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Public Opinions of Unmanned Aerial Technologies in 2014 to 2019: A Technical and Descriptive Report

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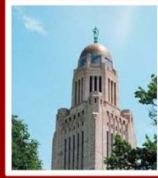
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PUBLIC OPINIONS OF UNMANNED AERIAL TECHNOLOGIES IN 2014 TO 2019: A TECHNICAL AND DESCRIPTIVE REPORT

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Executive Summary

The primary purpose of this report is to provide a descriptive and technical summary of the results from similar surveys administered in fall 2014 ($n = 576$), 2015 ($n = 301$), 2016 ($n_s = 1946$ and 2089), and 2018 ($n = 1050$) and summer 2019 ($n = 1300$). We provide some justification for our research design but do not provide a detailed literature review. Such reviews may be found in our other publications. The present results, however, may be referenced while additional dissemination routes (e.g., publications) continue to be pursued.

In order to explore a variety of factors that may impact public perceptions of unmanned aerial technologies (UATs), we conducted survey experiments over time. These experiments randomly varied the *terminology* (drone, aerial robot, unmanned aerial vehicle (UAV), unmanned aerial system (UAS)) used to describe the technology, the *purposes* of the technology (for economic, environmental, or security goals), the *actors* (public or private) using the technology, the technology's *autonomy* (fully autonomous, partially autonomous, no autonomy), and the *framing* (promotion or prevention) used to describe the technology's purpose.

Initially, samples were recruited through Amazon's Mechanical Turk, required to be Americans, and paid a small amount for participation. In 2016 we also examined a nationally representative samples recruited from Qualtrics panels. After 2016 we only used nationally representative samples from Qualtrics. Major findings are reported below with more details regarding the research methods and analyses presented in the full report.

MTurk vs. Qualtrics Sample Differences in 2016

In 2016 the same survey experiment was conducted with both MTurk and Qualtrics participants. MTurk workers are a convenience sample while the Qualtrics samples came from panels and were recruited to be representative of the national U.S. population. Given these differences, it was expected that the samples would differ in demographics. Indeed, the Qualtrics sample had fewer whites and more minority racial/ethnic representation, were older on average, and more likely to report being pilots, and more conservative on average than the MTurk sample.

Differences between the samples on key study variables in 2016 indicated MTurk participants were more likely to say they had heard of the technologies, yet gave, on average, a longer estimated time horizon before the technologies would be used as described in the scenarios. The MTurk sample also trusted the regulators of the technologies to a greater extent than the Qualtrics sample. Meanwhile, the Qualtrics sample reported significantly higher subjective knowledge of the technologies.

Demographic Effects

Examination of simple associations between demographics and our main dependent variables (ratings of support, trust, familiarity) found very few significant relationships.

- Gender was related to support for the technologies, such that men were more supportive than women especially when the technologies were referred to in the surveys as UASs or UAVs as opposed to drones or aerial robots.
- Age was positively correlated with trust in the actors using the technologies.

Open-Ended Listing of Hopes and Concerns

Participants identified their hopes and concerns about drone technology in open-ended comments in the surveys administered 2014-2018. The research team analyzed the comments from the representative Qualtrics 2016 sample to identify common themes, as well as how hopes and concerns differed by demographics and use of different terminology in the surveys.

The most common concerns were about privacy and safety, including safety due to accidents or due to security concerns. Technical concerns and concerns about moral misuse were also mentioned often. People were concerned that the technologies could malfunction or, for example, that autonomous technologies may have limitations compared to human-controlled devices. Meanwhile, the most common hopes were related to improving services through increased efficiency or delivery, and improved safety, such as by keeping pilots out of dangerous situations. Another often-mentioned hope was related to use by and for military and law enforcement. Concerns mentioned less often included concerns about hacking or hijacking of the technologies and economic impacts (e.g., loss of jobs, cost of technologies). Hopes mentioned less often included use of the technologies for fun and recreation and use of the technologies to improve human control and reduce errors or accidents.

There were some differences in open-ended responses by demographic factors. For example, participants identifying as female were more likely to list concerns about reliability, economic impact, and the autonomy of the technology; whereas those who identified as male were more likely to list concerns about misuse or to say that they had no concerns. Males were more likely to list hopes for the use of the technologies for research, while females were more likely to say they had no hopes for the technologies or that they did not know what positive effects the technologies could bring. Additionally, participants who listed concerns about accidents, misuse, privacy, and air traffic were on average older than those who did not list these concerns. Meanwhile, those listing concerns about reliability, hijacking, economics, and autonomy tended to be younger on average. Those listing hopes for emergency medical use, military use, and environmental research tended to be older than those who did not list these hopes; those listing hopes for increased technical control were younger on average. There were also some differences by political party and ideology. Participants listing concerns about privacy

and air traffic as well as hopes for military use, on average, reported more identification with the Republican political party. Meanwhile, participants who listed hopes for environmental research, and concerns in the “other” and “reliability” categories, tended to lean, on average, more toward the liberal end of the scale representing self-reported ideology.

Listing of various hopes and concerns also varied depending on the term used for the technology in the survey. For example, those receiving the version of the survey referring to the technologies as “drones” were among the most likely to list concerns pertaining to misuse, privacy, and air traffic, and to list hopes pertaining to law/military use and service uses. However, the “drone” term appeared less likely to elicit concerns about reliability, hijacking, or autonomy, or hopes pertaining to increased technical control. Those receiving the survey using the term “aerial robot” were most likely to list hopes pertaining to emergency medical use. Those receiving the surveys using the terms “UAV” and “UAS” were among the most likely to list hijacking concerns and hopes for increases in safety (e.g., of pilots).

Main and Conditional Effects of Time

The surveys were administered in 2014, 2015, 2016, 2018, and 2019. We examined the effects of time (year) on our primary dependent variables: support for UATs and perceived trustworthiness of (a) the actors using the UATs (all years), (b) the UATs themselves, and (c) those regulating the UATs (measured only in later years of the survey). In addition, we examined effects on public perceptions of the time horizon for different uses of UATs and, relating to terminology, we also assessed awareness of UATs (whether they “had heard of” the technology). Tests of the effects of time (year) were conducted while controlling for demographics (race, age, gender, overall political ideology), source of the sample (MTurk vs. Qualtrics), and all experimental conditions (main effects only). These analyses revealed a number of significant main or conditional effects on our dependent variables.

- Year of survey was positively predictive of increased trust (in actors, regulators, and UATs) but not overall support for the technologies.
 - Although support overall did not increase, there was slight evidence that support for security purposes (the least supported purpose) may have increased over time.
 - In addition, there appeared to be a slight increase in support over time when the term drone was used instead of other terminology.
- Overall, year did not appear to predict subjective knowledge of the technologies.
- Year negatively predicted objective knowledge of the technologies; later samples demonstrated less knowledge of key facts than earlier samples.
- Year positively predicted having heard of the technologies, suggesting the public is becoming more aware of the technologies.

- However, further analysis found this positive effect was only statistically significant when the term “drone” or “aerial robot” was used, and not significant when UAV or UAS terms were used in the survey.
- Counterintuitively, year positively predicted a longer estimation of time until the technologies would be used as depicted in the scenarios.
 - Additional analyses found that this effect depended upon terminology and when the more familiar term “drone” was used there was no effect of year on time horizon for use.
 - Also, there was a slight tendency for year to be more strongly associated with increased “how long” estimates in the prevention-framed conditions compared to the promotion-framed conditions.

Main Effects of Experimentally Varied Factors

Main effects of each of our experimentally varied factors were tested in the context of the same regression equation used to test for the effects of time. That is, once again, the model controlled for demographics (race, age, gender, overall political ideology), source of the sample (MTurk vs. Qualtrics), all other experimental conditions (main effects only), and the effect of time.

Terminology. In addition to predicting various hopes and concerns that people might list (as reported earlier), terminology used to describe UATs had statistically significant effects on a number of our dependent variables.

- Terminology had a small effect on support for the technologies, accounting for .2% of variance overall, and .1 to 1.6% of variance in individual samples. The term “drone” was associated with most support, and “UAV” and “UAS” the least support.
- Terminology appeared to be unrelated to each of the trust variables assessed.
- Terminology was most strongly related to familiarity of the technology.
 - Terminology had a very large effect on reports of “having heard of” the technology, accounting for more than 20% of the variance in each sample. People most often indicated having heard of “drones.” The second most recognized term was “unmanned aerial vehicles” or “UAVs.”
 - Respondents indicated greatest subjective knowledge, and also showed the greatest objective knowledge, when the term “drone” was used in the surveys.
 - Terminology had a small effect on participant estimates of how long it would be before the technologies might be used as described in the scenarios, with the term “drone” resulting in the shortest time frame estimates.

Purposes. Use of the UATs for different purposes was related to a number of our dependent variables.

- Purpose had its strongest effect on support for technology, accounting for nearly 7% of independent variance in our regression equations (which included the control variables, as described earlier). Participants reported the greatest support for weather purposes (used in 2019 only) and environmental purposes, followed by economic, and then security purposes.
- Purpose related to the trust variables similarly to how it related to support, resulting in the greatest reports of trust (in UATs, regulators, and users) when the purposes were environmental or weather related, and least when the uses were security related. When it came to trust, purpose accounted for the most independent variance in trust in actors and regulators, and the least variance in trust in UATs.
- Purpose also predicted estimates of how long it would be before the technologies would be used in a certain manner, with economic purposes typically resulting in the longest time horizons for use and weather/environment uses resulting in the shortest time horizons.
- Purpose did not predict subjective or objective knowledge.

Actors. Relating to actors (government or businesses) using the UATs, actor only had an impact on trust and support variables and not the awareness variables (subjective knowledge, objective knowledge, and time horizon for use).

- Overall, use of UATs by the government was supported to a greater extent than use by private companies.
- Counterintuitively, trust in actors and regulators was rated slightly higher for the scenarios in which a private company was using the technologies rather than a governmental entity.

Autonomy. Autonomy of the UAT was related to support, trust in actors and regulators, but not trust in the technologies themselves. Autonomy also predicted the estimated time horizon for use of the UATs. More specifically:

- Autonomy had slight effects on support, trust in the actors using the technology, and trust in the regulators regulating the technology, such that use of manual UATs tended to be least supported and to garner the least trust.
- Manual UATs also resulted in participants giving ratings reflecting they expected a longer time horizon before the technologies would be used as described in the scenario.

Framing. Finally, overall, framing of the UAT purposes also appeared to slightly affect support and trust. Specifically:

- Prevention-focused descriptions of UAT purposes resulted in slightly more support and trust in actors, regulators, and UATs than promotion-focused descriptions.

- Framing did not have any consistent statistically significant impacts on subjective or objective knowledge or estimated time horizon for use of the technologies.

Impacts of Trustworthiness Perceptions on Support for the Technologies

Building on prior trust research, we also investigated the relationships between perceptions of the trustworthiness (of the actors using UATs, the regulators creating policies for UAT use, and the UATs themselves) and support for UATs. Specifically, we examined the effects of the trustworthiness variables in the context of a hierarchical regression in which the control variables were entered in step 1, the experimentally varied factors entered in step 2, and the trustworthiness variables entered in step 3.

Findings indicated that perceptions of trustworthiness accounted for approximately 32% of independent variance in UAT support, with all three trustworthiness variables accounting for significant independent variance. Perceptions of the trustworthiness of the technologies accounted for the most independent variance, followed by perceptions of the trustworthiness of the actors using the technologies, and then the trustworthiness of regulators.

