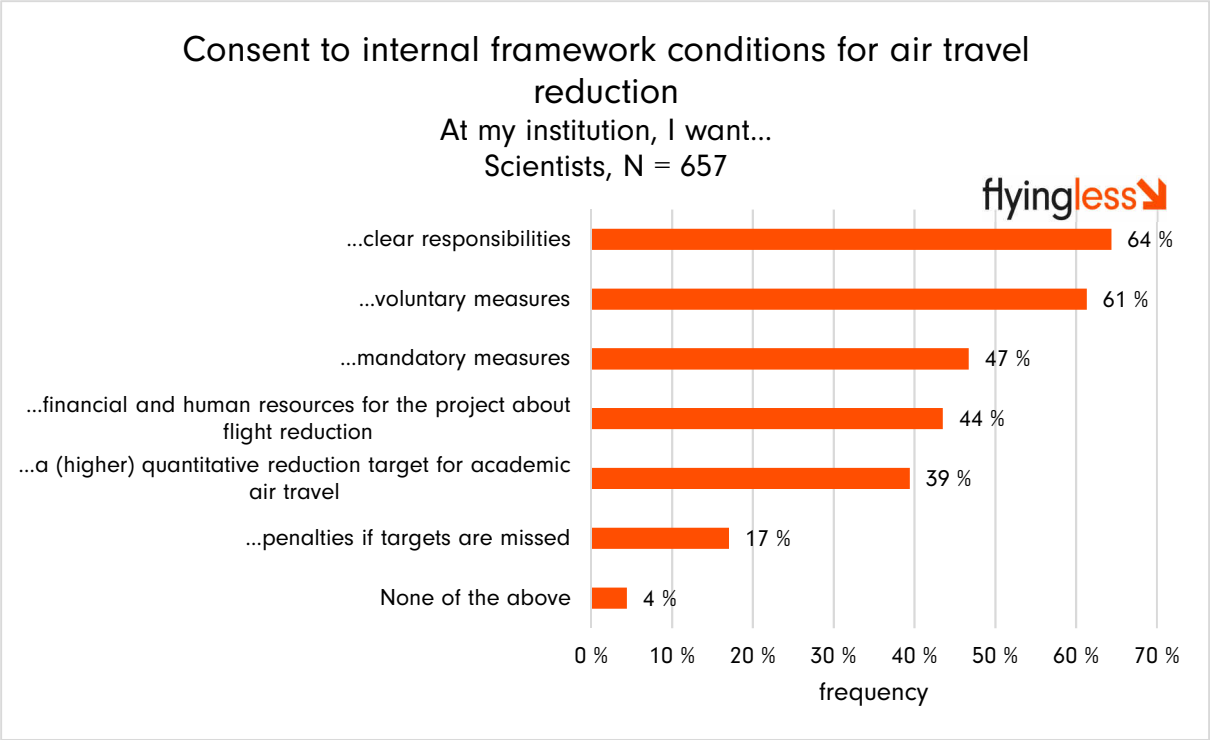

Figure 14: Consent to internal framework conditions for air travel reduction. Relative frequency of mentions (X-axis), aggregated status group, N = 657 (professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439) for different internal framework conditions (Y-axis).

Key message: As shown in Fig. 14, 39 % are in favor of a (higher) quantitative reduction target for business air travel, and when asked specifically about the level of the reduction target, then 30 % voted for a reduction target of 41-50 % but also 27% for a reduction target of 71-100 % (Fig. 15).

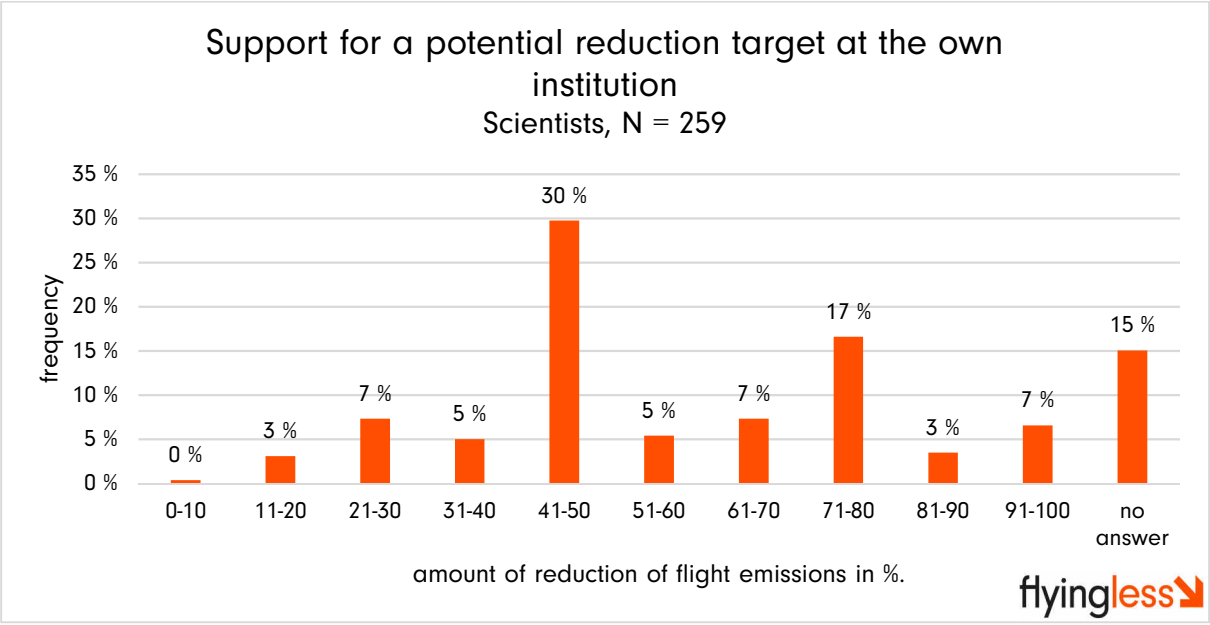

Figure 15: Support for a potential reduction target at the own institution (respondents' estimate). Relative frequency of mentions (Y-axis) per aggregated level of reduction of aviation emissions in % (X-axis). The question was subject to the condition of endorsing a (higher) reduction target in the previous question. Accordingly, only 39 % of the respondents took part. The relative frequency therefore refers to the sample size of 259.

7. Status groups compared

In this chapter, the results for professors & group leaders (N=218) are compared with those of scientists without professorships / group leaders (N=439).

7.1. Average mobility (flight/train/bus) and use of virtual format per year prior to the COVID-19 pandemic

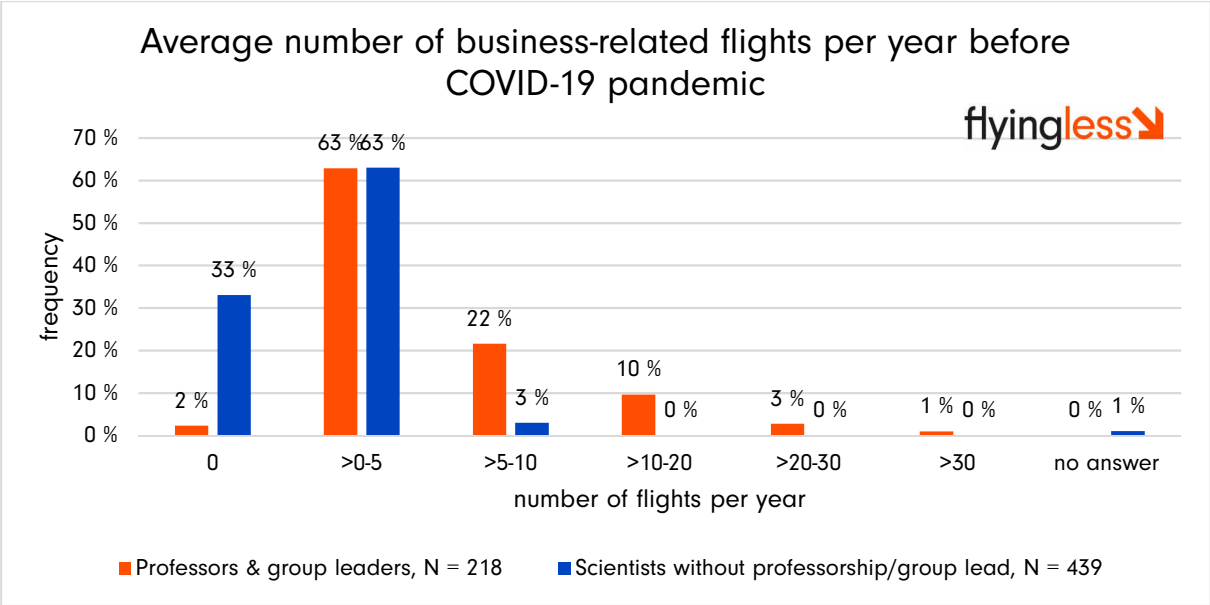

Figure 16: Average number of business-related flights per year before COVID-19 pandemic (respondents' estimate). Relative frequency of mentions (Y-axis) per aggregated number of air travels per year (X-axis). Status groups in comparison: professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439.

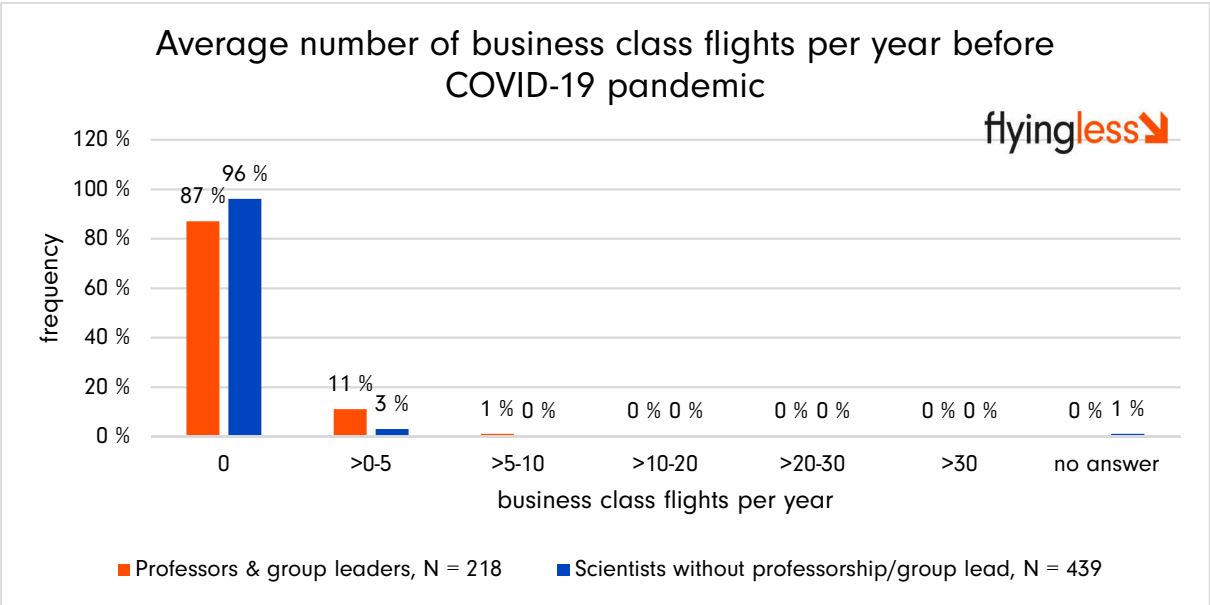

Figure 17: Average number of business class flights per year before COVID-19 pandemic (respondents' estimate). Relative frequency of mentions (Y-axis) per aggregated number of flights per year (X-axis). Status groups compared: professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439.

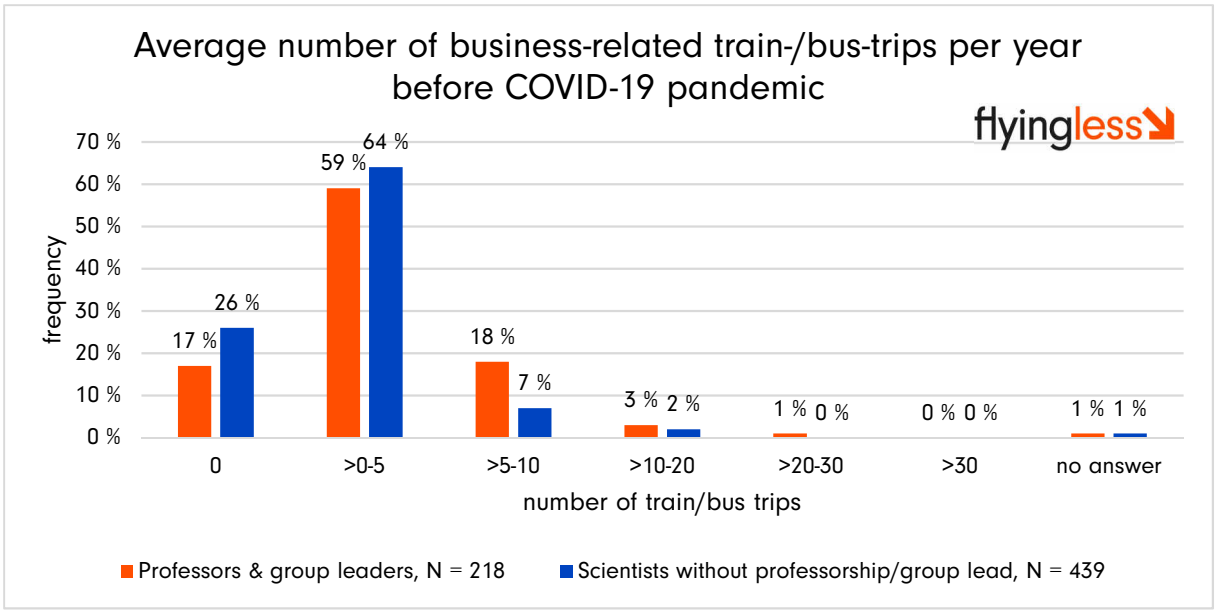

Figure 18: Average number of business-related train/bus trips of 6 h or more per year before COVID-19 pandemic (respondents' estimate). Relative frequency of mentions (Y-axis) per number of train/bus trips per year (X-axis). Status groups in comparison: professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439.

