

# Self-Reported Changes in Quality of Work as a Result of the COVID-19 Pandemic for Faculty Members in Physics and Astronomy

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Since the beginning of the COVID-19 pandemic, faculty members have faced a changed and challenging environment. They were faced with reallocating their time across various teaching, research, and service responsibilities; adjusting their teaching format, testing, and labs; and dealing with reduced access to the resources they needed to teach and/or conduct research, all while trying to maintain the quality of their work. In this Focus On, we present faculty member's self-reported changes in their quality of work as a result of the COVID-19 pandemic. During the spring semester of 2021, we surveyed a sample of physics and astronomy faculty members; most physics and astronomy faculty members reported the pandemic has had negative impacts on their overall quality of work, but the impact of the pandemic varied based on the work activity (e.g., teaching, mentoring, collecting data, publishing) and varied across faculty members.

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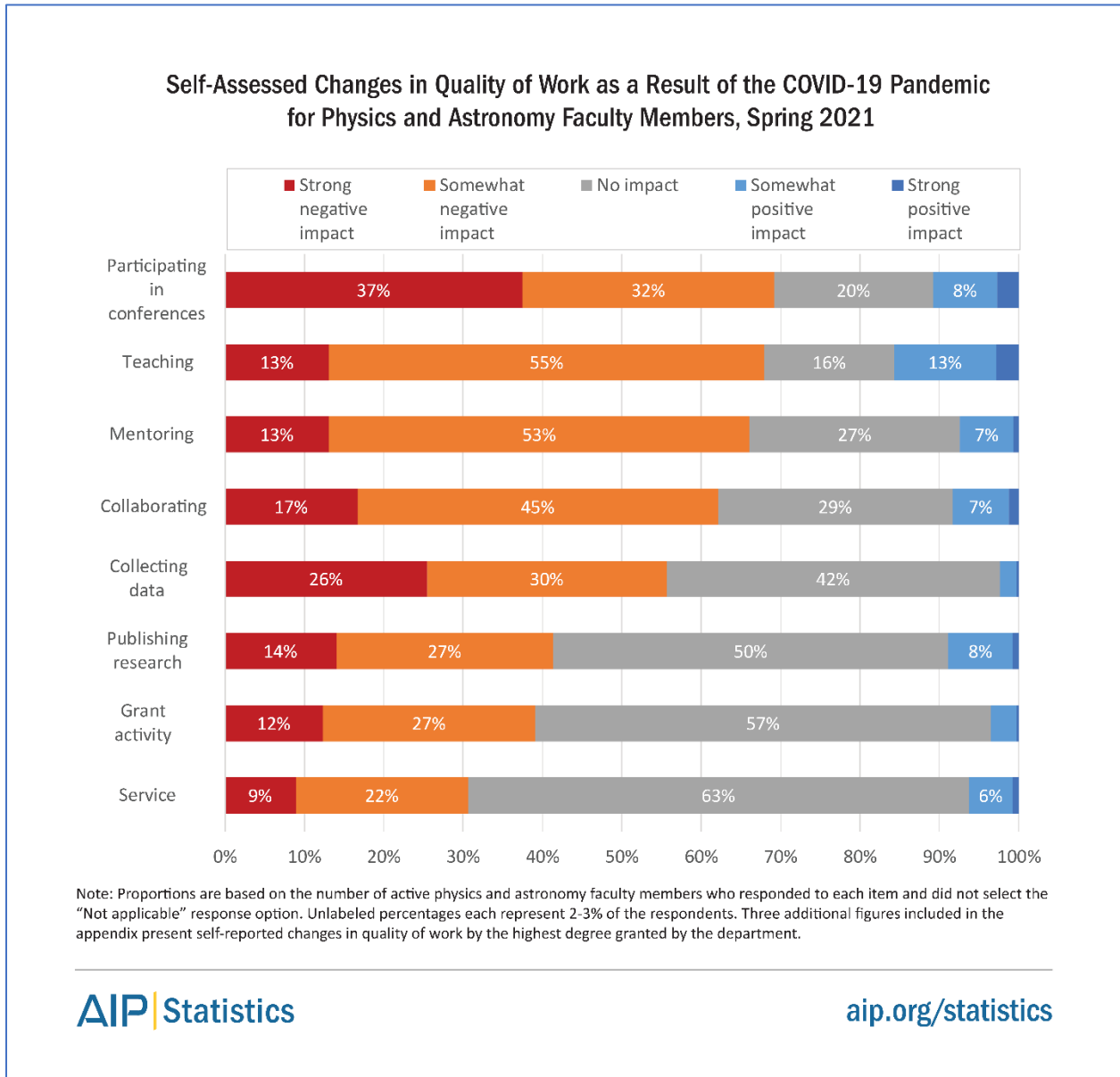
In the spring of 2021, 1,793 physics and astronomy faculty members across 286 US physics and/or astronomy departments shared how their work was affected by the COVID-19 pandemic. This report includes the 1,407 respondents who were employed as active faculty members in physics or astronomy when the survey was administered. We asked respondents, "How did COVID-19 and your institution's response to the pandemic affect the quality of your work in following areas?" to which faculty members responded using a 5-point Likert scale from "Strong negative impact" to "Strong positive impact," with the option to select "Not applicable" for each of the eight activities we assessed:

- Teaching
- Mentoring
- Collaborating
- Collecting data
- Publishing research *for example, writing, submitting, revising*
- Applying for, attaining, and/or using grant funding
- Participating in conferences *for example, preparation, attendance, presentation*
- Completing service to the field *for example, reviewing*

We chose the phrasing “quality of work” because it can reflect the confluence of the quality of one’s experience and the quality of the outcome.

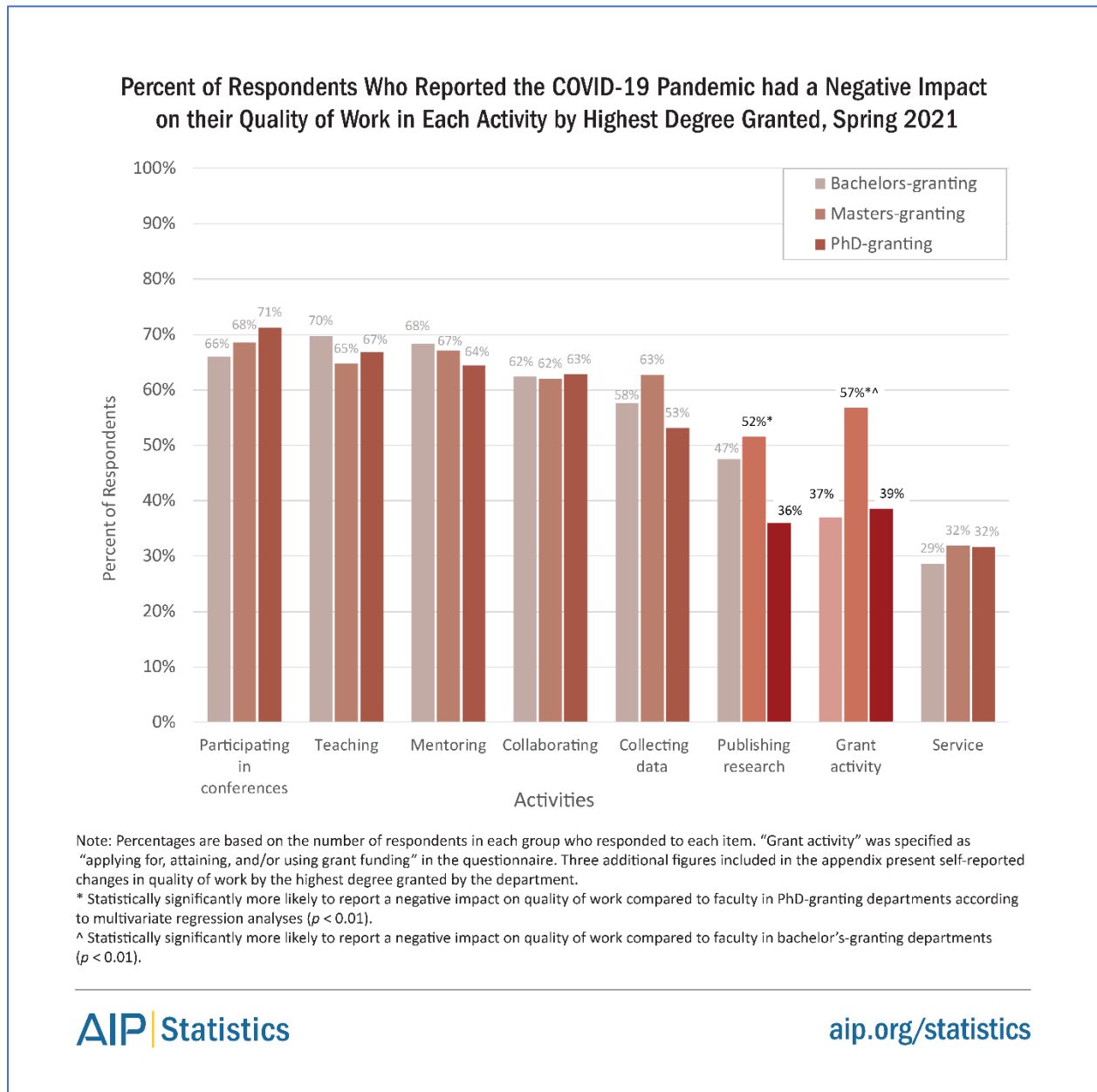
Most physics and astronomy faculty members reported negative impacts on their overall quality of work. The impact the pandemic had on faculty members’ perception of their quality of work varied by activity. For example, participating in conferences was seen as the most negatively affected while service activities were less affected (**Figure 1**). These trends were similar across all three department types, so we show the overall trend in Figure 1. We present self-reported changes in quality of work by highest degree granted in the department in the **appendix**.