Conclusions and Implications

Public acceptance of new technologies can have large effects on the integration of those new technologies into society. The present study aimed to begin to explore factors that impact public attitudes toward unmanned aerial technologies (most commonly known as “drones”), a currently rapidly developing set of new technologies. Our studies replicated and extended prior studies examining public perceptions of these technologies. For example, prior work has commonly found the purpose of drones to affect public acceptance (e.g., Monmouth University, 2013; Walther, PytlikZillig, Detweiler, & Houston, 2019), consistent with our findings. Prior comparisons of use of different terminology typically has found little to no effects of different terminology on risk perceptions related to unmanned aerial technologies (Clothier, Greer, Greer, & Mehta, 2015; PytlikZillig, Duncan, Elbaum, & Detweiler, 2018). Similarly, our study found no effects of terminology on trustworthiness perceptions. Our study, however, finds a large effect of terminology on familiarity/awareness of the technologies, as well as effects on the hopes and concerns that come to mind when the technologies are described, and some very small but relatively consistent effects of terminology on support for the technologies.

Other findings include only small impacts of demographics, except for slightly greater acceptance among men than women. Effects of the passage of time between 2014 and 2019, and of the different actors using the technologies, also appeared to be small, and may require further study. While autonomy of the technology did not have large effects, there was some evidence that the public’s current understanding of technology autonomy creates a preference for use of that autonomy rather than reliance upon complete manual control. Finally, the largest effects on support for the technologies were achieved by the trustworthiness variables.

Public Opinions of Unmanned Aerial Technologies, 2014-2019: A Technical and Descriptive Report

Background

The present study was conducted to expand the literature pertaining to U.S. public perceptions of unmanned aerial technologies² (UATs, most commonly known as “drones,” e.g., Aydin (2019)) and in order to provide information for engineers and researchers designing UATs for various purposes and to generally advance understanding of public views of these technologies and whether and how those attitudes may or may not vary across certain condition or be changing over time.

In our surveys, we examined questions potentially of interest to both social scientists and engineers. For example, engineers often use a variety of **terminology** to describe their technologies (Legere, 2019), with little empirical information to substantiate or refute their intuitions about whether that terminology has positive or negative effects on public attitudes (see Clothier et al., 2015, for an exception). In addition, engineers working to design and develop UATs have made great strides in advancing **autonomous control** of UATs for different purposes. Many (engineers and others) are aware of the controversy around autonomy of UATs used in military contexts (Wilson, 2014), but there is a lack of research on public attitudes toward UAT autonomy in other contexts.

Our team also sought to investigate the extent to which public attitudes are dependent upon **purposes** or **users** of the UATs. Building on prior research findings (e.g., Monmouth University, 2013), we suspected that certain purposes and users of UATs may be viewed as more noble or socially beneficial and that some actors may be viewed as more trustworthy, at least by some segments of the population (e.g., by liberals or conservatives). We thus explored whether these factors external to the UAT *per se* could importantly influence attitudes toward the technologies.

From a social science perspective, our collaborative team also was interested in the extent to which public attitudes might be malleable through choices relating to **communicative framing**. Such malleability may indicate people are still making up their minds about the technologies. If attitudes become less malleable by framing over time, it could indicate that attitudes are becoming more informed and stable (Igou & Bless, 2007).

² Our studies varied the terminology describing the technologies. To make it clear when we are referencing the technologies regardless of how they were termed, here we call them unmanned aerial technologies (UATs).

Methods

Participants

Overview. We discuss the findings from multiple national samples—Amazon’s Mechanical Turk (MTurk) American workers were surveyed three times between 2014 and 2016 and additional national and representative samples from Qualtrics panels were surveyed three times between 2016 and 2019. Due to the paid nature of the surveys, and in some cases use of online software (Qualtrics) set to prompt or require responses for skipped items, the data has very minimal missing data. Beginning in 2016 we also added some data quality checks (two items explicitly asking participants to choose a specific item) which, in 2016, resulted in the termination of approximately 979 (32% of the total included $n=2089$ + quality check terminates $n=979$) of the Qualtrics sample participants during data collection, and the dropping of about 2% of the MTurk sample after data collection. In 2018 and 2019, the quality check questions resulted in the dropping of 942 (47%) and 669 (34%) of the Qualtrics participants respectively.

Samples. Below we describe each of the samples generally. Please see the “Sample comparisons” section under “Results” for more detail on the similarities and differences between the samples on the measured independent and dependent variables.

Sample 1 (MTurk 2014). Participants were recruited from Amazon’s Mechanical Turk (MTurk) in the last half of 2014. Constraints were set in MTurk such that only American participants were eligible to participate. The data set initially contained 671 lines of data. However, 68 (10%) participants visited but did none of the survey, 25 (4%) participants repeated the survey and only their first response was retained, and two additional responses—although complete—were invalid (inspection of the data revealed a ‘click through’ pattern in which the same response was chosen for all closed-ended questions and nonsense words were entered for open-ended responses). Consistent with the lower rates typical of the early days of MTurk, participants were awarded 25 cents (\$USD) for completing the survey.

The final sample included 576 participants. Average time spent on the survey was about 7.50 minutes ($SD = 4.65$ minutes), with the range from about 1 minute to 47 minutes. When maximum time was set to a reasonable maximum of 20 minutes the mean was 7.36 minutes ($SD = 3.95$ minutes). Of the 576 participants, 84% identified as white, 11.1% as Spanish, Hispanic, or Latino, 10.4% as Black or African American, 6.6% as Asian, 2.3% as American Indian or Alaska Native, 0.5% as Native Hawaiian or Pacific Islander. A total of 299 participants were male (51.9%) and 277 were female (48.1%). The ages of participants ranged from 18 to 75, with 36 years being the average age ($SD = 12.76$). Regarding the sample’s political views, they tended to lean slightly toward the Democrat/Liberal end of the continuum (see **Table 1**).

Sample 2 (MTurk 2015). Participants were recruited from Amazon’s Mechanical Turk (MTurk) approximately one year after Sample 1, in early of September 2015. Constraints were set in MTurk such that only American participants were eligible to participate. A total of 315 persons visited the survey, and 14 (4%) participants did not complete the survey. Participants were awarded 50 cents (\$USD) for completing the survey because it was determined that the prior year participants were paid less than average for typical MTurk survey work.

The final sample included a total of 301 participants. Average time spent on the survey was about 8.21 minutes (SD = 9.65 minutes), with a range of 1 to 143 minutes. When maximum time was set to 20 minutes the mean was 7.44 minutes (SD = 4.14 minutes). Of the 301 participants, 87% identified as white, 9.6% as Spanish, Hispanic, or Latino, 8.6% as Black or African American, 6.3% as Asian, 1.0% as American Indian or Alaska Native, 0.7% as Native Hawaiian or Pacific Islander. A total of 134 participants were male (44.5%) and 167 were female (55.5%). The ages of participants ranged from 18 to 69, with 36.6 years being the average age (SD = 12.32). Regarding the sample’s political views, they tended, again, to lean toward the Democrat/Liberal end of the continuum (see **Table 1**).

Sample 3 (MTurk 2016). Participants were recruited from Amazon’s Mechanical Turk (MTurk) approximately one year after Sample 2, in the first half of October 2016. Constraints were set in MTurk such that only American participants were eligible to participate. A total of 2152 visits to the survey were recorded, and 206 (10%) visits did not result in completed surveys. The survey for samples 3 and 4 (in 2016) was a bit longer than in 2014 and 2015, and payment for MTurk work had risen, so participants were awarded one dollar (\$1 USD) for completing the survey.

The final sample included a total of 1946 participants. Average time spent on the survey was about 12.02 minutes (SD = 6.93 minutes), with a range of about 1 to 62 minutes. When maximum time was set to 20 minutes the mean was 11.23 minutes (SD = 4.64 minutes). Of the 1946 participants, 81% identified as white, 5.4% as Spanish, Hispanic, or Latino, 8.4% as Black or African American, 8.2% as Asian, 1.4% as American Indian or Alaska Native, 0.3% as Native Hawaiian or Pacific Islander. A total of 928 participants were male (47.7%) and 1018 were female (52.3%). The ages of participants ranged from 18 to 79, with 36.0 being the average age (SD = 11.68). Regarding the sample’s political views, they tended, again, to lean toward the Democrat/Liberal end of the continuum (see **Table 1**).

Sample 4 (Qualtrics 2016). Participants were recruited from Qualtrics Panels at approximately the same time as Sample 3, in the first half of October 2016. Qualtrics recruited a nationally representative sample from its panels. According to Qualtrics records, a total of 10,940 respondents reacted to the Qualtrics survey request. Of these 8,633 passed the basic demographic pre-screen questions and 7,969 then went into the survey itself. Of those entering the survey, 2,089 completed the survey and were included in the sample. Of the remaining, there

were 1,041 survey terminates—with 46 not meeting age/consent requirements, 789 terminated by failing to pass the first attention check, 190 failing to pass the second attention check, and 16 terminated due to speeding through the survey (spending less than one-third of the median response time based on soft-launch data). The remaining 4,839 were omitted from the dataset because they dropped out of the survey on their own or represented over quota data points. Note that Qualtrics samples strategically to fill the more difficult quotas before opening targeting to the easier-to-fill groups. Thus, Qualtrics first recruited Hispanics and then recruited respondents for the other minority quotas. Next, they recruited white males; when that quota was full they recruited white females for all open age quotas. Qualtrics offers its own incentive system for survey completes based on the length of the survey.

The final sample included a total of 2089 participants. Average time spent on the survey by Qualtrics survey respondents was about 16.61 minutes (SD = 19.12 minutes), with a range of about 2 to 371 minutes. When maximum time was set to 20 minutes the mean was 12.92 minutes (SD = 5.08 minutes). Of the 2089 participants, 72% identified as white, 22.5% as Spanish, Hispanic, or Latino, 13.1% as Black or African American, 5.6% as Asian, 1.2% as American Indian or Alaska Native, 0.4% as Native Hawaiian or Pacific Islander. A total of 1001 participants were male (47.9%) and 1088 were female (52.1%). The ages of participants ranged from 18 to 96, with 46.4 being the average age (SD = 16.47). Regarding the sample's political views, although they were more conservative and republican than the MTurk samples, they tended, again, to lean toward the Democrat end of the continuum, as shown in **Table 1**. Self-reported ideology, however, leaned slightly conservative, especially relating to economic views.

Sample 5 (Qualtrics 2018). Participants were recruited from Qualtrics Panels in late November of 2018. As was the case for Sample 4, Qualtrics strategically recruited a nationally representative sample from its panels, and provided incentives for survey completion. According to Qualtrics records, a total of 5,208 respondents reacted to the Qualtrics survey request. Of these 3,546 passed the basic demographic pre-screen questions and 2,724 then went into the survey itself. Of those entering the survey, 1,050 completed the survey and were included in the final sample. Of those not included, there were 1,083 survey terminates—with 76 not meeting age/consent requirements, 756 terminated by failing to pass the first attention check, 186 failing to pass the second attention check, and 65 terminated due to speeding through the survey (spending less than one-half of the median response time based on soft-launch data). The remaining 591 were omitted from the dataset because they dropped out of the survey on their own or represented over quota data points.

The final sample included 1050 participants. Average time spent on the survey was about 16.32 minutes (SD = 25.70 minutes), with a range of about 3 to 458 minutes. When maximum time was set to 20 minutes the mean was 12.93 minutes (SD = 4.77 minutes). Of the 1050 participants, 68.3% identified as white, 22.7% as Spanish, Hispanic, or Latino, 14.8% as Black or African American, 6.2% as Asian, 2.9% as American Indian or Alaska Native, 0.3% as Native

Hawaiian or Pacific Islander. A total of 504 participants were male (48.0%) and 546 were female (52.0%). The ages of participants ranged from 18 to 85, with 46.5 being the average age (SD = 16.62). Regarding the sample’s political views, again they were a bit more conservative and republican than the MTurk samples, but tended, again, to lean toward the Democrat end of the continuum, as shown in **Table 1**. Self-reported ideology again leaned slightly conservative, especially relating to economic views.