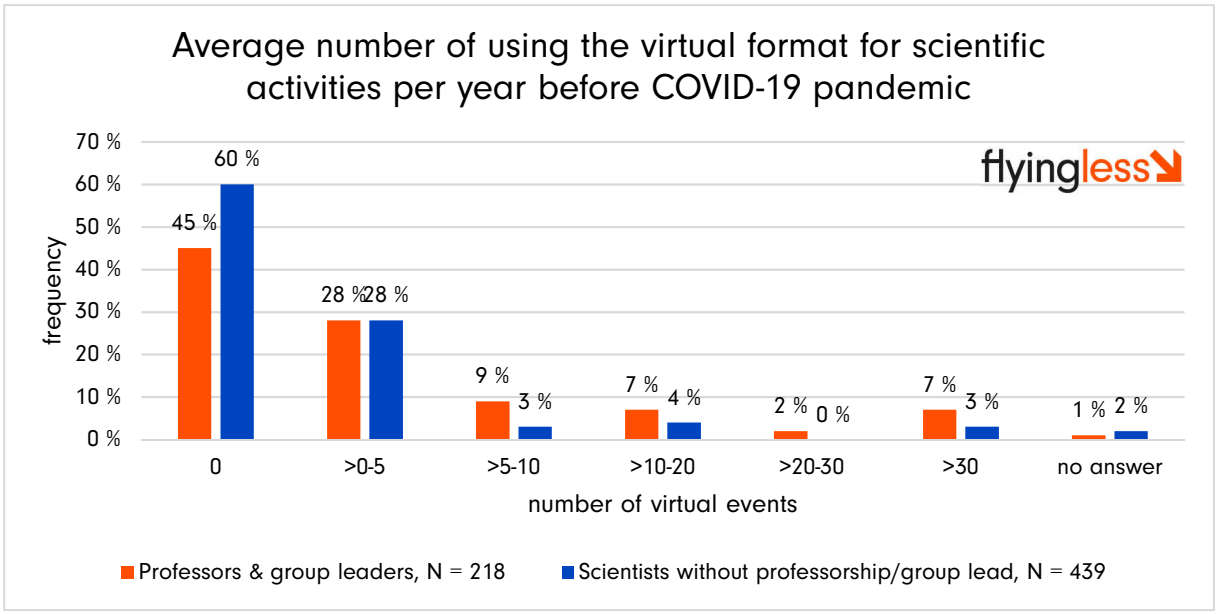

Figure 19: Average number of using the virtual format for scientific activities per year before COVID-19 pandemic (respondents' estimate). Relative frequency of mentions (Y-axis) per number of virtual events/meetings per year (X-axis). Status group in comparison: professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439.

7.2. Relevance of different reasons for business air travel

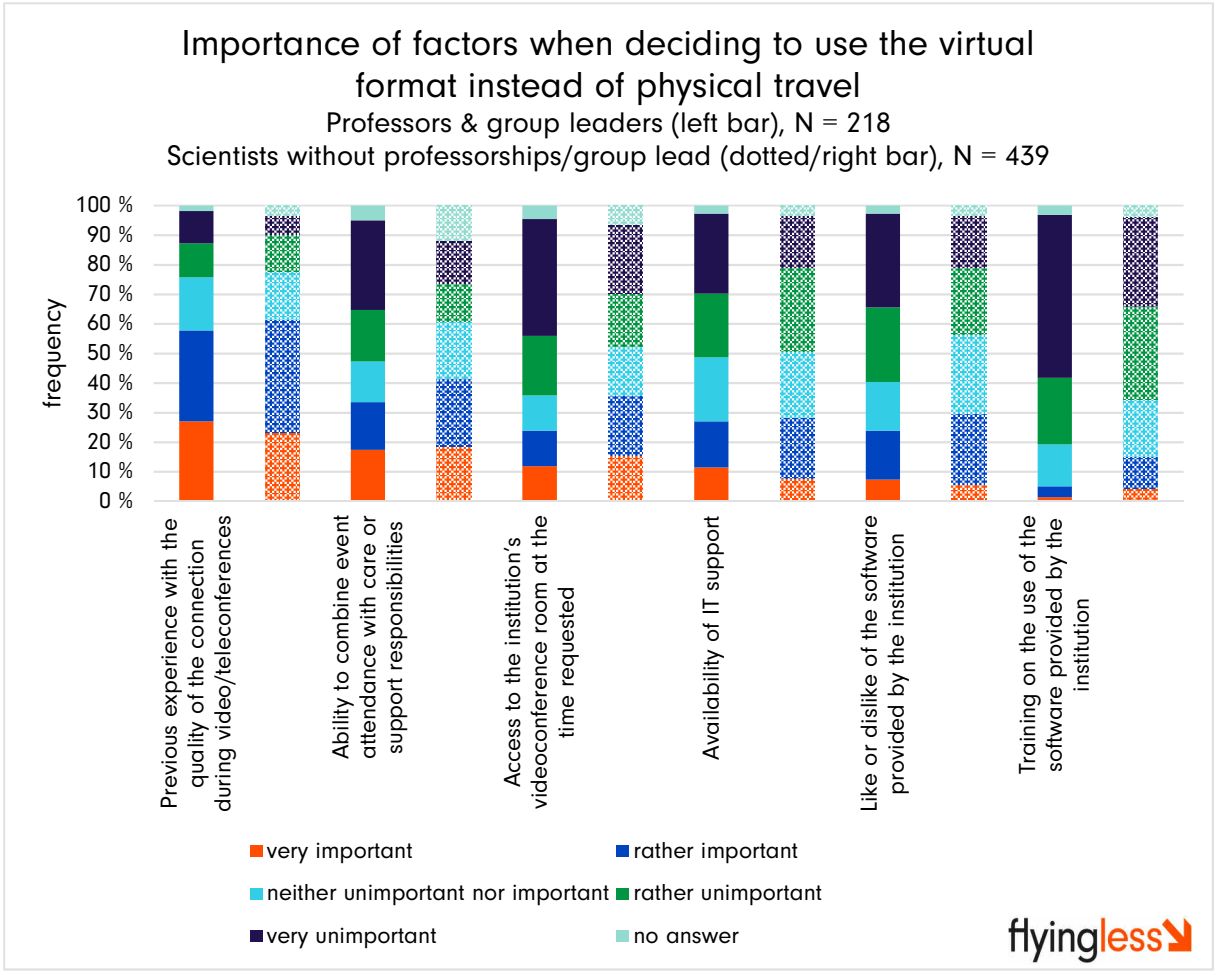

Figure 20: Importance of factors when deciding to use the virtual format instead of physical travel. Comparison of status groups: professors & group leaders, N = 218 and scientists without professorship/group lead (dotted), N = 439. Relative frequency of mentions (Y-axis) per sub-answer (factor for deciding about using the virtual format; X-axis).

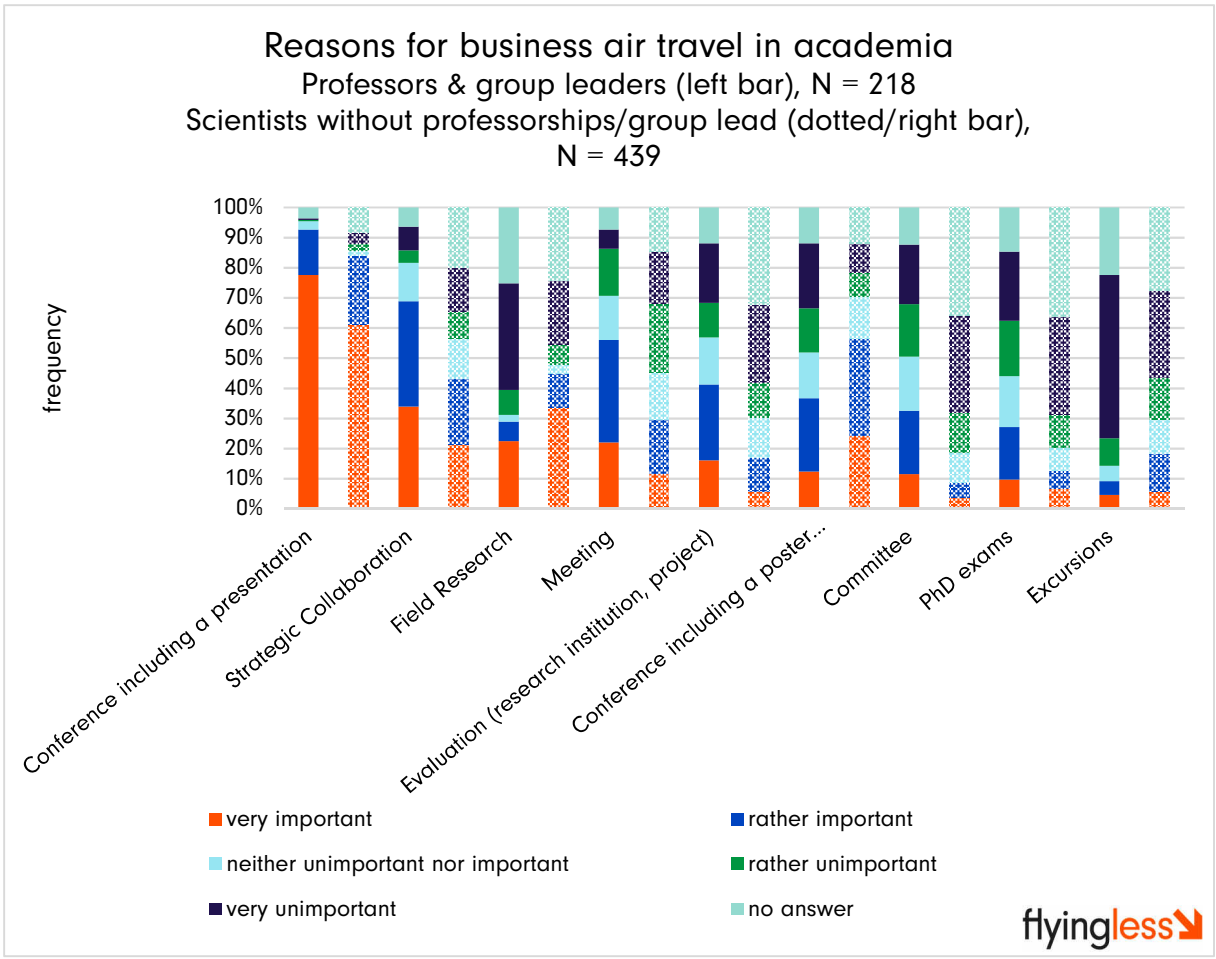

Figure 21: Reasons for business air travel in academia. Comparison of status groups: professors & group leaders, N = 218 and scientists without professorship/group lead (dotted), N = 439. Relative frequency of mentions (Y-axis) per sub-answer (travel reason; X-axis).