Figure 1



Notable, however, there was also variability in faculty member experiences. In fact, 1 in 8 respondents (12%) reported that the pandemic positively impacted their overall quality work across the various work activities. Some of these differences seemed to be based on the highest degree granted by the department. Specifically, faculty members employed in master's degree-granting departments were more likely to report negative impacts on their publication activities compared to faculty in PhD-granting departments, and they were more likely to experience negative impacts on their grant activities compared to faculty in both bachelor's- and PhD-granting departments (**Figure 2**).

Figure 2



## Conclusions

In this Focus on, we presented faculty members' self-reported changes in quality of work. The majority of respondents reported that the pandemic had negative consequences for their overall quality of work. These results are in concert with other results from the Faculty Member Survey – faculty members reported reduced access resources (see [related AIP Focus On<sup>\[1\]</sup> here](#)), reallocating time across various responsibilities (see [related AIP Focus On<sup>\[2\]</sup> here](#)), adjusting courses to accommodate for remote or socially distanced environments, and struggling to balance their work and personal life (see [related AIP Focus On<sup>\[3\]</sup> here](#)). Additional analyses are needed to fully understand the connections among these experiences.

In this Focus on, we also described some of the variability faculty reported in their quality of work; however, there were more similarities than differences across department types. This suggests that differences in perceived changes in quality of work may also be related to other position or department characteristics (e.g., rank) in addition to faculty member identities (e.g., gender and racial or ethnic identities). In future reports, we will explore these potential differences in greater detail.

## **Survey Methodology**

The Faculty Member Survey is administered by the American Institute of Physics approximately every five years. The survey focuses on the demographics, training, and experiences of faculty members. In this cycle, the Statistical Research Center included a special section on the impact of the COVID-19 pandemic.