Sample 6 (Qualtrics 2019). Participants were recruited from Qualtrics Panels in late June of 2019. Again, Qualtrics strategically recruited a nationally representative sample from its panels and provided incentives for survey completion. According to Qualtrics records, a total of 2418 respondents reacted to the Qualtrics survey request and passed the basic demographic pre-screen questions and went into the survey itself. Of those entering the survey, 1300 completed the survey and were included in the final sample. Of those not included, there were 712 survey terminations—with 32 not meeting age/consent requirements, 497 terminated by failing to pass the first attention check, 172 failing to pass the second attention check, and 11 terminated due to speeding through the survey (spending less than one-half of the median response time based on soft-launch data). The remaining 406 were omitted from the dataset because they dropped out of the survey on their own or represented over quota data points.

The final sample included 1300 participants. Average time spent on the survey was about 14.04 minutes (SD = 9.90 minutes), with a range of about 3 to 114 minutes. When maximum time was set to 20 minutes the mean was 12.22 minutes (SD = 4.79 minutes). Of the 1300 participants, 70.7% identified as white, 17.1% as Spanish, Hispanic, or Latino, 14.1% as Black or African American, 6.0% as Asian, 1.5% as American Indian or Alaska Native, 0.4% as Native Hawaiian or Pacific Islander. A total of 624 participants were male (48.0%) and 676 were female (52.0%). The ages of participants ranged from 18 to 86, with 46.8 being the average age (SD = 16.47). Again, this sample’s political views appeared roughly similar to the other Qualtrics samples.

Table 1. Political Leanings of Each Sample

Political party	Democrat (1-3)	Independent/Other (4)	Republican (5-7)	M	SD
Sample 1 (MTurk, 2014)	44.6%	31.9%	23.4%	3.56	1.61
Sample 2 (MTurk, 2015)	45.5%	30.6%	23.9%	3.49	1.64
Sample 3 (MTurk, 2016)	43.2%	31.3%	25.5%	3.60	1.59
Sample 4 (Qualtrics, 2016)	40.9%	30.6%	28.5%	3.72	1.78
Sample 5 (Qualtrics, 2018)	41.1%	29.4%	29.4%	3.74	1.91
Sample 6 (Qualtrics, 2019)	41.3%	27.0%	31.7%	3.86	1.95
Total	42.1	30.1	27.8	3.69	1.77

Ideology	Liberal (1-3)	Centrist/Middle of the road (4)	Conservative (5-7)	M	SD
Overall ideology					
Sample 1 (MTurk, 2014)	44.9%	27.5%	27.7%	3.63	1.74
Sample 2 (MTurk, 2015)	48.8%	24.3%	26.9%	3.49	1.81
Sample 3 (MTurk, 2016)	46.2%	26.2%	27.6%	3.55	1.75
Sample 4 (Qualtrics, 2016)	31.6%	32.6%	35.8%	4.08	1.81
Sample 5 (Qualtrics, 2018)	31.6%	34.1%	34.3%	4.01	1.83
Sample 6 (Qualtrics, 2019)	33.9%	28.8%	37.2%	4.07	1.88
Total	37.7%	29.7%	32.6%	3.87	1.82
Economic ideology					
Sample 1 (MTurk, 2014)	38.4%	22.9%	38.7%	3.99	1.78
Sample 2 (MTurk, 2015)	43.5%	16.3%	40.2%	3.87	1.94
Sample 3 (MTurk, 2016)	39.2%	20.5%	40.3%	3.96	1.86
Sample 4 (Qualtrics, 2016)	27.8%	28.8%	43.4%	4.36	1.82
Sample 5 (Qualtrics, 2018)	28.7%	29.7%	41.6%	4.24	1.83
Sample 6 (Qualtrics, 2019)	29.7%	26.5%	43.8%	4.31	1.89
Total	32.8%	25.3%	41.9%	4.18	1.85
Social ideology					
Sample 1 (MTurk, 2014)	54.7%	18.9%	26.4%	3.34	1.87
Sample 2 (MTurk, 2015)	60.1%	15.0%	24.9%	3.16	1.84
Sample 3 (MTurk, 2016)	59.2%	16.9%	23.8%	3.16	1.84
Sample 4 (Qualtrics, 2016)	37.8%	26.4%	35.8%	3.91	1.94
Sample 5 (Qualtrics, 2018)	38.2%	26.9%	35.0%	3.86	1.94
Sample 6 (Qualtrics, 2019)	38.9%	25.2%	35.9%	3.93	1.97
Total	46.1%	22.6%	31.3%	3.63	1.94

Notes. Scales ranged from strong Democrat (1) to strong Republican (7) and strong Liberal (1) to strong Conservative (7). Ns were as follows: Sample 1 N = 575-576 (one person did not answer overall political ideology item), Sample 2 N = 301, Sample 3 N = 1946, Sample 4 N = 2089, Sample 5 N = 1050, Sample 6 N = 1300.

Survey Procedures

The full text of the three surveys (v1 in 2014 and 2015; v2 in 2016 and 2018; and v3 in 2019) are given in Appendix A to this report. Unless otherwise specified, described measures and procedures were the same across all samples.

All surveys began with a consent form describing the study and participant rights. Next, the survey asked participants if they had ever heard of the technology (variously described, e.g., as a drone, unmanned aerial system, etc. see “Manipulations and Measures” section). In 2014-2018,³ if they had heard of the technology, they were next asked what they knew about it, with

³ Red text is used to identify years of the survey where some aspect of the measure was changed, to make those changes easier to find in the text.

an open-ended text box presented for them to type their responses. This request for an open-ended response was not used in the 2019 survey.

Next, to ensure all participants had some idea of what the technology was, a brief definition described the technology (regardless of term used for the technology) as

“an aircraft without a human pilot aboard. Its flight is controlled either autonomously by onboard computers or by the remote control of a pilot on the ground or in another vehicle.”

In 2014-2018, following this definition, participants were asked to report one or two concerns and one or two hopes that come to mind when they think of the technologies. Once again, open-ended text boxes were provided for them to type their responses. In 2019, participants were instead asked to rate some closed-ended questions relating to their attitudes toward UATs generally.

Participants were next provided with a scenario depicting an agency as investigating possible future uses of UATs. Participants were randomly assigned to a scenario in which key features were experimentally manipulated. After reading the scenario, participants were asked a series of questions pertaining to how they felt about this scenario, how soon they thought the technologies might be used in this way, whether they supported or resisted the use of the technologies for that purpose, and the trustworthiness of the actors using the technology (see measures for items/scales). In the 2016, 2018, and 2019 surveys, in addition to rating the trustworthiness of the actors using the technology, participants were also asked to rate the trustworthiness of the technology itself and of those regulating the technology.

Following the scenario, participants were asked to answer some questions about themselves, which included questions about their beliefs and motivations, age, gender, race/ethnicity, political party, and ideology. Beginning in 2016, their subjective and objective knowledge of unmanned aerial technology was also assessed.

In 2019 the survey was revised to add a fourth purpose condition: UATs used for weather forecasting purposes. In addition, we added two additional values items pertaining to advancing science and addressing climate change. Because we now had five similar values items, we underlined the values that were under investigation to make it obvious how those items differed from one another. The values items were then administered separately from the questions concerning promotion and prevention focus. We also added an additional relevant subjective knowledge question item pertaining to knowledge regarding how UATs are used by scientists. Finally, to increase the salience of our experimental conditions, we also added three reading check questions (assessing awareness of who was using the technology, what the technology was being used for, and the level of autonomy of the technology) immediately after the scenario. The participants were encouraged to correct each reading check question they got wrong if they got

any wrong. All participants were given correct answers to the reading check questions prior to moving forward on the survey.

Manipulations and Measures

Manipulated independent variables. The same study design and measures were used in 2014 and 2015, with some revisions between 2015 and 2016, and again between 2018 and 2019 (2016 and 2018 surveys were the same). Across all of the surveys, we manipulated five different factors in our short scenario descriptions. These manipulations were orthogonal—that is, random assignment of each factor was conducted independently. While this design resulted in a large number of unique cells ($4 \times 2 \times 3 \times 3 \times 2 = 144$ cells for 2014-2018, and with the addition of the weather science condition, $4 \times 2 \times 4 \times 3 \times 2 = 192$ cells in 2019), our primary interest was not to compare individual cells, but rather to test for main effects of each factor, and a set of specific interactions selected to test specific research questions. The detection of such effects in our design would indicate that the effect was strong enough to be detected despite variability introduced by varying other conditions.

Term (four conditions). Participants were randomly assigned to one of the following four terms labeling the technology: drone, unmanned aerial vehicle (UAV), unmanned aerial system (UAS), or aerial robot. The assigned term was used, not just in the scenario, but also consistently throughout the survey questions to describe the technologies. For example, when asking how long it would be before the technology would be used in the manner depicted by the scenario, the technology was referenced by the experimentally assigned term.

Actor (two conditions). Participants were provided with a scenario in which an actor is investigating possible future uses of UATs. Participants were randomly assigned to read about either “a private U.S. company” or “the U.S. government” as the actors using the UATs. Depending upon the purpose of the UAT, the specific entity was given a different specific name consistent with being part of the U.S. government or a private company.

Purpose (three conditions 2014-2018, four conditions 2019). Participants in the first five samples were also randomly assigned to one of the following three purposes for UAT usage: economic, environmental, or security. For example, a scenario focused on security dealt with investigating uses of UATs for security purposes, such as monitoring “illegal activities.” A scenario focused on the environment described investigating uses for environmental purposes, such as “to gather water samples.” A scenario focused on the economy described investigating uses for economic purposes, for example, using UATs to “make tasks such as package delivery more efficient.” In 2019, a fourth purpose was added pertaining to the use of UATs for weather and climate science.

Autonomy (three conditions). UAT autonomy was varied by describing the UATs as either “fully autonomous, meaning that they are entirely controlled by computers that have been

programmed to guide their actions. Human manual control is not used,” or “partially autonomous, meaning that they are controlled both by computers that have been programmed to guide their actions, and manually by humans trained to control them remotely,” or “not autonomous, meaning that they are entirely manually controlled by people with remote controls that have been trained to guide the [insert appropriate UAT term here] actions. Computer automated controls are not used.”

Promotion/prevention (two conditions). Additionally, participants were randomly assigned to either a promotion or prevention focused scenario description (Higgins, 1998). Each purpose condition was described in promotion-focused (approaching of positive outcomes, avoiding missed opportunities) or prevention-focused (avoiding of negative outcomes, approaching secure and low-risk situations) terms, as shown in **Table 2**.

Table 2. Promotion and Prevention Descriptions of the UAT Purposes

	Promotion	Prevention
Economic	make tasks such as package delivery more efficient, possibly allowing business owners to expand their businesses and profits and become more competitive, thereby improving the U.S. economy	make tasks such as package delivery more efficient, possibly allowing business owners to cut losses and costs and avoid business closures, thereby helping the U.S. economy to remain stable
Security	actively seek out illegal activities, potentially allowing for the prosecution and punishment of a greater number of crimes happening on U.S. soil, resulting in increases in public safety	help monitor and prevent harm from illegal activities, potentially allowing the prevention of increases in crimes happening on U.S. soil
Environmental	be used to gather water samples in order to discover and document clean water sources, or other sources of valuable natural resources	be used to gather water samples in order to detect water quality problems, or other threats to valuable natural resources
Science (weather)*	gather more types of weather data (e.g., wind, precipitation, aerosols) over more areas, allowing greater and faster advances in the study of climate change and the weather	reduce negative effects from climate change by contributing to more precise weather warnings with greater lead times, allowing people to evacuate prior to disasters

Notes. *Added and used only in 2019.

Measured independent variables. The following predictors were measured rather than manipulated. Unless otherwise noted, statistics such as internal reliability (Cronbach’s alpha) are reported across all participants in all samples, because they were similar across the samples.