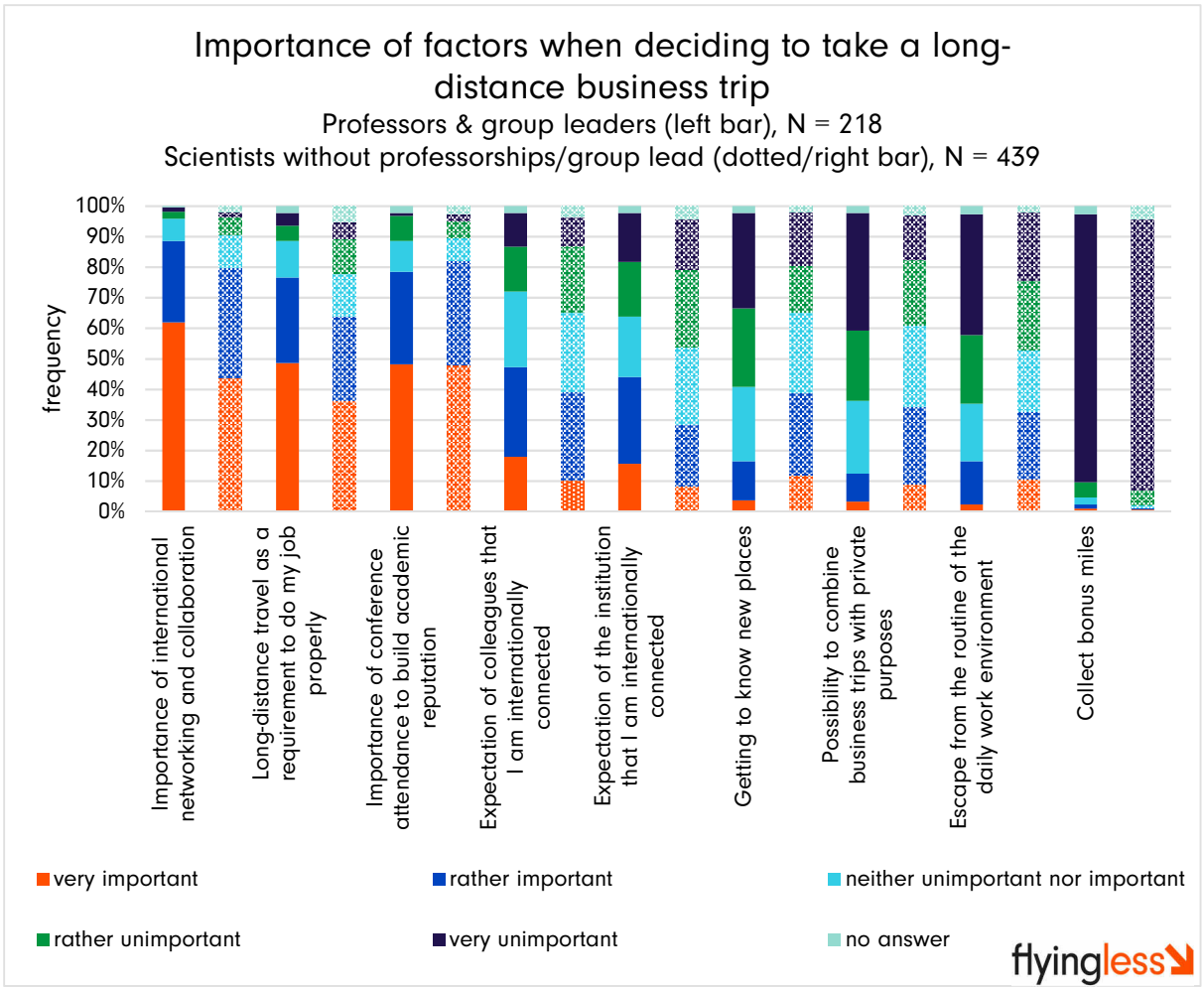

Figure 22: Importance of factors when deciding to take a long-distance business trip. Comparison of status groups: professors & group leaders, N = 218 and scientists without professorship/group lead (dotted), N = 439. Relative frequency of mentions (Y-axis) per sub-answer (factor for considering a business trip in the academic field; X-axis).

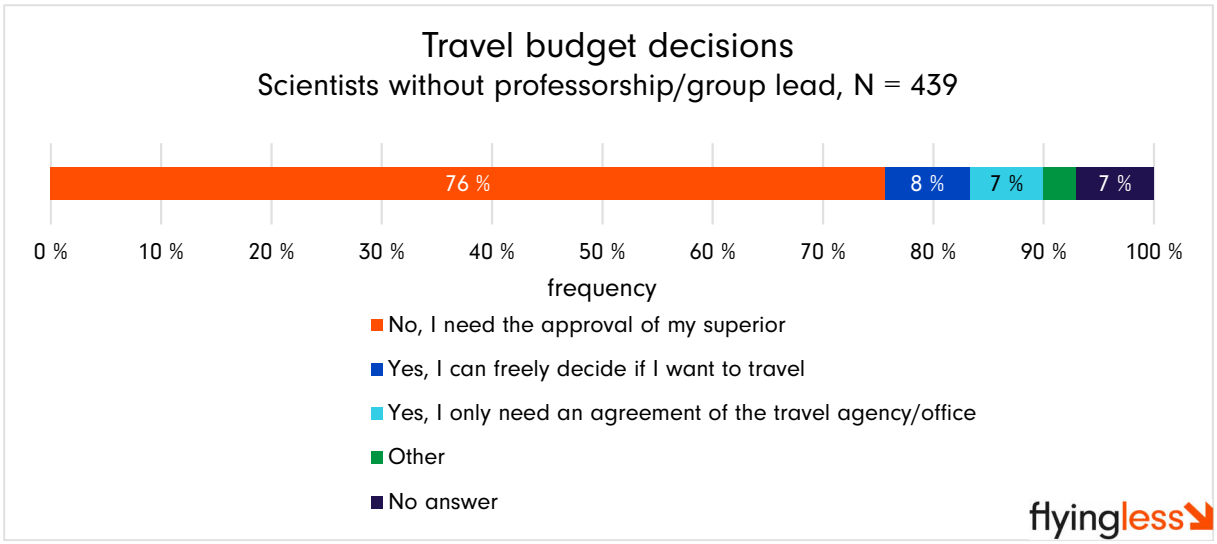

Figure 23: Travel budget decisions for scientists without professorship/group lead, N = 439. Relative frequency of mentions (X-axis) per response option.

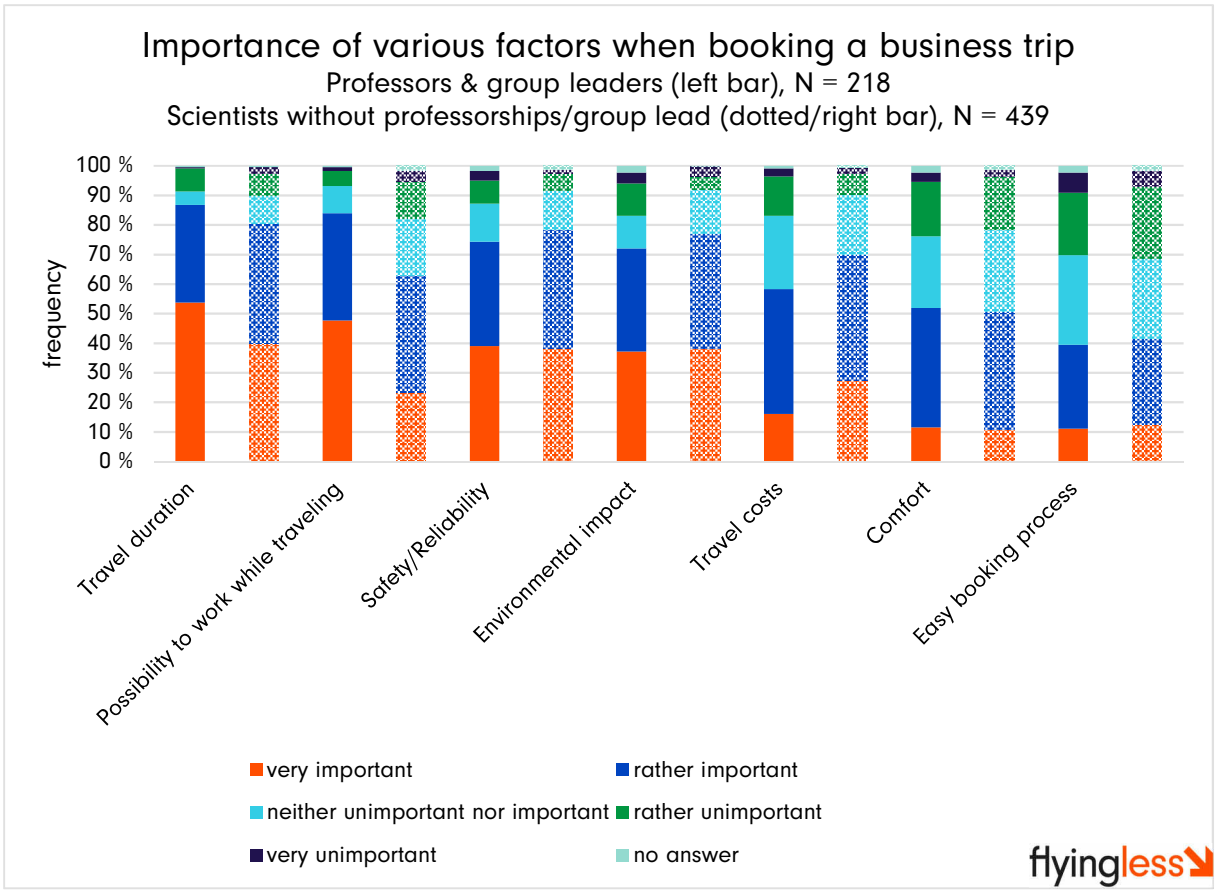

Figure 24: Importance of various factors when booking a business trip. Status groups compared: professors & group leaders, N = 218 & scientists without professorship/group lead (dotted), N = 439. Relative frequency of mentions (Y-axis) per sub-answer (various factors when booking a business trip; X-axis).

7.3. Behaviour changes and measures

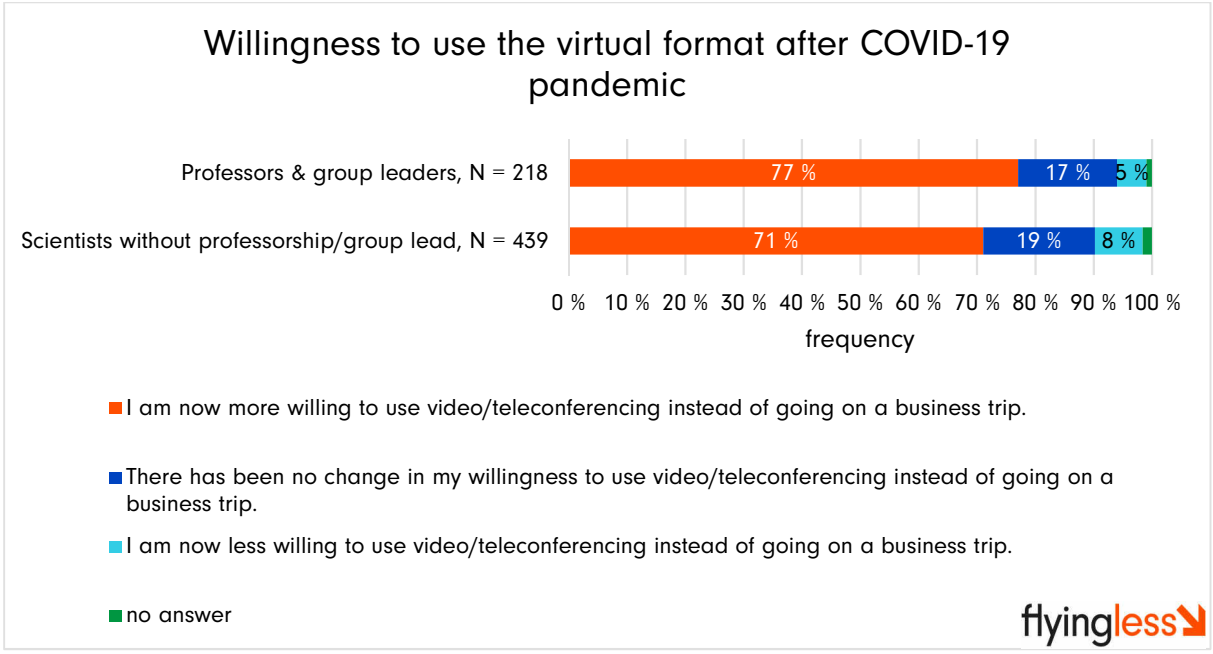

Figure 25: Willingness to use the virtual format after COVID-19 pandemic. Relative frequency of mentions (X-axis). Status groups in comparison: professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439.

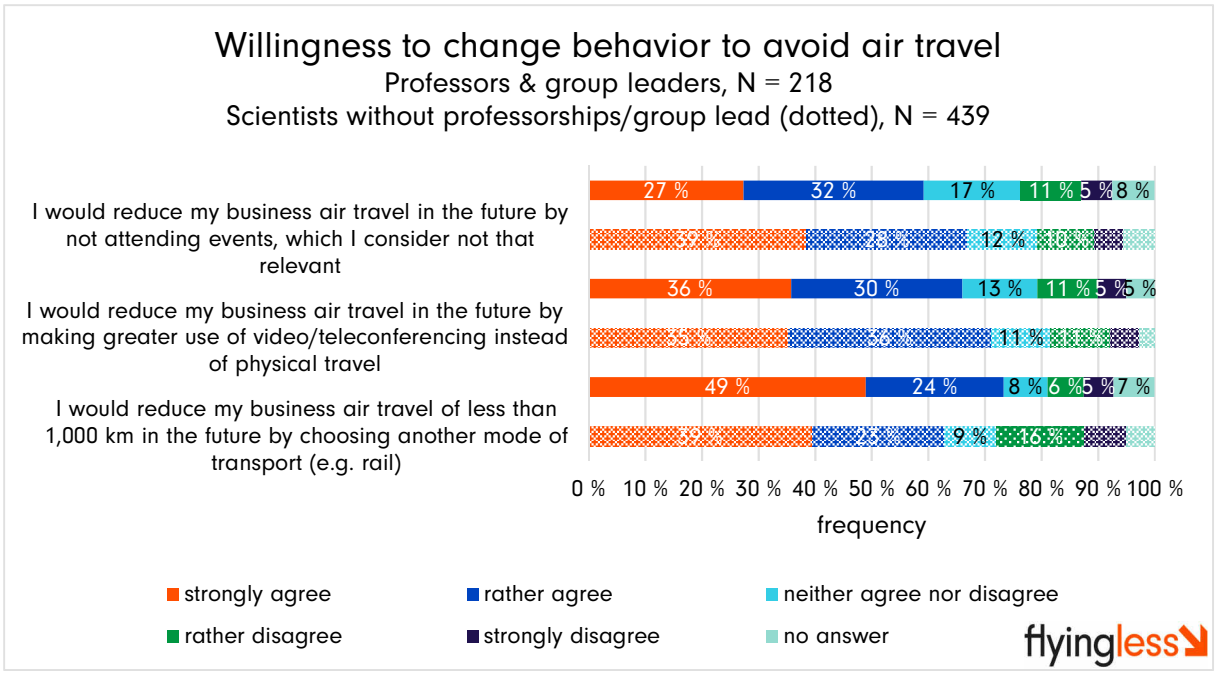

Figure 26: Willingness to change behaviour to avoid air travel. Status groups in comparison: professors & group leaders, N = 218 and scientists without professorship/group lead (dotted), N = 439. Relative frequency of mentions (Y-axis) per sub-answer (agreement with statements on future mobility behaviour to avoid business air travel; X-axis).