We asked 5,488 physics and astronomy faculty members across 315 US physics and/or astronomy departments to complete the Faculty Member Survey in the spring of 2021. The institutions were selected using cluster sampling; we randomly selected 39% of all US departments that offered degrees in physics, astronomy, or both physics and astronomy from 4-year colleges or universities, including both public and private institutions and oversampling Historically Black Colleges and Universities (HBCUs).

From each sampled department, we collected all faculty members' names and contact information from the department websites. All listed faculty members within those departments were emailed a link to complete the survey.

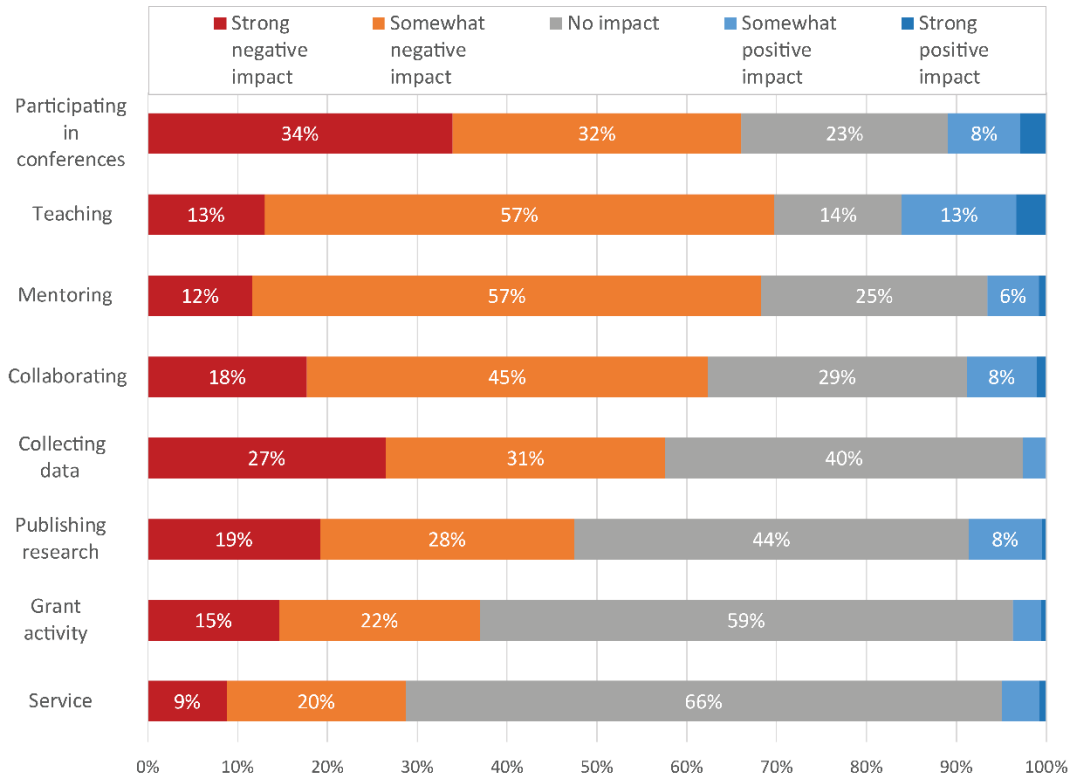
A total of 1,793 individuals from 286 departments responded to the questionnaire; however, a total of 1,407 respondents were included in this Focus On. Respondents who indicated they were not active faculty members or who were not currently working at the institution from which we collected their contact information were removed from the sample. Nearly half of active faculty members were full professors (45%), while fewer were associate professors (20%), assistant professors (17%), or in other faculty roles (15%).<sup>a</sup>

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<sup>a</sup> These numbers are similar to those collected in AIP's Academic Workforce survey, in which the chair from each physics and astronomy department in the US was asked to report the number and rank of all faculty members in the department. Therefore, we believe this sample is a good representation of the population of physics and astronomy faculty member ranks in the US.