Demographics. We asked participants to report their age, gender, and race/ethnicity. For age, any age greater than 100 was considered missing. For race/ethnicity, participants chose all that apply from a list (Hispanic, Black, White, Native Hawaiian or Pacific Islander, Asian, Native American or Alaskan Native, or Other). In addition to the self-report “choose all that

apply” format, Qualtrics participants have a “race_q” categorical variable to represent how Qualtrics Panels classified the respondent for representativeness quotas. As shown in **Table 3**, when people were allowed to choose more than one race/ethnicity designation, they often did so, resulting in greater representation of each racial category in the self-report data than in the Qualtrics category variable.

Table 3. Qualtrics Categories and Self-reported Race/Ethnicity (counts)

		Qualtrics category totals	Self-reported race/ethnicity categories						
			White	Black	Hispanic	Asian	Native Amer./ Alaskan Nat.	Hawaiian / Pacif. Is.	Other
Qualtrics Race/Ethnicity Category (race_q)	White	4267	4267	8	118	7	16	2	0
	Black	729	34	729	27	1	3	0	2
	Hispanic	862	321	17	862	7	12	3	2
	Asian	398	38	2	9	398	3	0	0
	Pacific Island/ American Indian	104	51	15	20	6	58	14	34
	Other	25	8	4	0	0	10	3	13
	Total samples 3-6	6385	4719	775	1036	419	102	22	51
MTurk samples 1 and 2	877	745	86	93	57	16	5	0	
Total	All samples	7262	5464	861	1129	476	118	27	51

Notes. Qualtrics race category was applied to MTurk sample 3 and Qualtrics samples 4-6 but not to MTurk samples 1 and 2.

Political viewpoints. We assessed political views using four questions. One question asked participants to indicate their *political party*, “In politics today do you consider yourself a Republican, Democrat, or Independent/other?” accompanied by a 7-point scale ranging from “Strong Democrat, Democrat, Weak and leaning Democrat, Independent/Other, Weak and leaning Republican, Republican,” to “Strong Republican.” Three items were averaged to create an *ideology* scale (Cronbach’s alpha = .92). These items asked participants, “Ideologically, which of the following best describes you? Overall, When it comes to ECONOMIC issues, and When it comes to SOCIAL issues” each accompanied by a 7-point scale ranging from “Strongly Liberal, Moderately Liberal, Weakly Liberal, Centrist/Middle of the Road, Weakly Conservative, Moderately Conservative,” to “Strongly Conservative.”

Promotion and prevention orientation. We assessed promotion and prevention orientation using four items taken from (see Cunningham, Raye, & Johnson, 2005). Participants responded to these items using a response scale ranging from “Strongly Disagree, Disagree, Slightly Disagree, Neutral, Slightly Agree, Agree,” to “Strongly Agree.” Specifically, *promotion focus* (Cronbach’s alpha = .71) was assessed with two items, “I focus on opportunities that will enhance my life” and “I am primarily motivated by seeking potential successes.” *Prevention focus* (Cronbach’s alpha = .70) was assessed with two items, “I focus on ensuring that I will avoid potential mishaps or negative events,” and “I am primarily motivated by avoiding failure.” These items were administered in random order by the survey software.

Cognitions about and attitudes toward unmanned aerial technology in general.

Prior to 2019, participants were asked open-ended questions to elicit their thoughts about unmanned technologies. Specifically, if they indicated having heard of the technologies (or were unsure), they were asked “If you are able, please give an example or two of where and what have you heard about them” and also to “Briefly describe what you think [term] is.”

As noted earlier, following those two open-ended questions, all participants were given a definition, followed by two open-ended items aimed at eliciting positive and negative cognitions about the technologies: What are one or two concerns that come to mind when you think of [term]?” and “What are one or two hopes or benefits that come to mind when you think of [term]?”

In 2019, participants completed closed ended questions concerning their general attitudes toward UATS (termed drones, UASs, UAVs, or aerial robots) immediately after indicating if they had heard of them, and after being given the definition. This scale included 10 statements covering attitudes about the technologies’ current and future **beneficial effects** (e.g., “In the long run, these technologies will greatly benefit humankind,” “These technologies are beneficial to society,” “These technologies are awesome,” “These technologies are more beneficial than they are harmful,” 4 items, Cronbach’s alpha = .90), current and future **harmful effects** (“In the end, humankind will regret having created these technologies” and “These technologies do more harm than good,” 2 items, Cronbach’s alpha = .81), perceptions of **safety** (e.g., “These technologies are dangerous” or “safe,” 2 items, Cronbach’s alpha = .71) and **annoyance** (These technologies are annoying” or “unnecessary,” 2 items, Cronbach’s alpha = .73). Exploratory factor analyses of various types supported these items as forming correlated scales. Sub scales were created by averaging across related items (after reverse-scoring if needed). In addition, given that correlations between factors were moderately high (> .6, see **Table 4**), and the scree plots from exploratory factor analyses suggested a single factor could be appropriate, a single general **positive attitudes toward UATs** scale was created by reverse-scoring negative items and averaging across all 10 items (Cronbach’s alpha = .93). The survey software administered these items in random order to reduce item order effects.

Table 4. Correlations among UAT Attitudes Scales

	Safety	Annoyance	Beneficial effects	Harmful effects	Full scale - positive
Safety	1	-.627	.698	-.663	.838
Annoyance	-.627	1	-.685	.713	-.849
Beneficial effects	.698	-.685	1	-.697	.922
Harmful effects	-.663	.713	-.697	1	-.865
Full scale – positive atts to UATs	.838	-.849	.922	-.865	1

Notes. The general attitudes scale was only administered in 2019. N=1300 for all cells. p<.001 for all correlations.

Attitudes toward topics relating to purposes of technologies. Participant attitudes toward the experimentally manipulated domain topics or purposes of technology were assessed with the following one-item measures, accompanied by a seven-point (strongly disagree to strongly agree) response scale: “To what extent do you agree with the following?” “I believe protection of our environmental resources should be the nation’s top priority,” “I believe U.S. national security should be the nation’s top priority,” and “I believe that a strong U.S. economy should be the nation’s top priority.” In 2019 two additional items were added: “I believe addressing climate change should be the nation's top priority” and “I believe advancing science should be the nation's top priority.” The survey software administered these items in random order to reduce item order effects.

Subjective knowledge relating to UATs. Beginning in 2016, we also assessed subjective knowledge by asking participants to report the extent to which they feel knowledgeable about “the regulations surrounding the use of [term] for commercial or private use,” “how [term] are currently used by the government,” “how [term] are used for commercial purposes,” and “the various capabilities of [term]—that is, what actions and tasks [term] are currently able to perform and not perform. These four items were accompanied by a five-point response scale (not at all, slightly, somewhat, very, extremely) and all contributed to an internally reliable single factor scale ($\alpha = .91$ across 2016-2019). In 2019 an additional item was added: “How [term] are currently used by scientists” (5-item scale in 2019 $\alpha = .94$). The survey software administered these items in random order to reduce item order effects.

Objective knowledge. Beginning in 2016, we created and used objective knowledge questions based on information found on the “Know before you fly” website (<http://knowbeforeyoufly.org/facts/>). Five facts were revised so that they could be presented as true or false statements (each true versus false item version was randomly assigned by the survey software). In addition to tracking percentage correct for each item among all respondents, participants were given an objective knowledge score ranging from 0 to 5 based on the number of the items that they got correct.

Dependent variables. The following variables are measured variables that theoretically might be influenced by or related to the manipulated or measured independent variables. **Familiarity with UATs.** To assess familiarity with UATs and their use under different experimental conditions, we asked participants if they had heard of the UAT, calling it by the randomly assigned term (drone, UAS, UAV, or aerial robot), and allowing them to indicate, yes, no, or unsure.

Time horizon for use. After each randomly assigned scenario, we asked “In your opinion, how long will it be before [term] are used as described above?” accompanied by the ordinal response options, “they are used that way NOW,” “1-5 years,” “5-10 years,” “10-20

years,” “20-50 years,” “more than 50 years,” and “they will NEVER be used that way” (coded on an ordinal 1-7 scale).

Support. Support for drone use was assessed by averaging across the following two items created for this study (inter-item correlation $r = .84$; Cronbach’s alpha = .91): “To what extent would you support or resist [Actor’s] use of [Term] for the purposes described above? For example, how willing would you be to vote to allow such uses or have public funds promote such uses?” accompanied by a 7-point scale ranging from “strongly resist, resist, slightly resist, neutral/neither, slightly support, support,” to “strongly support,” which were coded 1-7. “To what extent do you approve of [Actor’s] use of [Term] for the purposes described above?” accompanied by a 7-point response scale ranging from “strongly disapprove, disapprove, slightly disapprove, neutral/no opinion, slightly approve, approve,” to “strongly approve,” which were coded 1-7.

Trust and distrust in actors using the technology. Ten items were used in all surveys to assess participant trust in actors using the technology. These items were preceded by the stem, “Below, indicate your opinions about how [Actor] would behave when using [Term] for the purposes described above: [Actor] would...” and followed by a six-point response scale ranging from “never, rarely, sometimes, often, usually,” to “always,” which were coded 1-6. The survey software administered these items in random order to reduce item order effects.

Principal components analysis on the inter-item correlation matrix and using varimax rotation suggested the feasibility of three scales, which were then created by averaging across items. A four item general **trustworthiness of actor** scale (Cronbach’s alpha = .87) was comprised of items reflecting actor benevolence, integrity, transparency, and shared values: “Only use the [Term] to benefit the public at large,” “Be honest with the public about anything they find or do using the [Term],” “Be transparent (open) about how, when, and why they are using the [Term],” and “Use the [Term] to achieve values important to you.” A general **distrustworthiness of actor** scale (Cronbach’s alpha = .82) comprised of a similar set of four items which were negatively rather than positively worded: “Use the [Term] for their own selfish benefit,” “Be dishonest about anything they find or do using the [Term],” “Hide information about how, when and why they are using the [Term],” and “Use [Term] to support values that you disagree with.” A two-item **perceived actor competence** scale (Cronbach’s alpha = .51) was comprised of items: “Be competent in their use of [Term],” and “Be incompetent in their attempts to use the [Term]” (reverse scored). The 10-item overall trust in actor scale (Cronbach’s alpha = .88) was composed of the mean of all items after reverse coding the negative items.

Starting in 2016, an additional item, “Use the [Term] in ways that are appropriate to each situation” was added to the actor trust items. In factor analyses this item loaded strongly on the trustworthiness of actor scale but is analyzed separately to be consistent with scales created in prior years.

The correlations among the trust in actor variables are shown in **Table 5**. As shown, the various individual scales (trust, distrust, competence) were moderately correlated ($r_s = .55$ to $.56$). The item pertaining to actors using the technologies appropriately was most correlated with the trust scale ($r = .72$) and least correlated with the distrust scale ($r = -.40$).

Table 5. Correlations among Trust in Actors Scales

	Trust of actor	DIStrust of actor	Actor competence	Actor use appropriate	Overall trust in actor
Trust in the honesty, benevolence, values and transparency of actor	1	-.551	.561	.717	.872
DIStrust in the honesty, benevolence, values and transparency of actor	-.551	1	-.558	-.404	-.863
Trust in the competence of the actor	.561	-.558	1	.532	.759
*Trust actor to use technology appropriately (*single item)	.717	-.404	.532	1	.661
Overall trust in actor	.872	-.863	.759	.661	1
Total N	7262	7262	7262	6385	7262

Notes. All correlations were significant at the $p < .001$ level. All of the variables are scales except for the appropriate use variable, which is comprised of a single item.

Trust and distrust in those regulating the technology. Beginning in 2016 we also assessed participant trust and distrust in those regulating the technology. These thirteen items were preceded by the stem, “Indicate the extent to which you agree with the following statements as they relate to the likely REGULATORS of the [Term] for the purposes described. What do you think? How well do the following statements describe those who regulate the [Term] for the described purposes....” This was followed by a seven-point scale ranging “Strongly Disagree, Disagree, Slightly Disagree, Neither Agree or Disagree, Slightly Agree, Agree” to “Strongly Agree,” which were coded 1-7. The survey software administered these items in random order to reduce item order effects.