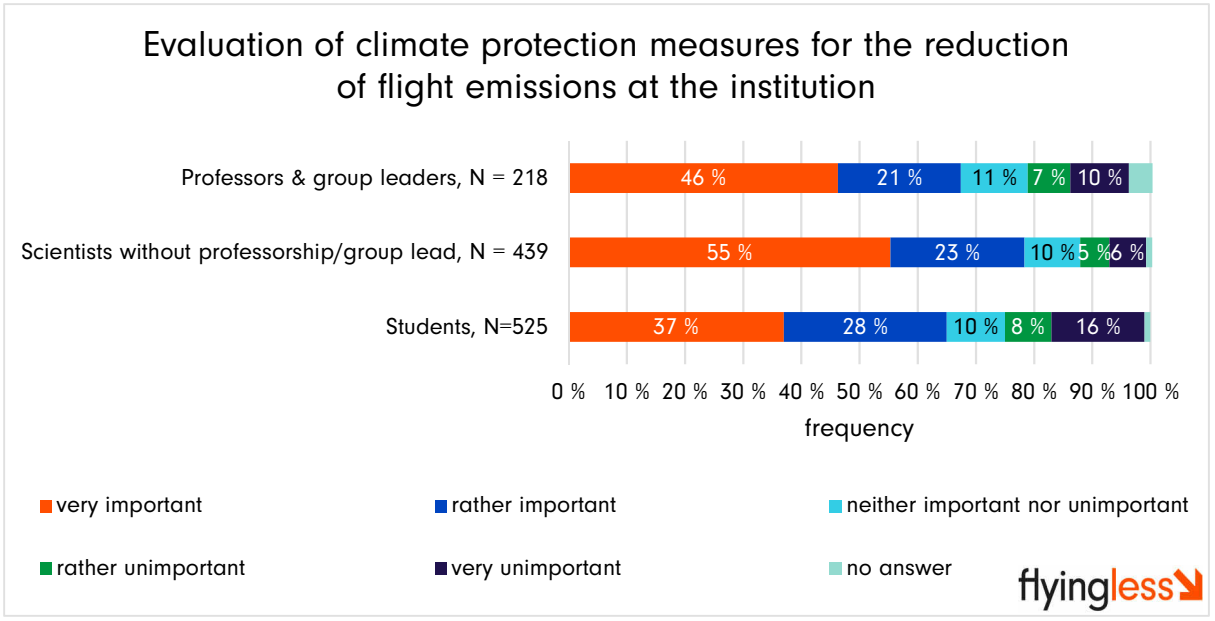

Figure 27: Evaluation of climate protection measures for the reduction of flight emissions at the own institution. Relative frequency of mentions (X-axis) per status group: professors & group leaders, N = 218 and scientists without professorship/group lead, N = 439 & students, N = 525 (Y-axis).

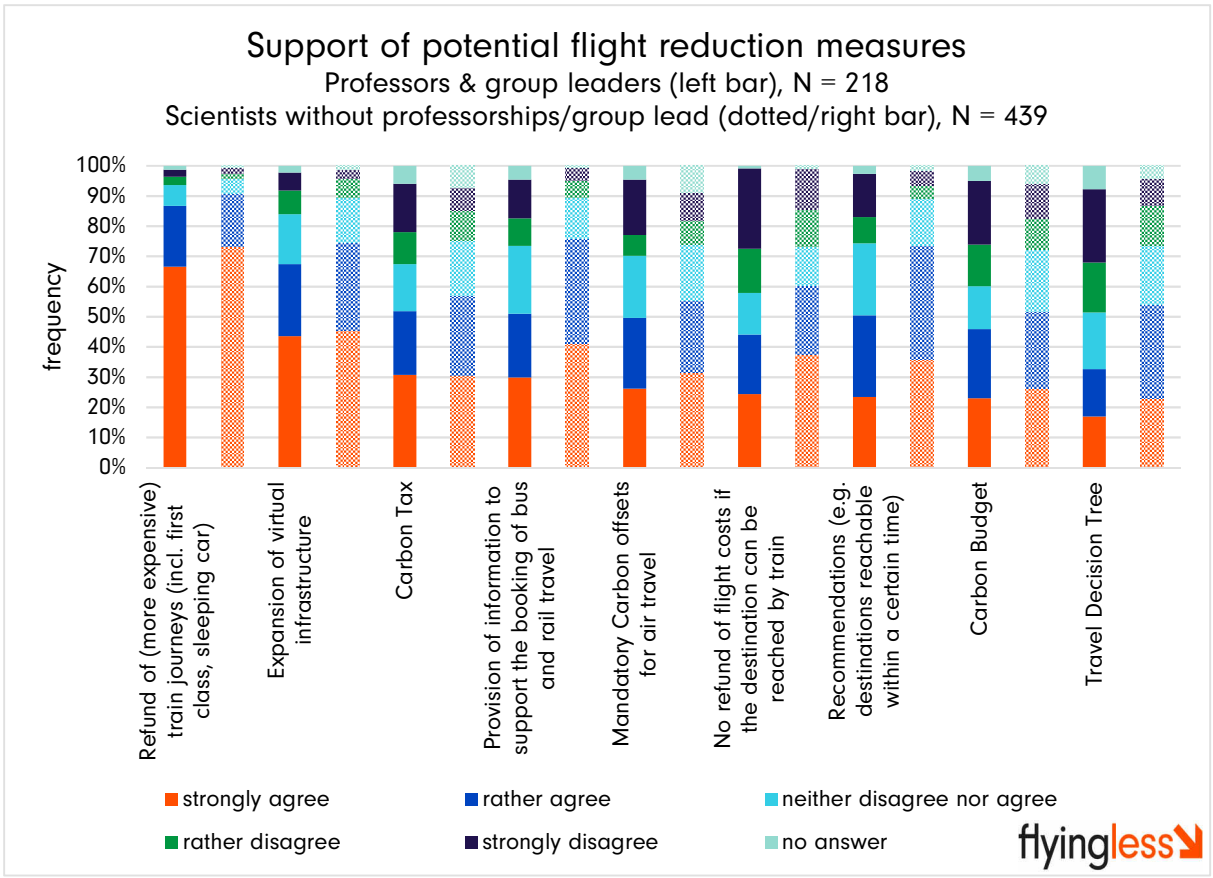

Figure 28: Support of potential flight reduction measures. Comparison of status groups: professors & group leaders, N = 218 and scientists without professorship/group lead (dotted), N = 439. Relative frequency of mentions (Y-axis) per sub-answer (flight reduction measures; X-axis).

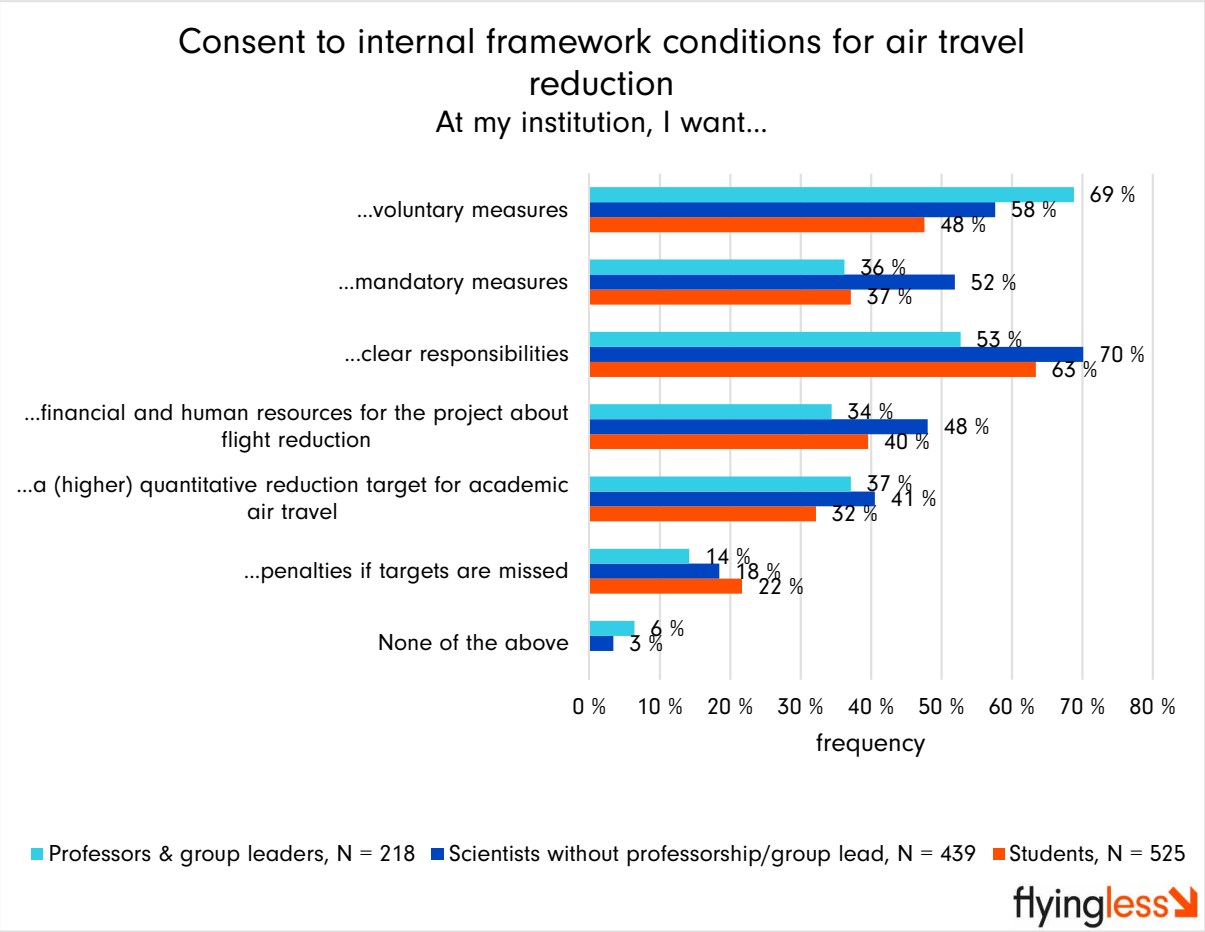

Figure 29: Consent to internal framework conditions for air travel reduction. Relative frequency of mentions (X-axis) per status group: professors & group leaders, N = 218, academics without professors/group leaders, N = 439 and students, N = 525 for various internal framework conditions (Y-axis).

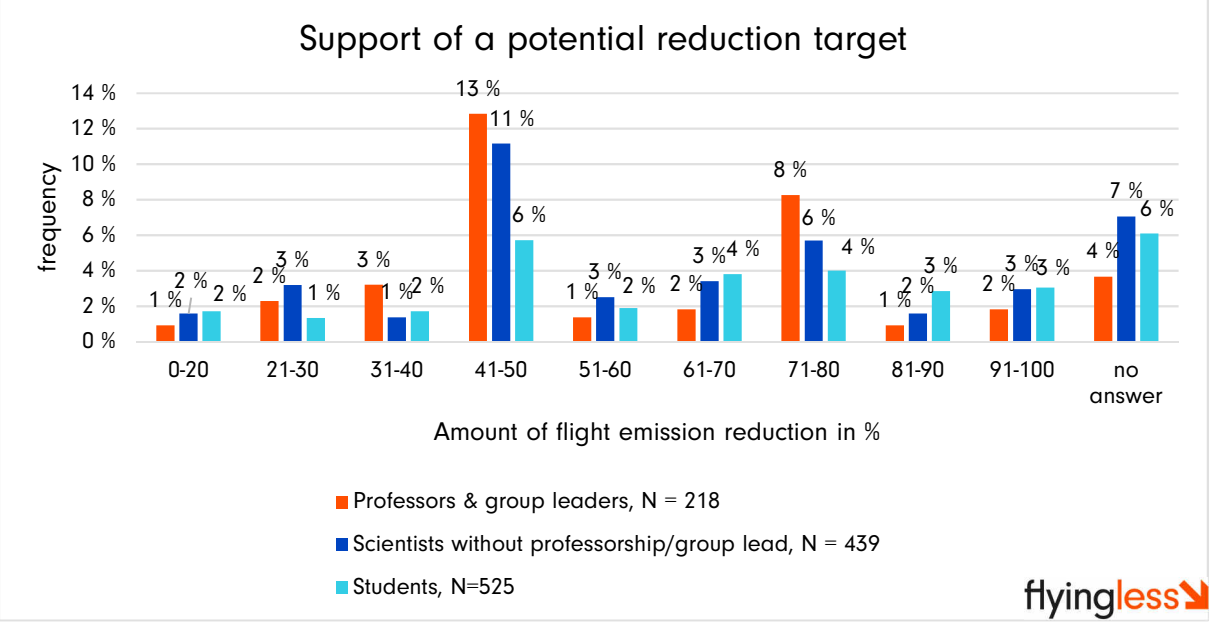

Figure 30: Support of a potential reduction target (at the own institution) (respondents' estimate). Relative frequency of mentions (Y-axis) per aggregated level of reduction of aviation emissions in % (X-axis). Status groups in comparison: professors & group leaders, N = 218, scientists without professorship/group leadership, N = 439 and students, N = 525. The question was subject to the condition in the previous question of endorsing a (higher) reduction target. Accordingly, only 37 % (professors & group leaders), 41 % (scientists without professorship or group lead) and32 % (students) of the respondents took part. The relative frequency refers to the total sample size of the respective status group.