**Figure 3. Bachelor's Degree-Granting Departments**

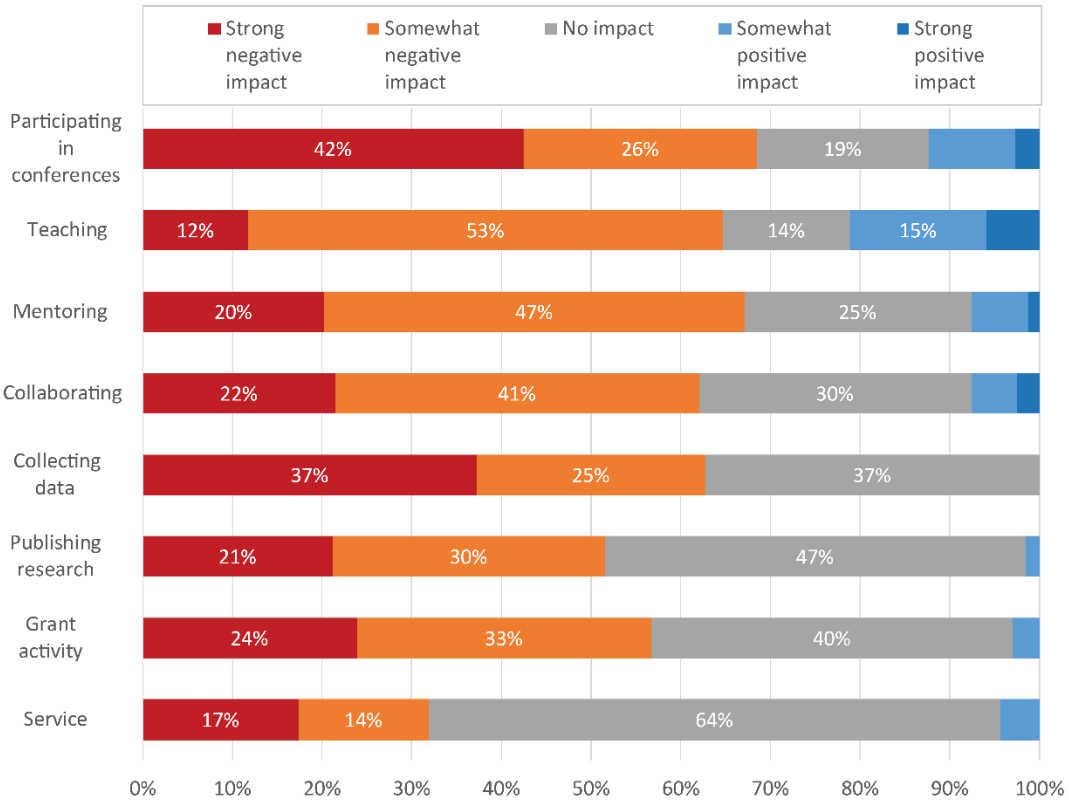
**Self-Assessed Changes in Quality of Work as a Result of the COVID-19 Pandemic for Physics and Astronomy Faculty Members in Bachelors-Granting Departments, Spring 2021**



Note: Proportions are based on the number of active physics and astronomy faculty members in bachelor's-granting departments who responded to each item and did not select the "Not applicable" response option. "Grant activity" was specified as "applying for, attaining, and/or using grant funding" in the questionnaire. Unlabeled proportions each represent < 5% of the respondents.