Principal components analysis on the inter-item correlation matrix and using varimax rotation suggested the feasibility of three scales, which were then created by averaging across items. A five-item general **trustworthiness of regulators** scale (Cronbach’s alpha = .88) included five items reflecting regulator honesty, values, transparency, and legitimacy: “They care about the people they affect,” “They are honest,” “They share your important values,” “They would share information openly and quickly when asked,” “They are legitimate authorities.” A **general distrustworthiness of regulators** scale (Cronbach’s alpha = .85) consisted of four similar items which were negatively worded, rather than positively worded: “They lack concern for those they affect,” “In general, they are dishonest,” “They do not support your values,” “They are secretive.” A two-item **perceived competency of regulators** scale (Cronbach’s alpha = .72) consisted of the items: “They are highly competent,” and “They are incompetent” (reverse scored). In addition all items in the three subscales above (after reverse scoring negative items) were averaged to create an **overall trust in regulators** scale (11 items, Cronbach’s alpha = .92).

The item “They have no right to tell people what to do” was intended as a *negative legitimacy* item but reduced the internal validity of the distrustworthiness and overall trust scale, so was analyzed separately from the other items. In addition, the item “They have the *resources needed* to do their job” appeared to fit best with the competency scale according to exploratory factor analyses, but is analyzed separately because it lacks face validity for competence.

As shown in **Table 6**, the correlations among the trust scales for regulators (trust, distrust and competence) were somewhat higher (.64-.69) than they were among the trust in actors scales (which are in the .55-.56 range).

Table 6. Correlations among Trust in Regulator Variables

	Trust in regulators	Distrust in regulators	Regulator competence	*Have the resources needed	*Have right to tell people what to do	Overall trust in regulators
Trust in regulators	1	-.690	.644	.388	.248	.924
Distrust in regulators	-.690	1	-.637	-.200	-.368	-.892
Regulator competence	.644	-.637	1	.456	.210	.796
*Regulators have the resources needed	.388	-.200	.456	1	-.023	.374
*Regulators do not have right to tell people what to do (Rev)	.248	-.368	.210	-.023	1	.320
Overall trust in regulators	.924	-.892	.796	.374	.320	1

Notes. N = 6385 because these variables were not administered until 2016. The significance level for all correlations is $p < .001$. *Indicates single item variables; all others are scales.

Trust and distrust the technology. Beginning in 2016, we also assessed participant trust and distrust of the technology itself. These fourteen items were preceded by the stem, “Indicate the extent to which you think the following would happen, as related to the [term] that are used for the specific purpose described. What do you think? When used for the described purposes, how often would the [term]. . . .” This was followed by a six-point scale ranging, “Never or Almost Never, Rarely, Sometimes, Often, Usually” to “Always or Almost Always,” which were coded 1-6. The survey software administered these items in random order to reduce item order effects.

Principal components analysis on the inter-item correlation matrix and using varimax rotation suggested the feasibility of two scales, which were then created by averaging across items. A six-item ***general distrustworthiness of technology*** scale (6 items, Cronbach’s alpha = .88) was comprised of items reflecting the technology’s ability to function, meet its purpose, and potential consequences: “Malfunction,” “Result in injuries to people,” “Result in destruction of property,” “Threaten people’s privacy,” “Fail to achieve their intended purposes,” and “Result in

negative effects.” A *general trustworthiness of technology* scale (8 items, Cronbach’s alpha = .88) comprised a similar set of similar items that were positively, rather than negatively, worded: “Function reliably as expected,” “Increase people’s safety on the ground,” “Result in protection of people’s property,” “Protect people’s privacy,” “Achieve their intended purposes,” “Result in unintended positive effects,” “Increase pilot safety,” and “Increase the safety of other people in the air (i.e., in manned aircrafts.” The overall scale (14 items) reflecting trust and lack of distrust had a Cronbach’s alpha of .89. The correlation between the trust and distrust of UATs scales was -.39, which is somewhat lower than observed for the trust/distrust of actors and regulators.

Open-ended coding procedures

For the 2016 Qualtrics data only, responses to the questions about participant hopes and concerns that come to mind when they think of unmanned aerial technologies were separately subjected to qualitative analyses. The unit of analysis was the entire written response of one participant for each given question, and responses were coded using a rubric first developed on an earlier data set (the 2014 data), and then refined and revised for the 2016 data. Specifically, in 2014, initial codes were developed by the research team by reviewing a subset of the responses to the questions to identify themes or topic categories for both concerns and hopes. From there, the research team developed an initial list of themes/codes with associated definitions and examples in a codebook.

In 2016 the codebook was refined by coding subsets of the data by members of the research team together, discussing areas of agreement and disagreement, and then coming to consensus on the revised code definitions and appropriate codes (Lincoln & Guba, 1985). The research team coded the first 150 coding responses separately. Each response was coded as either having each theme present or absent. Because our coding scheme was comprehensive, all responses received at least one code. After this initial round of coding, the research team met and discussed areas of disagreement and refined the codebook. The three research team members then independently coded an additional 100 responses, discussed differing codes to come agreement, and refined the codebook further. Two coders then coded four additional rounds of data (one round included approximately 200-500 lines of data) independently. After each round of coding, areas of disagreement were discussed and comments recoded once agreement was reached. Finally, the coders then coded the remainder of the responses independently. Validation for qualitative results was reached using interrater reliability based on percent agreement, exemplars, and peer review (Corbin & Strauss, 2015; Suter, 2009). The final coding guide contains a broad definition for each major area that was arrived at in consultation with the entire research team, along with exemplars for each code. The final coding scheme identified 11 codes for concerns, and 10 codes for hopes. The codes are described in greater depth in the Results section of this report. Also, a more complete list of the codes, their definitions, and examples of responses illustrating the codes, can be found in Appendix B.

Table 7. Agreement Levels for Coded Variables.

Review period	#Responses	# Coders	% Agreement
Round 1	150	3	-
Round 2	100	3	-
Round 3	200	2	77%
Round 4	100	2	-
Round 5	400	2	-
Round 6	500	2	98%
Remainder	639	1	-

Results

Preliminary Results: Pairwise Comparison of Samples

We used pairwise comparisons between samples to compare the samples on all the variables assessed by the survey. This was intended to foster a detailed understanding of how the samples might differ, especially on initial equivalence variables such as demographics. Because we were most interested in detecting differences between samples that might exist we did not correct p-values for multiple comparisons, but rather used the most sensitive test, Fisher’s Least Significant Difference test, to determine significance of pairwise comparisons. Results are presented in **Table 8**.

MTurk vs. Qualtrics in 2016. In 2016 we could directly compare the Qualtrics and MTurk samples, and found they differed in a number of ways. These demographic and individual difference comparisons are reported in **Table 8**. As shown, the Qualtrics 2016 sample took a **longer time to complete the survey** questions once they began the survey than the MTurk 2016 sample. In part this may be due to screening out and ending the surveys of “speeding” participants during data collection for the Qualtrics sample. The samples did not differ in terms of gender make up, although earlier MTurk samples varied more in gender across samples than the Qualtrics samples overall, due to Qualtrics use of representative quotas. There also were not differences in proportional representation of native Hawaiian/Pacific Islanders or Native Americans/Alaskan Natives, but in other respects the samples did differ. Specifically, compared to the MTurk 2016 sample, those in the Qualtrics 2016 sample, a sample designed to be nationally representative, were less likely to be **white**, were **older** and included more **Blacks and Hispanics** but fewer **Asians**. In addition, Qualtrics respondents reported more often being **pilots**, significantly more **conservative attitudes**, and greater agreement with each issue-relevant attitude than the MTurk participants. The 2016 Qualtrics sample also indicated being both more **promotion and prevention focused**, and tended to have, on balance, more prevention focus than promotion focus. The Qualtrics participants also more often indicated **not having heard of the technologies**, yet gave a shorter **estimated time** until the technologies would be used as depicted by the scenarios. The 2016 Qualtrics and MTurk samples did not differ on reported support for

the technologies, trust in actor using them, or trust in the technology. However they did differ in [trust in regulators](#) with the 2016 MTurk sample trusting regulators more than the 2016 Qualtrics sample. The Qualtrics sample also reported significantly greater [subjective knowledge](#) but did not score significantly higher on the objective T/F knowledge questions (sometimes they scored lower).

Table 8. Between Sample Pairwise Comparisons on All Variables

	2014 MTurk	2015 MTurk	2016 MTurk	2016 Qualtrics	2018 Qualtrics	2019 Qualtrics	Total
N	576	301	1946	2089	1050	1300	7262
Time to complete survey (minutes range: 1-458; minutes20 range: 1-20)							
Minutes M	7.50 ^a	8.21 ^a	12.02 ^b	16.61 ^d	16.32 ^d	14.04 ^c	13.81
Minutes SD	4.65	9.65	6.93	19.12	25.70	9.90	15.65
Minutes20 M	7.36 ^a	7.44 ^a	11.23 ^b	12.92 ^d	12.93 ^d	12.22 ^c	11.68
Minutes20 SD	3.95	4.14	4.64	5.08	4.77	4.79	5.05
Gender (0 = male, 1 = female)							
Male N	299	134	928	1001	504	624	3490
Male %	51.9% ^a	44.5% ^b	47.7% ^{a,b}	47.9% ^{a,b}	48.0% ^{a,b}	48.0% ^{a,b}	48.1%
Female N	772	167	1018	1088	546	676	3772
Female %	48.1% ^a	55.5% ^b	52.3% ^{a,b}	52.1% ^{a,b}	52.0% ^{a,b}	52.0% ^{a,b}	51.9%
Age (range 18-96 years)							
Age M years	36.24 ^a	36.59 ^a	36.04 ^a	46.41 ^b	46.53 ^b	46.76 ^b	42.50
Age SD	12.77	12.32	11.68	16.47	16.62	16.47	15.75
Age range	18-75	18-69	18-79	18-96	18-85	18-86	18-96
Race/Ethnicity (self-report, choose all that apply) (0 = no, 1 = yes)							
White %	84.0% ^{a,b}	86.7% ^a	81.1% ^b	72.0% ^c	68.3% ^d	70.7% ^{c,d}	75.2%
Minority %	27.6% ^a	23.6% ^{a,b}	22.8% ^b	40.2% ^{c,d}	43.4% ^c	37.2% ^d	33.8%
Hispanic %	11.1% ^a	9.6% ^{a,b}	5.4% ^b	22.5% ^c	22.7% ^c	17.1% ^d	15.5%
Black %	10.4% ^{a,b}	8.6% ^a	8.4% ^a	13.1% ^{b,c}	14.8% ^c	14.1% ^c	11.9%
Asian %	6.6% ^{a,b}	6.3% ^{a,b}	8.2% ^a	5.6% ^b	6.2% ^b	6.0% ^b	6.6%
Native AAI %	2.3% ^{a,b}	1.0% ^a	1.4% ^a	1.2% ^a	2.9% ^b	1.5% ^a	1.6%
NativeHPI%	0.5% ^a	0.7% ^a	0.3% ^a	0.4% ^a	0.3% ^a	0.4% ^a	0.4%
Other%	0.0% ^a	0.0% ^{a,b}	0.7% ^{a,b,c}	0.6% ^{a,b}	1.0% ^{b,c}	1.2% ^c	.7%
Commercial/Certified pilot (0 = no, 1 = yes)							
Pilot - yes N	-	-	11	38	15	16	80/6385
Pilot - yes %	-	-	0.6% ^a	1.8% ^b	1.4% ^b	1.2% ^{a,b}	1.1%
Political attitudes (range 1 strong democrat/liberal - 7 strong republican/conservative)							
Political Party M	3.56 ^{a,b}	3.49 ^a	3.60 ^a	3.72 ^b	3.74 ^{b,c}	3.86 ^c	3.69
Political Party SD	1.61	1.64	1.59	1.78	1.91	1.95	1.77
Ideology scale M	3.65 ^a	3.51 ^a	3.55 ^a	4.12 ^b	4.03 ^b	4.10 ^b	3.89
Ideology scale SD	1.65	1.72	1.68	1.73	1.75	1.81	1.74
Ideology economic M	3.99 ^a	3.87 ^a	3.96 ^a	4.36 ^b	4.24 ^b	4.31 ^b	4.18
Ideology econ. SD	1.78	1.94	1.86	1.82	1.83	1.89	1.85
Ideology social M	3.34 ^a	3.16 ^a	3.16 ^a	3.91 ^b	3.86 ^b	3.93 ^b	3.63
Ideology social SD	1.87	1.84	1.84	1.94	1.94	1.97	1.94