8. Student results (N = 525)

8.1. Structuring the respondent group

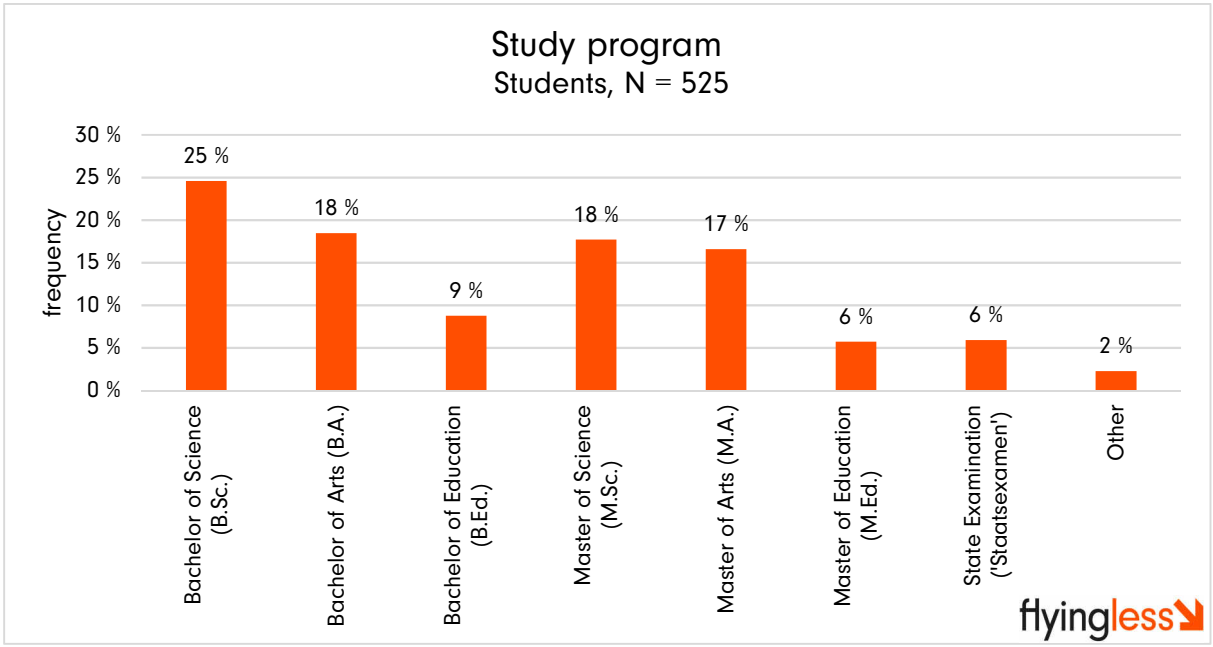

Figure 31: Type of program. Status group: students, N = 525. Relative frequency (y-axis) of different university graduation goals (x-axis).

8.2. Flight behaviour during studies

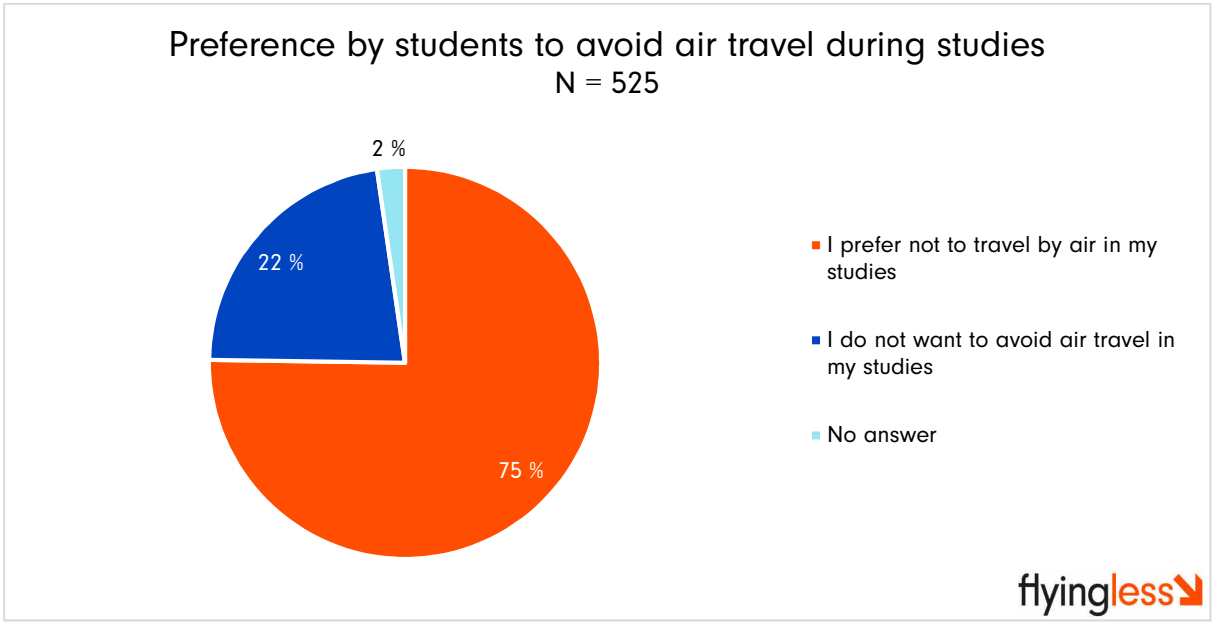

Figure 32: Preference by students to avoid air travel during studies (within the curriculum). Status group: students, N = 525. Relative frequency of willingness to avoid air travel.

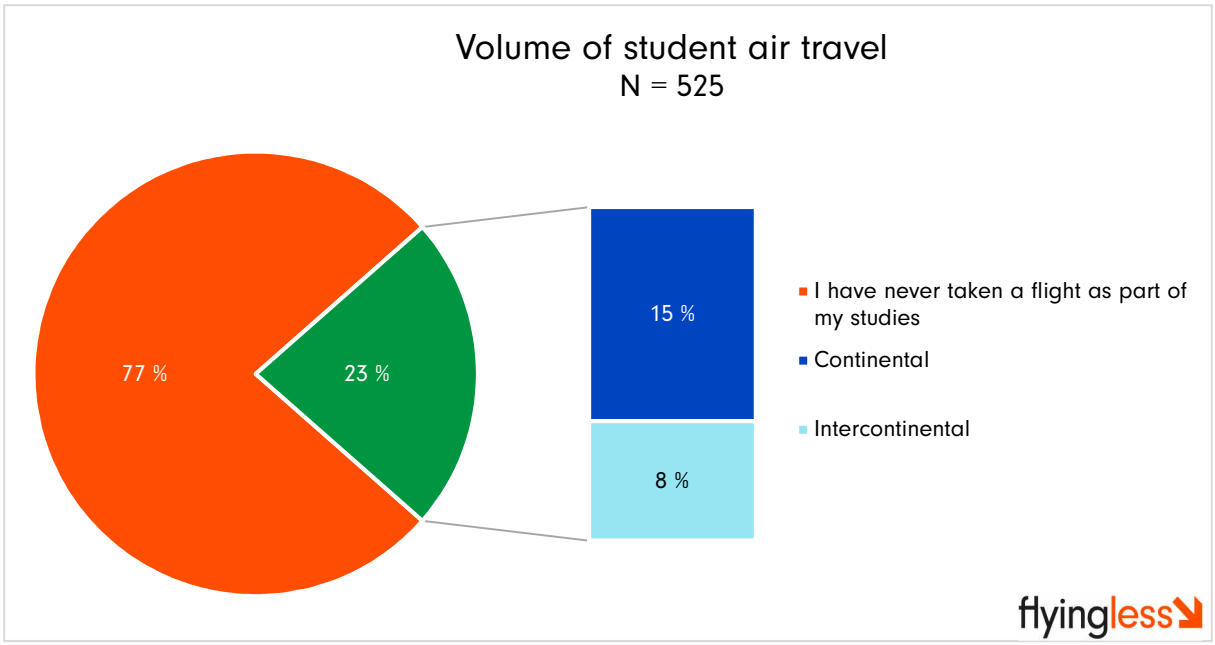

Figure 33: Volume of student air travel. Status group: students, N = 525. Relative frequency of no or at least one flight during studies & breakdown into continental and intercontinental destinations.

8.3. Previous air travel during studies

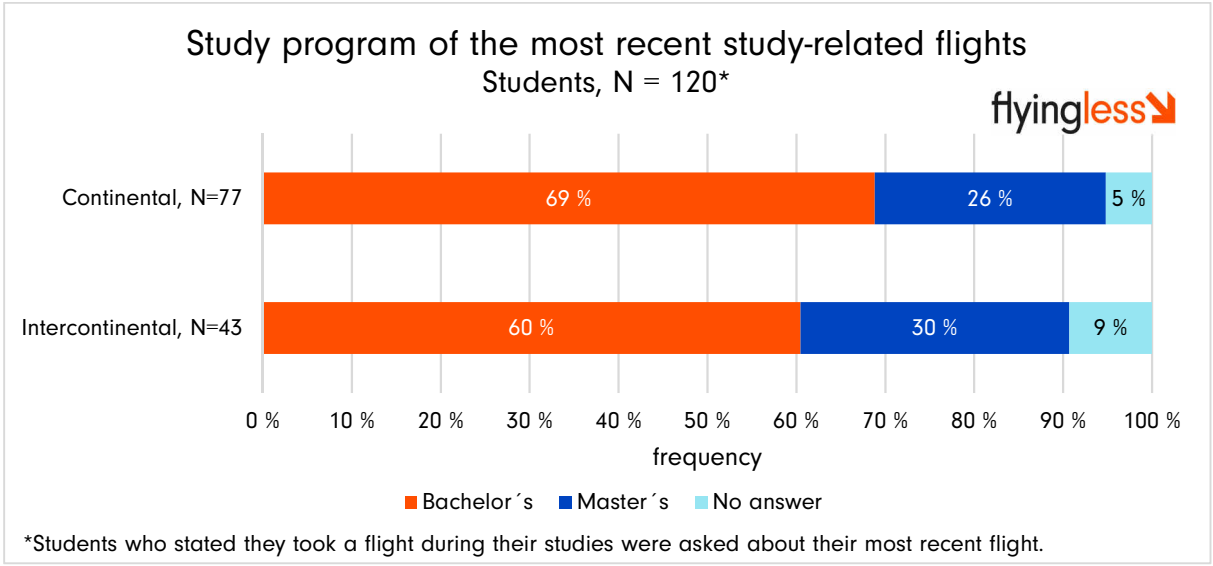

Figure 34: Study program of the most recent study-related flights. Status group: Students, N = 120. Relative frequency of air travel by graduation goal (x-axis) for continental and intercontinental air travel (y-axis).

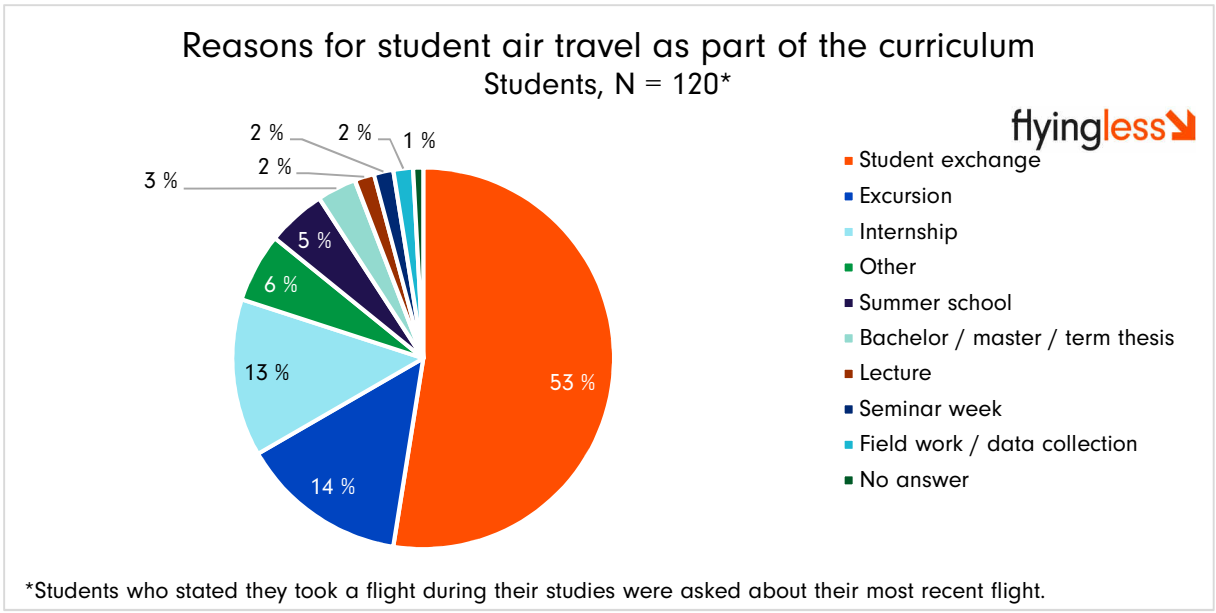

Figure 35: Purpose of this flight. Status group: Students, N = 120. Relative frequency per reason for air travel.