**Figure 4. Master’s Degree-Granting Departments**

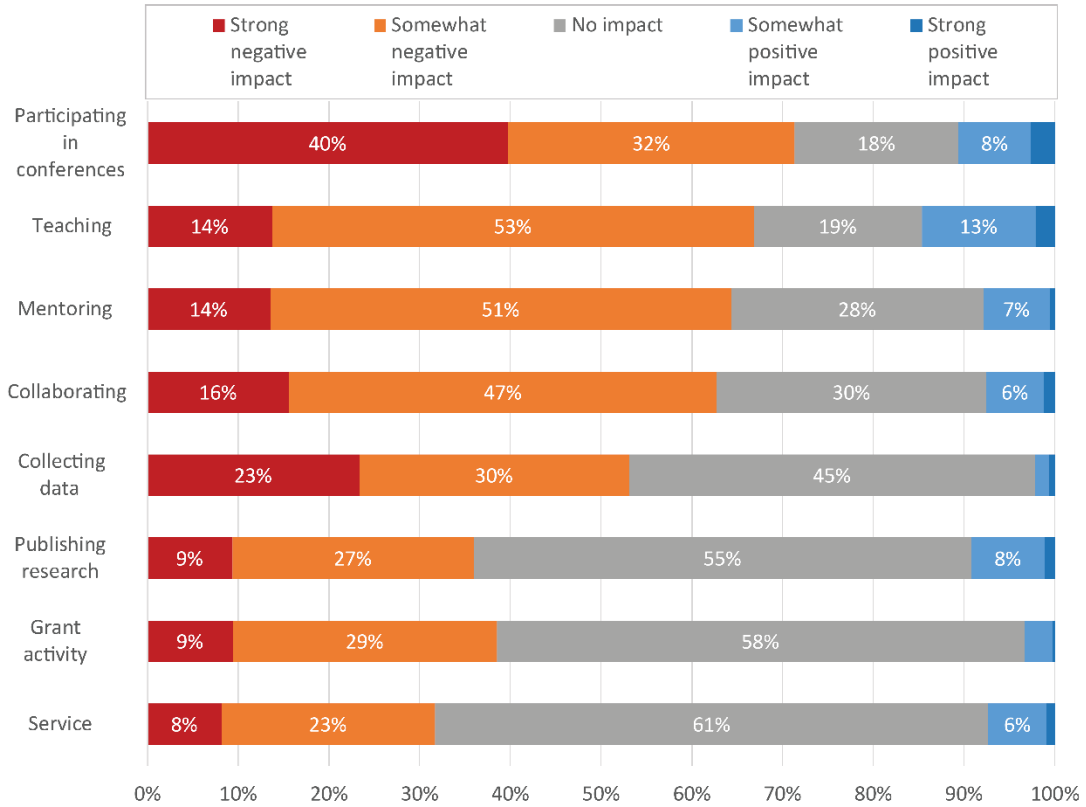
**Self-Assessed Changes in Quality of Work as a Result of the COVID-19 Pandemic for Physics and Astronomy Faculty Members in Masters-Granting Departments, Spring 2021**



Note: Proportions are based on the number of active physics and astronomy faculty members in master’s-granting departments who responded to each item and did not select the “Not applicable” response option. “Grant activity” was specified as “applying for, attaining, and/or using grant funding” in the questionnaire. Unlabeled proportions each represent < 11% of the respondents.

**Figure 5. PhD-Granting Departments**

**Self-Assessed Changes in Quality of Work as a Result of the COVID-19 Pandemic for Physics and Astronomy Faculty Members in PhD-Granting Departments, Spring 2021**



Note: Proportions are based on the number of active physics and astronomy faculty members in PhD-granting departments who responded to each item and did not select the "Not applicable" response option. "Grant activity" was specified as "applying for, attaining, and/or using grant funding" in the questionnaire. Unlabeled proportions each represent < 5% of the respondents.



## References

- [1] Walsh and Tyler (2021). Changes in Access to Resources During the COVID-19 Pandemic for Faculty Members in Physics and Astronomy. <https://www.aip.org/statistics/reports/covid-faculty-resources>
- [2] Walsh and Tyler (2021). Changes in Time Allocation During the COVID-19 Pandemic for Full-time Faculty Members in Physics and Astronomy. <https://www.aip.org/statistics/reports/changes-time-allocation-during-covid-19-pandemic-full-time-faculty>
- [3] Walsh and Tyler (2021). Physics and Astronomy Faculty Members' Well-Being During the COVID-19 Pandemic. <https://www.aip.org/statistics/reports/covid-faculty-wellbeing>

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