	2014 MTurk	2015 MTurk	2016 MTurk	2016 Qualtrics	2018 Qualtrics	2019 Qualtrics	Total
Issue-relevant attitudes (1=strongly disagree to 7 = strongly agree)							
Enviratt M	5.12 ^{a,b}	5.35 ^{c,d}	5.01^a	5.22^{b,c}	5.43 ^d	5.44 ^d	5.23
Enviratt SD	1.41	1.46	1.48	1.49	1.44	1.37	1.46
Security att M	4.89 ^a	4.85 ^a	4.87^a	5.72^c	5.45 ^b	5.56 ^b	5.32
Security att SD	1.57	1.68	1.57	1.34	1.47	1.40	1.51
Economics att M	5.49 ^{a,b}	5.49 ^{a,b}	5.37^a	5.72^c	5.51 ^b	5.58 ^b	5.54
Economics att SD	1.21	1.21	1.25	1.19	1.34	1.28	1.25
Science att M	-	-	-	-	-	5.04	5.04
Science att SD	-	-	-	-	-	1.44	1.44
Climate att M	-	-	-	-	-	4.94	4.94
Climate att SD	-	-	-	-	-	1.87	1.87
Promotion/prevention focus (1=strongly disagree to 7 = strongly agree with focus attitudes)							
Promofocus M	5.41 ^a	5.42 ^a	5.38^a	5.44^a	5.43 ^a	5.57 ^b	5.44
Promofocus SD	1.05	1.10	1.01	1.05	1.07	1.05	1.05
Prevfocus M	4.75 ^a	4.72 ^a	4.69^a	5.15^b	5.15 ^b	5.26 ^c	5.00
Prevfocus SD	1.42	1.40	1.34	1.16	1.19	1.15	1.27
Difference between promotion and prevention focus z-scores (range -5.83 to 4.65)							
Promo-Prev bal M	0.17 ^a	0.20 ^a	0.18^a	-0.13^b	-0.13 ^b	-0.09 ^b	0.00
Promo-Prev bal SD	1.40	1.38	1.39	0.97	0.98	1.00	1.17
Have heard of [term] (Yes, No, Unsure, % in each category)							
Haveheard-Yes	56.1% ^{b,c}	61.1% ^c	59.6%^d	54.1%^b	49.0% ^a	56.4% ^{c,d}	55.7%
Haveheard-No	35.2% ^{b,c}	32.6% ^c	28.9%^d	36.6%^b	40.6% ^a	32.8% ^{c,d}	34.2%
Haveheard-Unsure	8.7% ^{b,c}	6.3% ^c	11.6%^d	9.2%^b	10.5% ^a	10.2% ^{c,d}	10.2%
Haveheard2 (ordinal) (Mean and SD across 0 = no, 1 = unsure, 2 = yes)							
Haveheard2 M	1.21 ^b	1.29 ^{b,c}	1.31^c	1.18^b	1.08 ^a	1.24 ^c	1.22
Haveheard2 SD	0.93	0.93	0.89	0.94	0.94	0.91	0.92
How long before use (1=Used Now, 2=1-5years, 4=10-20years, 6=more than 50years, 7=Never will)							
Howlong M	2.57 ^{c,d}	2.44 ^{b,c}	2.37^b	2.24^a	2.60 ^d	2.43 ^b	2.40
Howlong SD	1.26	1.31	1.16	1.27	1.31	1.17	1.24
Support and Trust DVs (support and trust regulators: 1= low support/trust/strongly disagree, 7=high support/trust/strongly agree; trust actors/users and UATs: 1=low trust/never, 6=high trust/always)							
Support M	4.27 ^a	4.28 ^a	4.48^{b,c}	4.39^{a,b}	4.32 ^a	4.58 ^c	4.43
Support SD	1.64	1.70	1.60	1.56	1.62	1.58	1.60
Trust Actor Overall M	3.39 ^a	3.37 ^a	3.47^{a,b}	3.52^{b,c}	3.56 ^c	3.72 ^d	3.53
Trust Actor SD	0.96	1.00	0.94	0.93	0.99	0.98	0.96
Trust_reg Overall M	-	-	4.18^{b,c}	4.01^a	4.12 ^b	4.29 ^c	4.14
Trust_reg SD	-	-	1.13	1.08	1.14	1.20	1.14
Trust_UAT Overall M	-	-	3.57^a	3.57^a	3.62 ^a	3.73 ^b	3.61
Trust_UAT SD	-	-	0.68	0.77	0.83	0.86	0.78
Knowledge variables (subjknow 1=not at all, 5=extremely knowledgeable; objknow 0-5 correct)							
Subjknow M	-	-	2.14^a	2.33^b	2.30 ^b	2.40 ^c	2.28

	2014 MTurk	2015 MTurk	2016 MTurk	2016 Qualtrics	2018 Qualtrics	2019 Qualtrics	Total
Subjknow SD	-	-	0.82	0.98	1.04	1.02	0.96
Objknow M			3.12^b	3.05^b	2.90 ^a	2.91 ^a	3.02
Objknow SD			1.09	1.14	1.14	1.12	1.12
Objective knowledge items (0/1 correct; M = mean = proportion of each sample getting item correct)							
FAA regulations state that [term] must follow temporary flight restrictions around stadiums and racetracks. (T) Knw1_1_cor M			0.86^{a,b}	0.83^a	0.83 ^a	0.88 ^b	0.85
Knw1_1_cor SD			0.35	0.37	0.38	0.33	0.36
Knw1_1_cor N			960	1070	526	638	3194
FAA regulations state that [term] are prohibited from flying around stadiums and racetracks at any time. (F) Knw1_2_cor M			0.32^b	0.30^b	0.31 ^b	0.25 ^a	0.30
Knw1_2_cor SD			0.46	0.46	0.46	0.44	0.46
Knw1_2_cor N			986	1019	524	662	3191
Unless granted a waiver, most [term] should stay below 400 feet. (T) Knw2_1_cor M			0.86^b	0.78^a	0.78 ^a	0.81 ^a	0.81
Knw2_1_cor SD			0.35	0.41	0.41	0.39	0.39
Knw2_1_cor N			991	1076	503	647	3217
Unless granted a waiver, most [term] should be flown above 500 feet. (F) Knw2_2_cor M			0.58^c	0.51^b	0.41 ^a	0.42 ^a	0.49
Knw2_2_cor SD			0.49	0.50	0.49	0.49	0.50
Knw2_2_cor N			955	1013	547	653	3168
Businesses can request exemptions from certain FAA regulations regarding the use of [term]. (T) Knw3_1_cor M			0.67^b	0.63^{a,b}	0.62 ^{a,b}	0.60 ^a	0.63
Knw3_1_cor SD			0.47	0.48	0.49	0.49	0.48
Knw3_1_cor N			950	1037	517	598	3102
Currently, the FAA does not allow any exemptions from regulations regarding the use of [term]. (F) Knw3_2_cor M			0.58^b	0.53^a	0.51 ^a	0.49 ^a	0.53
Knw3_2_cor SD			0.49	0.50	0.50	0.50	0.50
Knw3_2_cor N			996	1052	533	702	3283
Unless they receive a waiver, operators must keep [term] in their sight. (T) Knw4_1_cor M			0.73^a	0.75^a	0.72 ^a	0.73 ^a	0.74
Knw4_1_cor SD			0.45	0.43	0.45	0.44	0.44
Knw4_1_cor N			940	1065	523	643	3171
Operators are only allowed to fly [term] outside of their line of sight if the [term] are equipped with GPS tracking technologies. (F) Knw4_2_cor M			0.35^{a,b}	0.39^{a,b}	0.33 ^a	0.37 ^b	0.36
Knw4_2_cor SD			0.48	0.49	0.47	0.48	0.48

	2014 MTurk	2015 MTurk	2016 MTurk	2016 Qualtrics	2018 Qualtrics	2019 Qualtrics	Total
Knw4_2_cor N			1006	1024	527	657	3214
The Modernization Reform Act of 2012 required the FAA to create rules for the use of [term] in the U.S. (T) Knw5_1_cor M			0.79^a	0.78^a	0.78 ^a	0.79 ^a	0.79
Knw5_1_cor SD			0.41	0.41	0.41	0.41	0.41
Knw5_1_cor N			997	1023	542	661	3223
Most of the rules regulating use of [term] in the U.S. were established by the FAA in 1995. (F) Knw5_2_cor M			0.53^{a,b}	0.57^b	0.52 ^a	0.49 ^a	0.54
Knw5_2_cor SD			0.50	0.49	0.50	0.50	0.50
Knw5_2_cor N			949	1066	508	639	3162

Notes. Common superscripts indicate values within a row that do not significantly differ from one another.

Howlong response scale 1=They are used that way NOW, 7=They will NEVER be used that way. Knowledge question statistics reflect the proportion of persons answering correctly. Knowledge statistics in red are statistically different from one another.

Preliminary Analyses: Initial Equivalence of Experimental Conditions Overall

Given that we used random assignment of participants to the experimental conditions, there should have been no significant or substantial relationships between demographics and experimental condition within each sample. However, given changes in methods across data sets (e.g., the introduction of a new condition in 2019) and changes in demographics across samples (as shown in **Table 8**), such relationships might emerge in the data set as a whole. As a preliminary check for the independence of our experimental conditions and demographics we looked at simple associations between each demographic variable and each individual condition.

Examination of simple associative relationships (Pearson correlations), revealed some very small but statistically significant relationships between demographic or initial attitude variables and the experimental conditions. Very small correlations were statistically significant due to the large (over 7,000) overall sample size. For example, there was a slight negative correlation between age and being assigned to the condition using the term “drone” ($r = -.03, p < .05$). Small correlations also emerged for race: Self-identifying as white negatively predicted being in the partially autonomous condition ($r = -.03, p < .05$), and identifying as a minority negatively predicted being assigned the manual control condition ($r = -.03, p < .05$). Also, identifying as Hispanic was slightly negatively predictive of being in the “UAV” term condition ($r = -.04, p < .01$) and positively predictive of receiving the autonomous control condition ($r = .03, p < .05$). Identifying as Black also was related to receiving scenarios depicting public actors, semi-autonomous technologies ($rs = .03, p < .05$), and not related to economics ($r = -.03, p < .05$). Conservative ideology slightly predicted receiving the “UAV” term condition ($r = .03, p < .05$) and Conservative/Republican Party views slightly predicted being in the prevention goal condition ($r = .03, p < .05$).