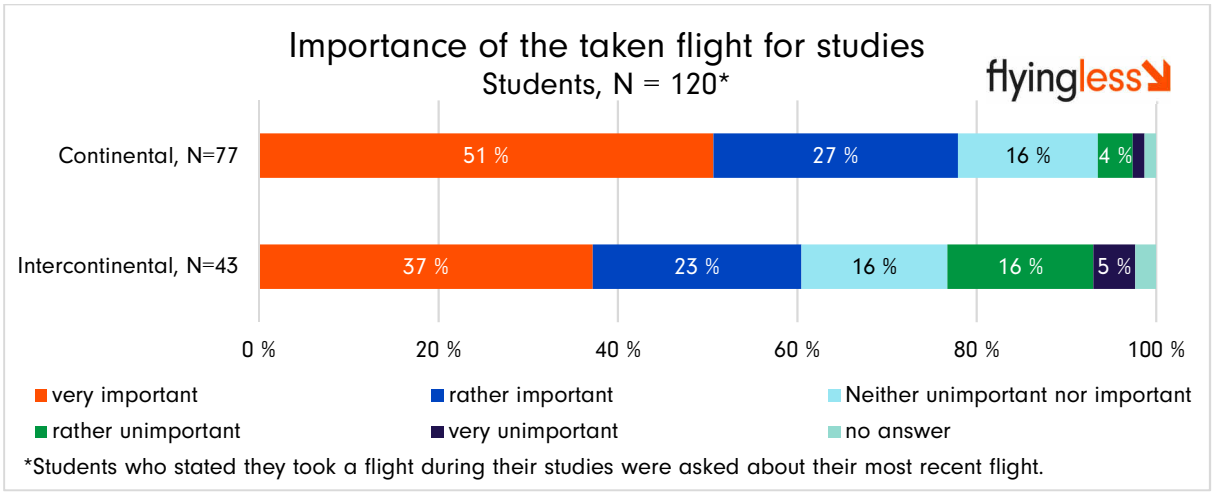

Figure 36: Importance of taken air travel for studies. Status group: students, N = 120. Relative frequency of importance (x-axis) for continental and intercontinental air travel.

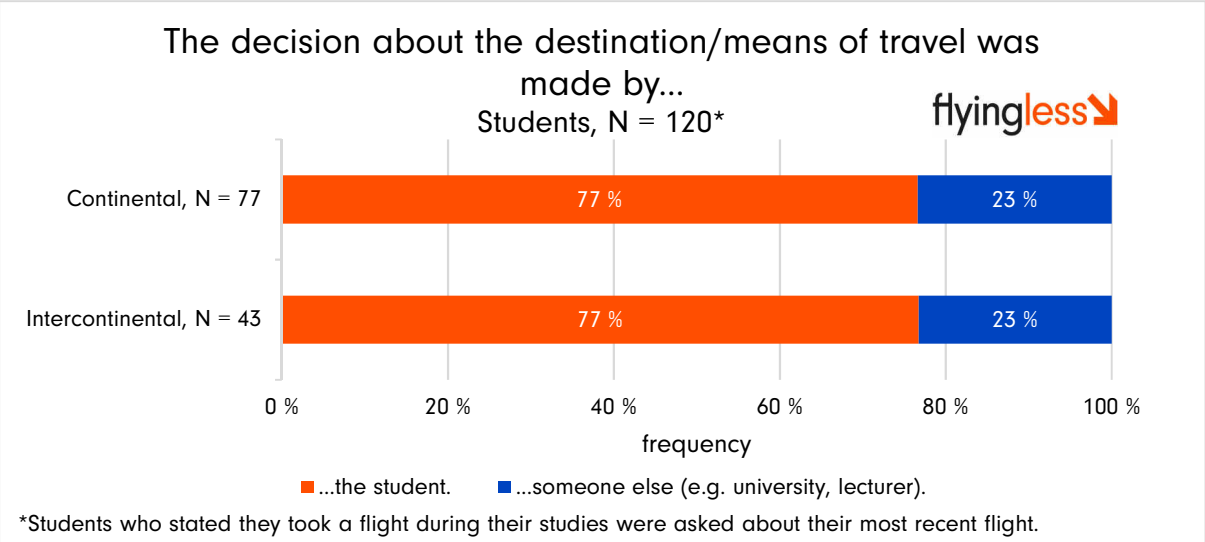

Figure 37: Destination decision maker. Status group: students, N = 120. Relative frequency of decision maker (x-axis) for continental and intercontinental air travel.

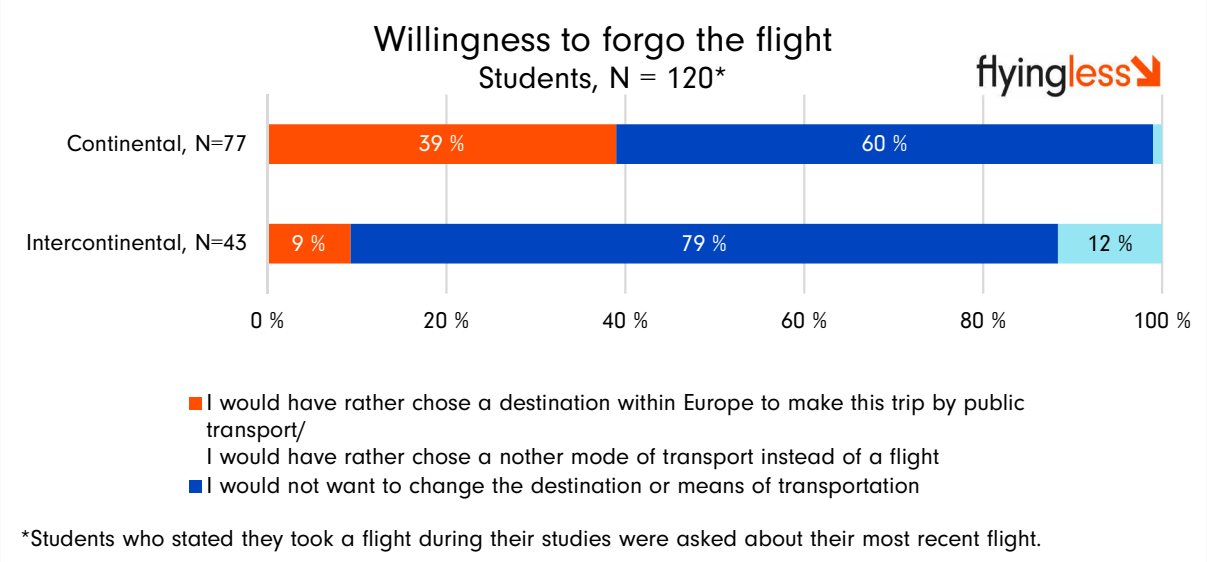

Figure 38: Willingness to forgo the flight. Status group: Students, N = 120. Relative frequency of willingness (x-axis) to use an alternative mode of transport (continental) or choose another destination within Europe (intercontinental) (y-axis).

8.4. Planned air travel as part of studies before or during the COVID-19 pandemic

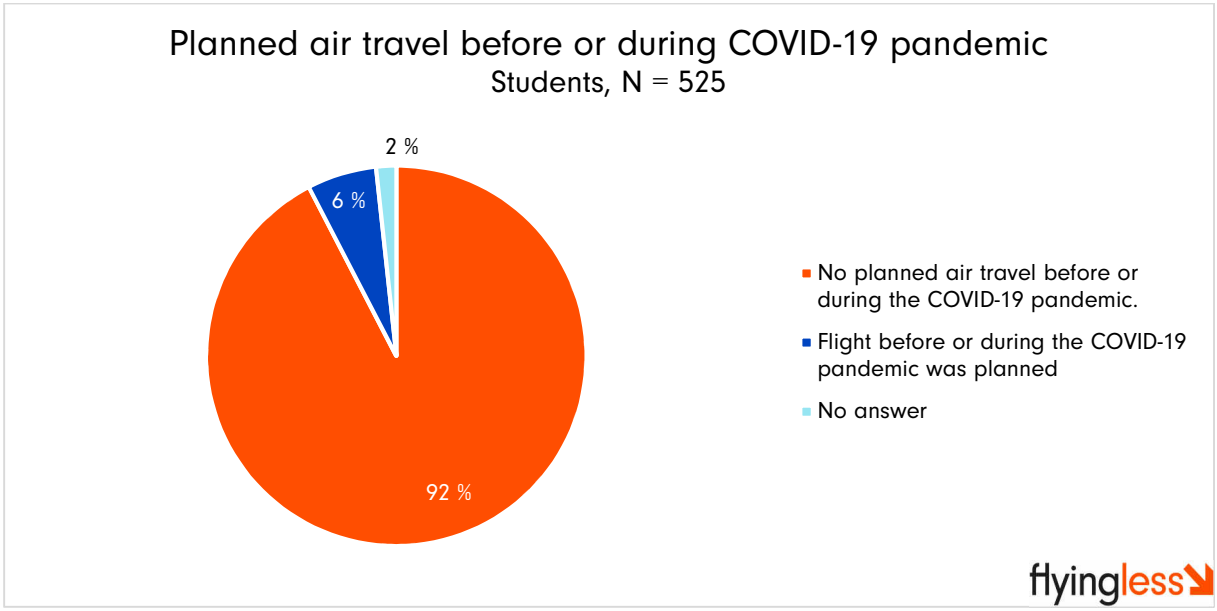

Figure 39: Planned air travel before or during COVID-19 pandemic. Status group: Students, N = 525. Relative frequency of (un)planned air travel.

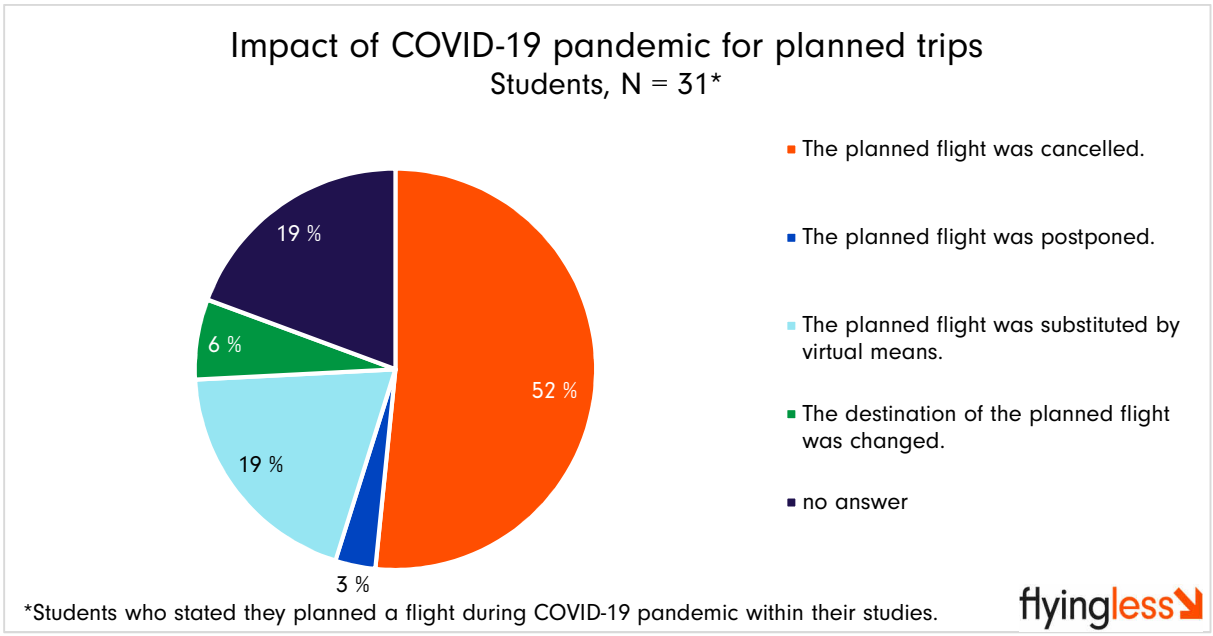

Figure 40: Impact of COVID-19 pandemic for planned trips. Status group: Students, N = 31. Relative frequency of different impacts on planned air travel.