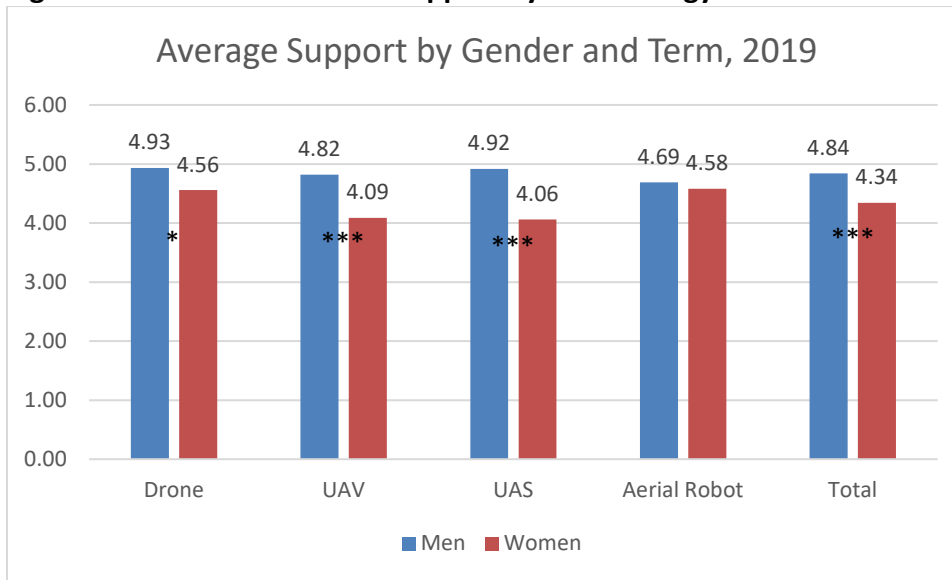
The full set of these small but sometimes statistically significant correlations are displayed in Table 1 in Appendix C to this report. Rarely, however, were any of the correlations above .03, except in the case of correlations with assignment to the science purpose condition, which could only occur in sample 6 and therefore was associated with any demographics of sample 6 which were unique.

Preliminary Analyses: Demographic Predictors of Support and Trust

Prior to examining other main effects, we examined the relationships between various demographics and our main dependent variables: support for UATs and trust in actors, regulators, and the technologies. Given that demographics varied across samples, and sample type (Qualtrics vs. MTurk varied over time), demographic effects might create or hide potential effects of time. Examination of the simple relationships, whether by each sample separately, or for the entire dataset, revealed only small correlations between demographics and the trust/support variables. Most observed correlations were sometimes statistically significant but quite small (less than or equal to .10). Gender and age provided two exceptions.

Gender and support (2019). The strongest observed relationship between demographics and our primary dependent variables was $r = -.16$ ($p < .001$) for gender in 2019, indicating that men supported the technologies to a greater extent than women. Furthermore, the relationship between gender and support appeared to be growing over time ($r_s = -.06, -.07$; $p_s < .05$ in the earlier 2016 and 2017 Qualtrics samples). Additional analyses examining the effect of gender across experimental conditions in 2019 suggested that the effect of gender did depend upon which term was used to describe the technology, as shown in **Figure 1**. Specifically, the difference in support between men and women was greatest when the technology was referred to as UAVs or UASs. There was a smaller but still statistically significant difference when referring to the technology as drones, and only a non-significant difference in support when referring to the technology as aerial robots.

Figure 1. Effect of Gender on Support by Terminology in 2019



Notes. * $p < .05$, *** $p < .001$ significance of differences in support by gender.

Age and trust in actor using technology (2019). The next strongest correlation was between age and trust in the actor using the technology ($r = .14, p < .001$) in 2019, suggesting older people were more trusting in the actors using the technologies than younger persons. Examination of the two-way interactions between age and the experimental factors did not indicate that the age effect was impacted by any given experimental factor (p s for two-way interactions $> .17$).

Open-ended Hopes and Concerns

In all of the surveys except in 2019, participants were asked to list their hopes and concerns in open-ended text box responses in the survey. As described in the methods section, the researchers conducted qualitative coding of all of the 2016 Qualtrics data. We focused on this dataset because it was a representative sample of the U.S. and could be compared to the 2016 MTurk data later if desired. This coding was conducted in order to examine frequencies of mentioned hopes and concerns, and whether the hopes/concerns listed by participants differed by other factors such as demographics and use of different terminology for the technologies.

The most common concerns listed by participants were privacy and safety concerns (Table 9). Technical concerns and concerns about moral misuse were also mentioned often. People wondered if the technologies would malfunction or, for example, that autonomous technologies may have limitations compared to human-controlled devices. Concerns mentioned less often included concerns about hacking or hijacking of the technologies and economic impacts (e.g., loss of jobs, cost of technologies).

Meanwhile, the most common hopes were improved services (e.g., efficiencies, delivery) and improved safety (**Table 10**). Interestingly, safety was frequently expressed under both the hope and concern categories. Participants noted that drone technology provided opportunities to both improve control and safety by reducing human error, but also reduce safety with increased risk of accidents or security concerns. The third most mentioned hope was related to use by and for military and law enforcement. Hopes mentioned less often included use of the technologies for fun and recreation and use of the technologies to improve human control and reduce errors or accidents.

Table 9. Frequency of Mention of Concerns with Exemplar Quotes (2016 Qualtrics)

Code	Frequency	%	Description	Examples
Privacy	703	33.7	<u>Privacy</u> Comments that note concerns about privacy or people (or the government) spying on them.	“Government invasion of privacy” “For one, nobody likes the idea of being observed by a drone through their window”
Accidents, lack of security	638	30.5	<u>Accidents</u> Comments that include concerns over crashes and “accidents” or that mention danger or safety or property damage <u>Safety/Security or Danger Themes</u> Comments about airspace safety (not just air space traffic, but safety), safety for other manned flying devices, accidental deaths, injuries, etc., “dangerous”	“Mistakes and crashing” “Electronic malfunction that causes it to crash while no one is there to direct it” “Accidentally killing innocent people”
Reliability	516	24.7	<u>Reliability and Tech Malfunctions or concerns about tech/design features</u> Concerns over drone malfunctions, lack of control of technology, possibility of tech failure, and drones not being able to carry out intended purposes under various conditions (e.g., weather); limitations of technologies	“The system could fail easily because even technology fails” “malfunction or it may die out” “reliability, not being able to get to their destination”
Moral misuse	476	22.8	<u>Moral or Intentional Misuse</u> Comments that note potential (intentional) misuse of technology, whether it be by civilians, the military, or other government officials. Any crimes including trespassing, spying.	“It detaches the pilot from the consequences of his actions” “Drones used overseas for war and distribution of drugs and weapons”
Other concerns	254	12.2	<u>Other</u> Comments that do not otherwise fit in any category	Regulations (not airspace) or too general to categorize, nuisance
Operator / Pilot	216	10.3	<u>Pilot and Autonomy</u> Concerns over who or what’s operating or controlling the drones (or not operating it if	“No pilot”

Code	Frequency	%	Description	Examples
			autonomous), drone autonomy, and fallible human element of drone operation (including carelessness fallibility of the pilot); Autonomy of the UAS relating to evolving, taking control of itself, taking over the world	“I don't like that there isn't a pilot to be there to adjust for weather conditions etc.” “That it could be dangerous depending on who is navigating it”
Air traffic	185	8.9	Air Traffic Concerns over air traffic problems such as flight interferences, air craft coordination, regulations, infrastructure (i.e. power lines)	“potential for entering into aviation flight paths” “tangling in power lines and getting in the way of planes”
Hacking or hijack	104	5.0	Hijacking and Hacking Comments that note concerns about hacking of the machine or hijacking.	“There could also be the possibility that a drone could be hacked and taken over by someone else”
No concerns	101	4.8	No Concerns Comments that say they have no concerns or do not answer the question	“no concerns” “none”
Economic impact (i.e., job loss)	39	1.9	Economic Comments that refer to economic concerns (i.e. job loss, costs, impact on companies, etc.) and issues of efficiency	“What will happen to human pilots?” “cost of drones”
Unsure / don't know	26	1.2	Don't Know Participants that respond they do not know what concerns them regarding drones	“Not sure” “I don't know enough to form an opinion”

Table 10. Frequency of Mentions of Hopes with Exemplar Quotes (2016 Qualtrics)

Code	Frequency	%	Description	Examples
Services	814	39.0	Improved Services & Economic Benefits Comments that refer to services that can be provided, such as deliveries or better photography. Includes commercial service, good will, or mission trips. Include comments that refer to the economic benefits that may result from this technology (i.e. better efficiency, save money, etc.); Often technological abilities (e.g., fly a long time); innovation	“Deliveries, at 2:30 am!” “Photography will improve” “It is probably cheaper in the long run” “From a commercial perspective, quicker and more efficient delivery mechanism”
Safety features	501	24.0	Safety Features Comments that refer to improved safety conditions (i.e. less risk to pilot, fewer deaths, etc.); and getting into dangerous places without risk to humans,	“Less soldiers have to die with UASs” “Good for spy missions and not risking human life”

Code	Frequency	%	Description	Examples
Law enforcement & military uses	457	21.9	<u>Law Enforcement and Military Uses</u> Comments that refer to different uses available to law enforcement and/or the military (i.e., security, boarder control, preventing or stopping crime and terrorism, combat, war, bombs, spying, etc.).	“They can prevent or lessen the harm of crime to others” “Dropping bombs, spying for information”
No hopes	254	12.2	<u>No Hopes or Negative Hopes (concerns)</u> Participants respond that they have no hopes or do not approve of drone usage (or some other derivative) and those that do not answer the question. Participants list that they “hope” their concerns don’t come true.	“There is no benefit” “I hope that Americans decry the use of aerial robots” “I hope that they don’t kill us all”
Emergency medical use for first responders or military use	220	10.5	<u>Emergency Medical Use</u> Comments that refer to search and rescue, first response, disaster relief, search & rescue, or health outreach by military, NGOs, or first responders,	“help in search and rescues” “delivering medical supplies and water”
Environmental & research uses	129	6.2	<u>Environmental and Research Uses</u> Comments that note potential environmental or research uses (i.e. natural resources, weather, space, etc.)	“Surveying” and “mapping” (note: also coded as service) “Observing forest fires or the weather, or a natural disaster” “if they were used for something good I’d be fine with it”
Other hope	120	5.7	<u>Other</u> Comments or parts of comments that do not otherwise fit in any category	“spare human life in dangerous situations / biological sensing” “It’s great to have new technology, just not sure the benefits at this point without further research” “That they will be successful” “There might be less human error”
Control: improved technical control	94	4.5	<u>Control</u> Comments that note better control due to this technology (i.e. less human error, fewer accidents)	“You can control them wherever you are”
Don’t know	78	3.7	<u>Don’t Know</u> Participants that respond they do not know what hopes they have regarding drones	“Don’t know” “I have no clue. I don’t know anything about them”
Fun or recreational use	33	1.6	<u>Fun and Recreation</u> Comments that note participants are hopeful for recreational use of drones, and the entertainment they could provide to such hobbyists	“being able to have fun” “is fun” “probably like to play with them”

Hopes and Concerns by Gender. Examination of gender differences using chi-square analyses revealed female respondents were significantly more likely to list concerns about reliability, economic implications, and drone autonomy/pilots. Male respondents were significantly more likely to list concerns about drone misuse and interference with other air traffic, or to say that they had no concerns (**Table 11**). Respondents who identified as male also were more likely to report hopes about environment or research uses, while respondents who identified as female were more likely to report no hopes or that they didn't know (**Table 12**).

Table 11. Concerns by Gender

Concern	% of male listing concern	% of female listing concern	Difference
Reliability	21.6**	27.6**	$\chi^2 = 10.07, p = .002$
Accidents	30.2	30.9	$\chi^2 = 0.13, p = .72$
Hijack	5.0	5.0	$\chi^2 = .001, p = .97$
Misuse	26.0**	19.9**	$\chi^2 = 11.10, p = .001$
Privacy	35.1	32.4	$\chi^2 = 1.72, p = .19$
Economic	0.6***	3.0***	$\chi^2 = 16.85, p < .001$
Autonomy / Pilot	7.1***	13.3***	$\chi^2 = 21.86, p < .001$
Air traffic	10.4*	7.4*	$\chi^2 = 5.60, p = .02$
Don't know	0.9	1.6	$\chi^2 = 1.87, p = .17$
No concerns	6.2**	3.6**	$\chi^2 = 7.71, p = .005$
Other	12.3	12.0	$\chi^2 = 0.03, p = .863$

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; Bolded values represent higher values.