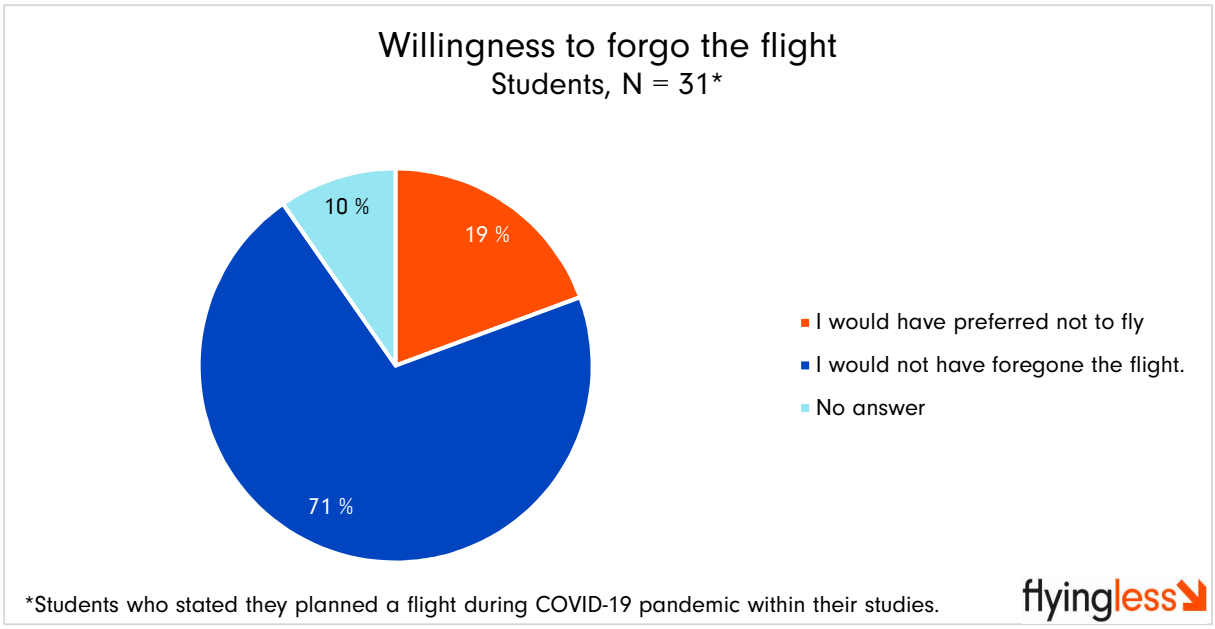

*Figure 41: Willingness to forgo the flight. Status group: Students, N = 31. Relative frequency of willingness (x-axis) to use/not use an alternative mode of transport for continental and intercontinental air travel (y-axis). *Students who stated they planned a flight during COVID-19 pandemic within their studies.*

8.5. Students who have not travelled by air as part of their studies

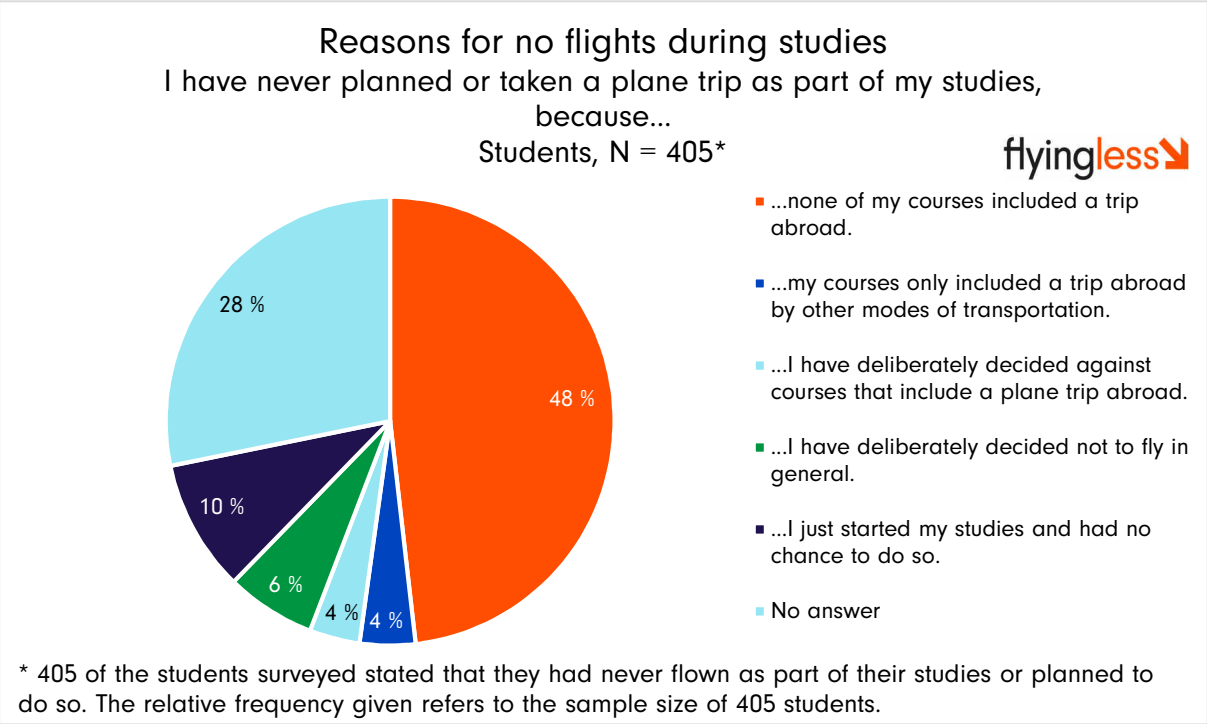

*Figure 42: Reasons for no flights during studies. Status group: Students, N = 405. Relative frequency of reasons for not traveling by air during studies. * 405 of the students surveyed stated that they had never flown as part of their studies or planned to do so. The relative frequency given refers to the sample size of 405 students.*

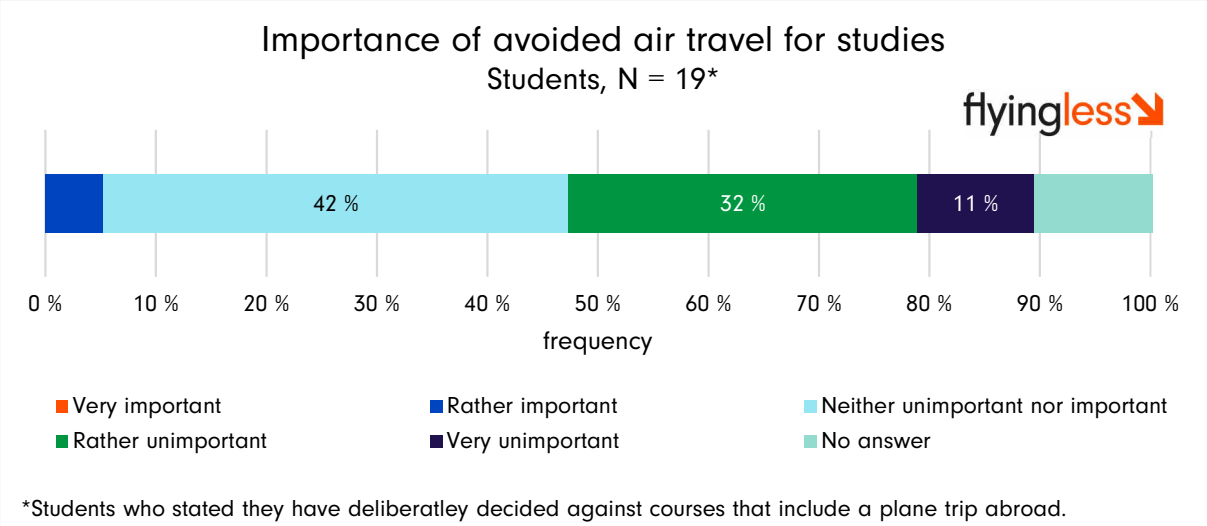

*Figure 43: Importance of avoided air travel for studies. Status group: students, N = 19. Relative frequency of importance of deliberately avoided air travel for studies. *Students who stated they have deliberatley decided against courses that include a plane trip abroad.*

8.6. Flight reduction measures (Students)

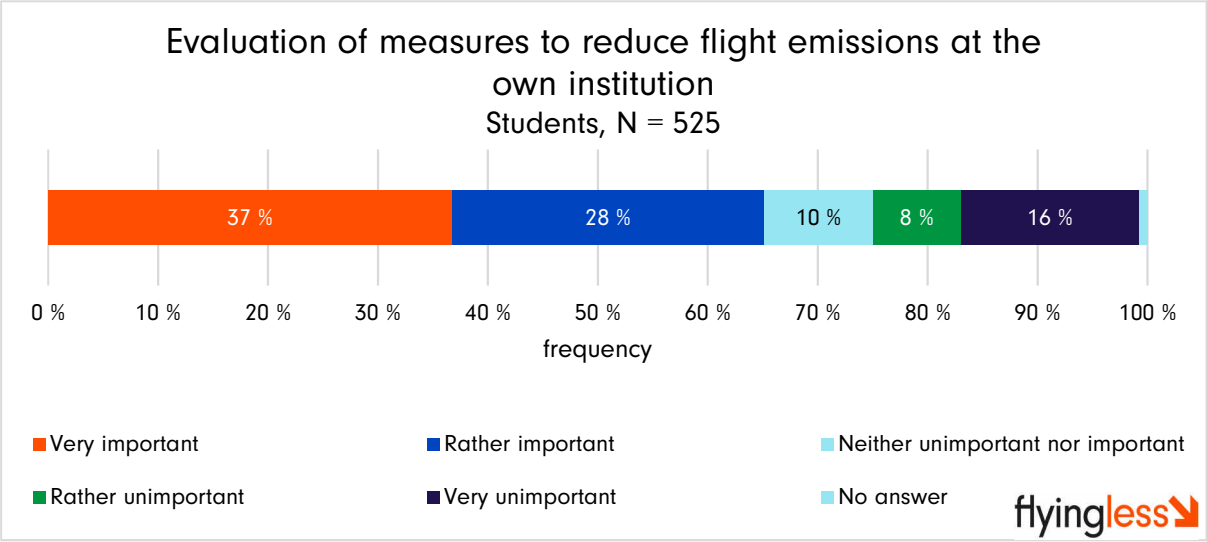

Figure 44: Evaluation of measures to reduce flight emissions at the own institution. Status group: Students, N = 525. Relative frequency of mentions (x-axis).

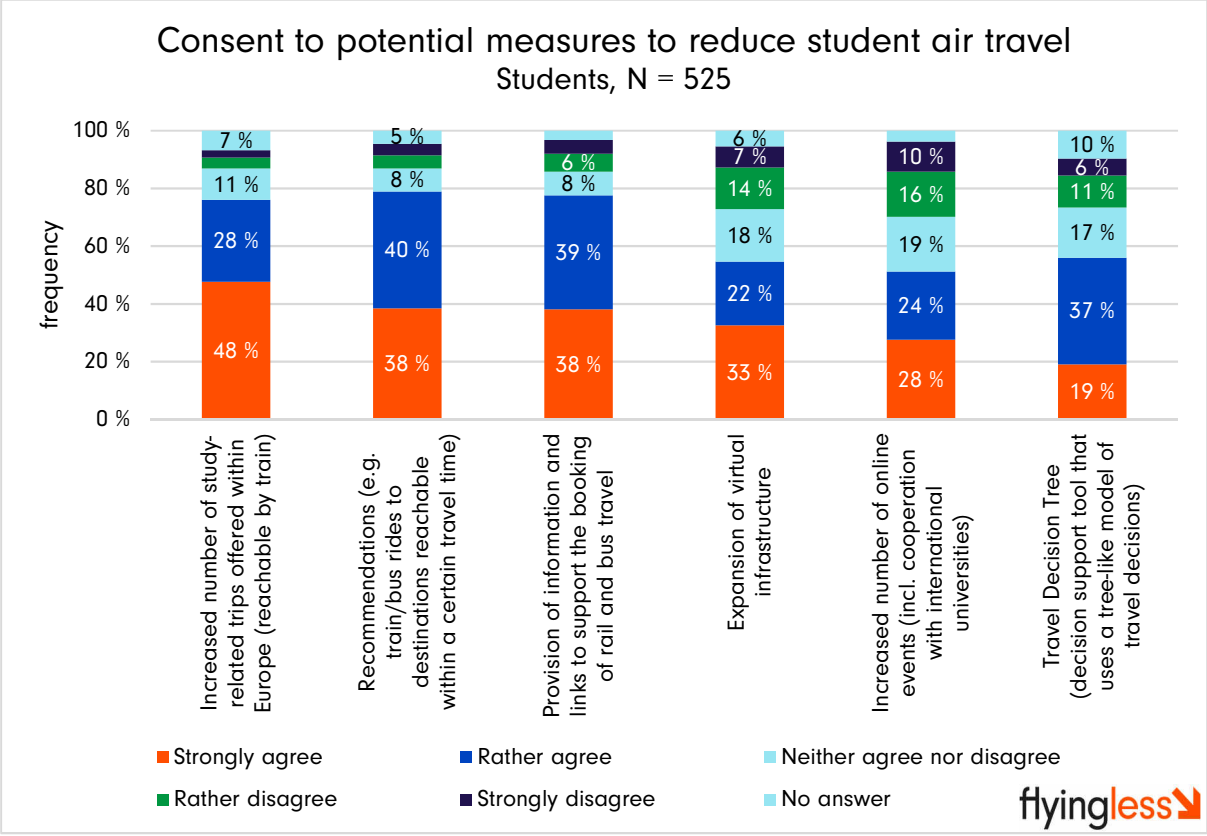

Figure 45: Consent to potential measures to reduce student air travel. Status group: Students, N = 525. Relative frequency of mentions (y-axis) per sub-answer (measures of flight reduction; x-axis).

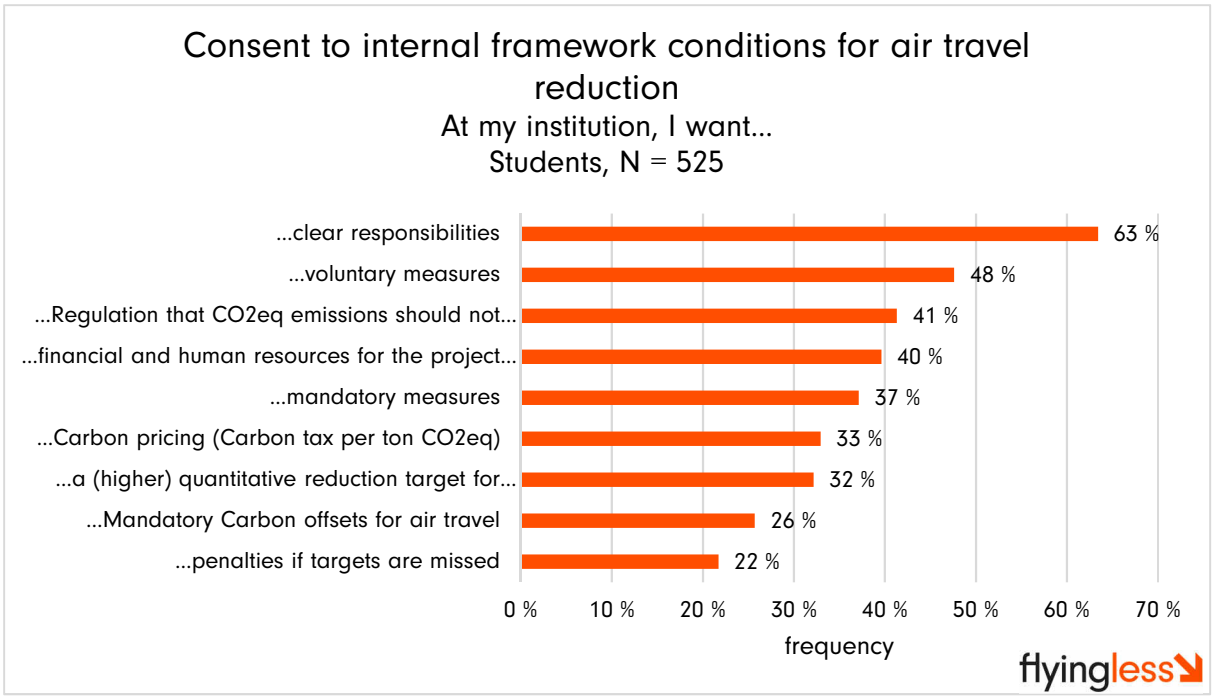

Figure 46: Consent to internal framework conditions for air travel reduction. Status group: Students, N = 525. Relative frequency of mentions (x-axis) for different internal framework conditions (y-axis).

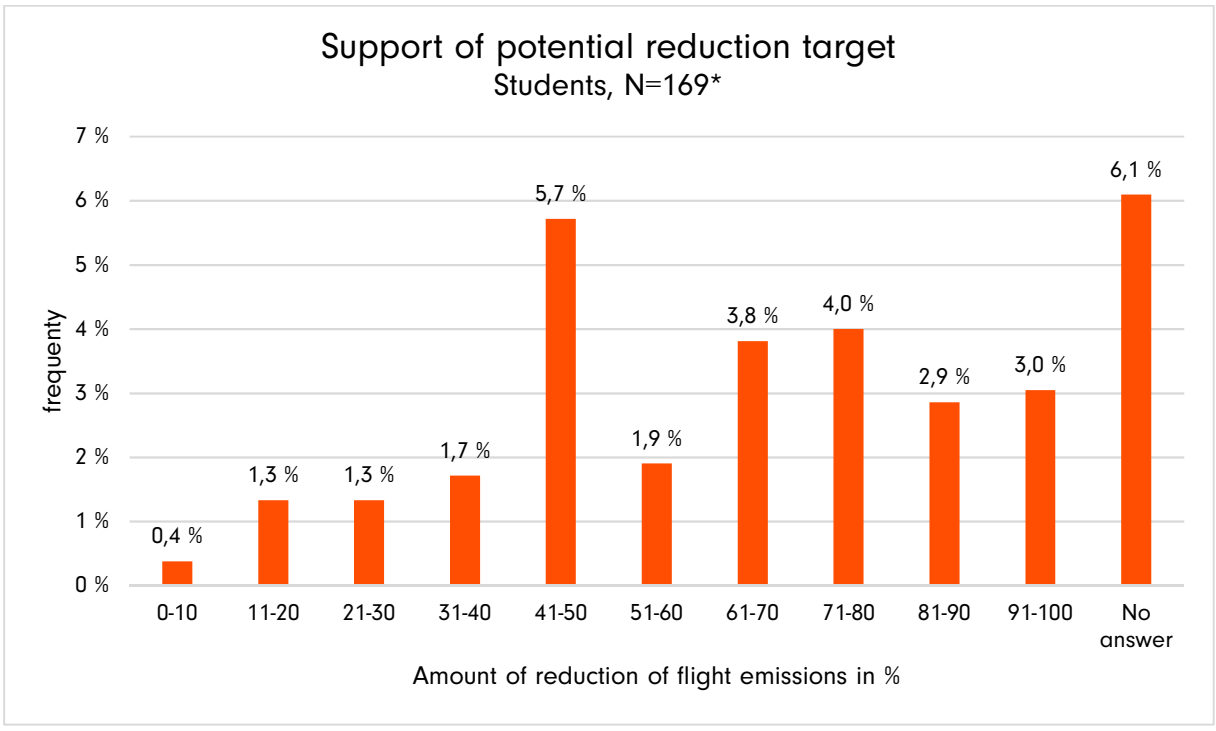

*Figure 47: Support of a potential reduction target by 2030 vs. pre COVID-19 (respondent estimate). Relative frequency of mentions (y-axis) per aggregate level of reduction in aviation emissions in % (x-axis). Status group: Students, N = 169. *The question was subject to the condition in the previous question to endorse a (higher) reduction target. Accordingly, only 32 % of the respondents (169 in absolute numbers) participated. However, the relative frequency refers to the entire sample size of the status group (N = 525).*

8.7. Air travel in further studies and later career

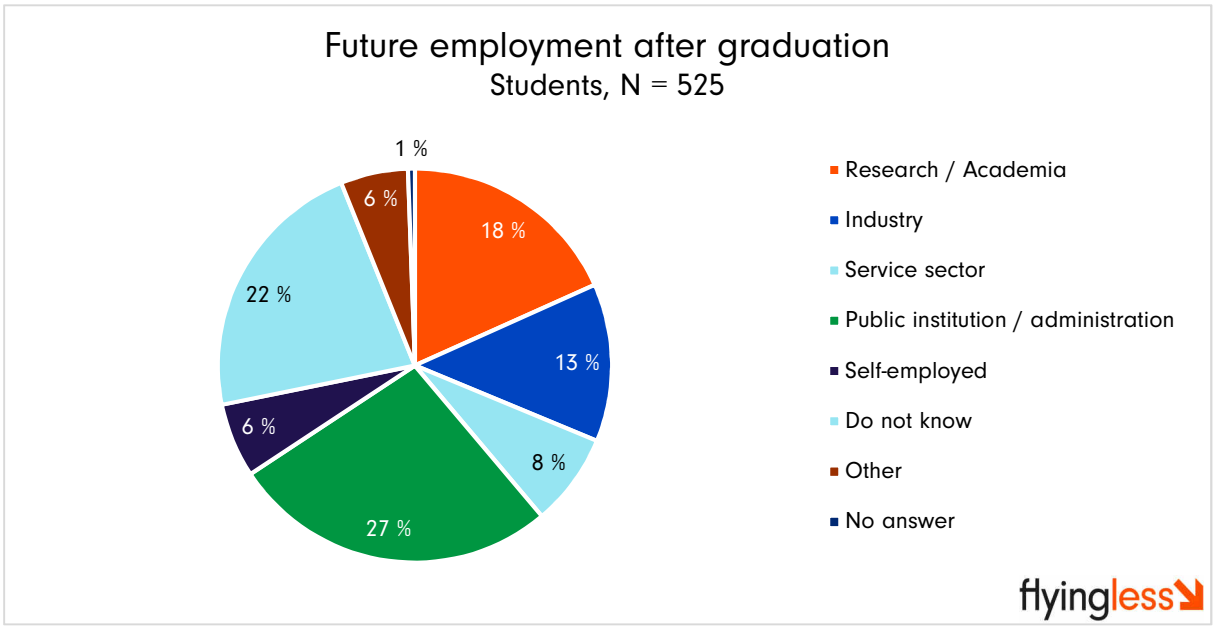

Figure 48: Future employment of students. Status group: Students, N = 525. Relative frequency of the employment areas mentioned.

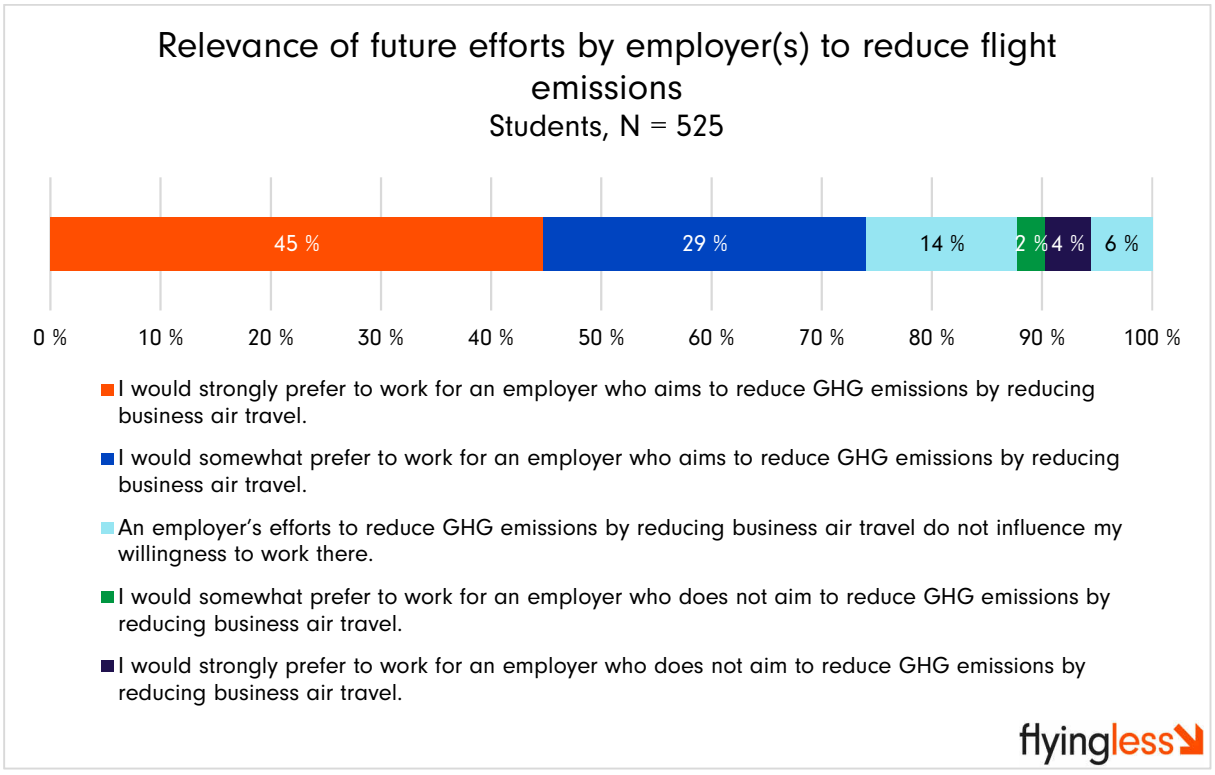

Figure 49: Relevance of future efforts by employer(s) to reduce GHG emissions by reducing business air travel. Status group: Students, N = 525. Relative frequency of the stated preferences regarding the employer.

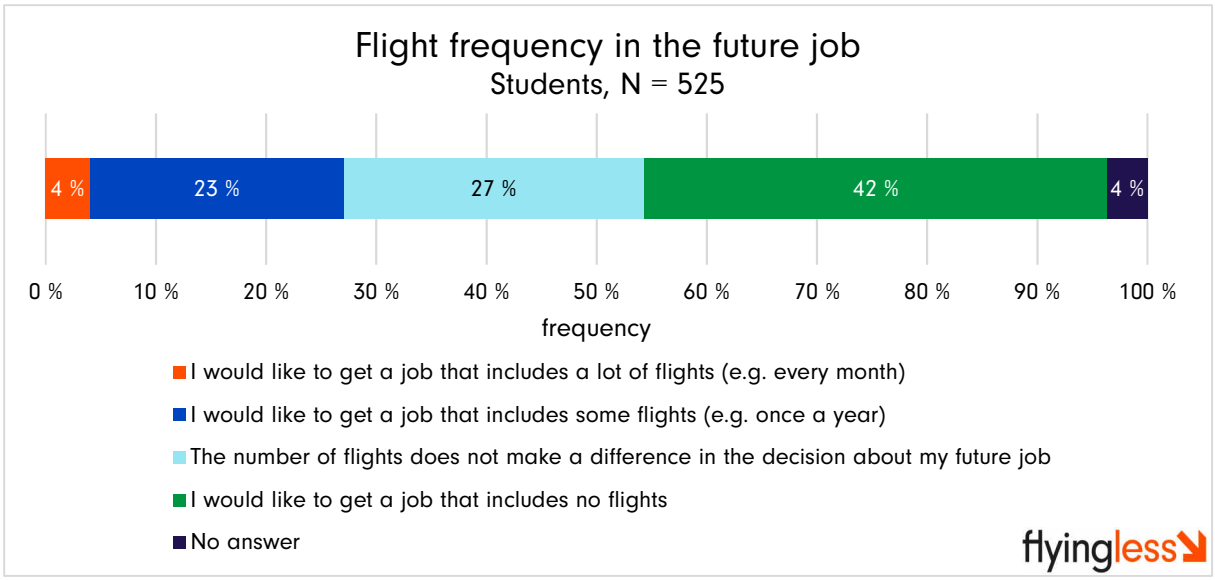

Figure 50: Flight frequency in the future job. Status group: Students, N = 525. Relative frequency of mentions for the number of air trips in the future workplace.

Authors

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Contributions and acknowledgements

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