Table 12. Hopes by Gender

Hope	% of male listing hope	% of female listing hope	Difference
Law/Military use	21.5	22.2	$\chi^2 = 0.18, p = .673$
Emergency medical use	11.5	9.7	$\chi^2 = 1.87, p = .172$
Environment / Research	8.3***	4.2***	$\chi^2 = 14.86, p < .001$
Service	40.7	37.4	$\chi^2 = 2.32, p = .128$
Safety	25.0	23.1	$\chi^2 = 1.04, p = .308$
Control	5.0	4.0	$\chi^2 = 1.10, p = .295$
Fun / Recreational	1.5	1.7	$\chi^2 = 0.08, p = .775$
No hopes (negative)	8.7***	15.3***	$\chi^2 = 21.64, p < .001$
Don't know	2.7*	4.7*	$\chi^2 = 5.75, p = .017$
Other	5.6	5.9	$\chi^2 = 0.08, p = .778$

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; Bolded values represent higher values.

Hopes & Concerns by Age. Those who listed concerns about reliability, hijacking, economic impact, and autonomy were significantly younger, on average, than those who did not list these concerns. Meanwhile, those who listed concerns about accidents, misuse, privacy, and air traffic, were significantly older than those who did not list these (see **Table 13**). When it came to hopes, those who listed hopes for control and other were significantly younger; while those who listed hopes for law/military use, emergency medical use, environmental research use, and no hopes were significantly older (see **Table 14**).

Table 13. Concerns by Age

Concern	Average age listing concern	Average age not listing concern	Difference
Reliability	43.02***	47.52***	F = 29.29, $p < .001$
Accidents	47.71*	45.84*	F = 5.76, $p = .017$
Hijack	40.14*	46.74*	F = 15.96, $p < .001$
Misuse	48.60**	45.76**	F = 10.91, $p = .001$
Privacy	49.15***	45.02***	F = 29.75, $p < .001$
Economic	37.92*	46.57***	F = 10.60, $p = .001$
Autonomy / Pilot	42.54***	46.86***	F = 13.40, $p < .001$
Air traffic	55.56***	45.52***	F = 64.66, $p < .001$
Don't know	46.42	46.41	F = .00, $p = .996$
No concerns	49.38	46.26	F = 3.45, $p = .063$
Other	44.61	46.66	F = 3.47, $p = .063$

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; Bolded values represent higher age mean values.

Table 14. Hopes by Age

Hope	Average age listing hope	Average age not listing hope	Difference
Law/Military use	48.46**	45.83**	F = 9.136, $p = .003$
Emergency medical use	52.18***	45.73***	F = 30.67, $p < .001$
Environment / Research	52.98***	45.97***	F = 22.16, $p < .001$
Service	45.62	46.91	F = 3.09, $p = .079$
Safety	46.16	46.49	F = 0.15, $p = .704$
Control	41.01**	46.66**	F = 10.63, $p = .001$
Fun / Recreational	43.36	46.46	F = 1.15, $p = .284$
No hopes (negative)	49.34**	46.00**	F = 9.22, $p = .002$
Don't know	45.14	46.46	F = 0.48, $p = .489$
Other	39.86***	46.81***	F = 20.34, $p < .001$

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; Bolded values represent higher values.

Hopes & Concerns by Race or Ethnicity. Participants could indicate more than one race or ethnicity category. Thus, race/ethnicity categories were not exclusive. To understand if those identifying as a particular race or ethnicity were more or less likely to indicate a concern or hope, we created two-by-two tables to compare those that did and did not select a concern (hope) (1,0), and those that did or did not identify as a particular race (1,0) and used a Pearson's chi-square test to determine if the differences were significant.

Results for the tests of concerns are shown in **Table 15**. Participants who identified as Asian were more likely to list concerns about accidents ($X^2 = 4.81, p = .03$) than those who did not identify as Asian. Participants who identified as white were more likely to list concerns about privacy ($X^2 = 5.89, p = .015$) and air traffic ($X^2 = 4.04, p = .044$), and less likely to say that they had no concerns ($X^2 = 3.97, p = .046$), than those who did not identify as white. Participants who identified as Black or African American were less likely to express concerns about reliability (X^2

= 4.09, $p = .043$); however, they were more likely to say that they weren't sure ($X^2 = 7.26, p = .007$) or had no concerns ($X^2 = 5.57, p = .018$). Those who identified as Hispanic or Latino, were more likely to list concerns about reliability ($X^2 = 7.75, p = .005$), economics ($X^2 = 10.14, p = .001$), and autonomy ($X^2 = 6.14, p = .013$), but less likely to list concerns about accidents ($X^2 = 3.98, p = .046$) and air traffic ($X^2 = 8.30, p = .004$), than those who did not identify as Hispanic or Latino.

Table 15. Percent Persons Listing Concerns by Race and Ethnicity

Concern	% White listing concern	% Black or African American listing concern	% Native Hawaiian or Other Pacific Islander listing concern	% Asian listing concern	% American Indian or Alaska Native listing concern	% Hispanic or Latino listing concern
Reliability	24.6 (25.0)	19.8*↓(25.4)	12.5 (24.7)	22.4 (24.8)	26.9 (24.7)	29.6**↑(23.3)
Accidents	31.7+↑(27.6)	26.0+↓(31.2)	37.5 (30.5)	39.7*↑(30.0)	15.4 (30.7)	26.8*↓(31.6)
Hijack	5.2 (4.5)	2.9 (5.3)	0 (5.0)	6.9 (4.9)	11.5 (4.9)	5.1 (4.9)
Misuse	23.1 (21.9)	24.9 (22.5)	25.0 (22.8)	21.6 (22.9)	23.1 (22.8)	20.2 (23.5)
Privacy	35.2*↑(29.6)	28.6+↓(34.4)	37.5 (33.6)	32.8 (33.7)	42.3 (33.5)	33.4 (33.7)
Economic	1.6 (2.6)	1.1 (2.0)	0 (1.9)	3.4 (1.8)	0 (1.9)	3.6**↑(1.4)
Autonomy	9.8 (11.6)	8.4 (10.6)	12.5 (10.3)	10.3 (10.3)	7.7 (10.4)	13.4**↑(9.5)
Air traffic	9.6*↑(6.8)	7.3 (9.1)	12.5 (8.8)	6.9 (9.0)	3.8 (8.9)	5.5**↓(9.8)
Don't know	1.1 (1.7)	2.9*↑(1.0)	0 (1.2)	0.9 (1.3)	3.8 (1.2)	0.6 (1.4)
No concerns	4.3*↓(6.3)	7.7*↑(4.4)	0 (4.9)	4.3 (4.9)	0 (4.9)	4.3 (5.0)
Other	12.2 (12.0)	12.8 (12.1)	0 (12.2)	9.5 (12.3)	11.5 (12.2)	12.3 (12.1)

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; + $p < .10$ significance levels for comparisons between those indicating a given race/ethnicity category (1) and those not indicating that race/ethnicity category (0). Values accompanied by a ↓ (↑) were significantly lower (higher) than persons not identifying with that race or ethnicity. Value in parens is the percent endorsement of persons not identifying with that race/ethnicity.

Participants who identified as Black or African American were less likely to list hopes for emergency medical use ($X^2 = 7.27, p = .007$) or “no hopes” ($X^2 = 4.61, p = .032$) than those not identifying as Black/African American.

Compared to those who did not identify as Hispanic/Latino, participants who identified as Hispanic or Latino were less likely to list hopes for emergency medical use ($X^2 = 4.55, p = .033$), environmental research ($X^2 = 5.76, p = .016$), or to say “don't know” ($X^2 = 4.35, p = .037$) regarding their hopes; but were more likely to list hopes for control ($X^2 = 8.97, p = .003$).

Participants who identified as White were more likely to list hopes for safety ($X^2 = 5.25, p = .022$), or say “don't know” regarding hopes ($X^2 = 4.03, p = .045$), and were not as likely to list hopes for Control ($X^2 = 6.36, p = .012$) as those not identifying as White.

Participants who identified as Asian were not as likely to state they have “no hopes” ($X^2 = 4.31, p = .038$). Participants who identified as American Indian or Alaska Native were marginally less likely to list “no hopes” as a hope ($X^2 = 3.64, p = .056$) (Table 16).

Table 16. Percent Persons Listing Hopes by Race and Ethnicity

Hopes	% White listing hope	% Black or African American listing hope	% Native Hawaiian or Other Pacific Islander listing hope	% Asian listing hope	% American Indian or Alaska Native listing hope	% Hispanic or Latino listing hope
Law/Military use	22.7 (19.9)	18.7 (22.4)	0 (22.0)	19.0 (22.0)	34.6 (21.7)	21.9 (21.9)
Emergency medical	11.2 (8.7)	5.9**↓(11.2)	25.0 (10.5)	10.3 (10.5)	7.7 (10.6)	7.9*↓(11.3)
Envir./Research	6.7 (4.8)	5.1 (6.3)	0 (6.2)	7.8 (6.1)	7.7 (6.2)	3.8*↓(6.9)
Service	39.0 (38.9)	34.8 (39.6)	50.0 (38.9)	44.0 (38.7)	34.6 (39.0)	41.1 (38.4)
Safety	25.3*↑(20.5)	20.1 (24.6)	12.5 (24.0)	25.9 (23.9)	34.6 (23.8)	23.6 (24.1)
Control	3.8*↓(6.3)	4.8 (4.5)	12.5 (4.5)	5.2 (4.5)	0 (4.6)	7.0**↑(3.8)
Fun / Recreational	1.6 (1.5)	1.8 (1.5)	0 (1.6)	0.9 (1.6)	0 (1.6)	2.1 (1.4)
No hopes (neg.)	11.9 (12.8)	16.1*↑(11.6)	12.5 (12.2)	6.0*↓(12.5)	0+↓(12.3)	11.3 (12.4)
Don't know	4.3*↑(2.4)	3.7 (3.7)	12.5 (3.7)	0.9 (3.9)	0 (3.8)	2.1*↓(4.2)
Other	5.2+↓(7.2)	5.1 (5.8)	0 (5.8)	6.0 (5.7)	7.7 (5.7)	7.4+↑(5.3)

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; + $p < .10$ significance levels for comparisons between those indicating a given race/ethnicity category (1) and those not indicating that race/ethnicity category (0). Values accompanied by a ↓ (↑) were significantly lower (higher) than persons not identifying with that race or ethnicity.

Hopes & Concern by Political Party. Participants were asked to rate which political party with which they identified, ranging from (1) “strong democrat” to (7) “strong republican.” Those listing privacy and air traffic concerns on average leaned more Republican. Those listing Law/Military Use hopes also leaned more Republican than those who did not list these concerns. Meanwhile those listing “Other” hopes leaned toward the Democrat end of the spectrum compared to those who did not list other concerns.

Table 17. Means (M) and Standard Deviations (SD) of Political Party Identification (1=Strong Democrat, 7=Strong Republican) by Concerns

Concern	Those listing concern		Those not listing concern		Difference
	M	SD	M	SD	
Reliability	3.71	1.71	3.73	1.80	F = 0.05, $p = .850$
Accidents	3.80	1.78	3.69	1.77	F = 1.73, $p = .189$
Hijack	3.87	1.68	3.71	1.78	F = 0.71, $p = .400$
Misuse	3.72	1.74	3.72	1.79	F = 0.003, $p = .957$
Privacy	3.88**	1.79	3.64**	1.76	F = 8.13, $p = .004$
Economic	3.74	1.78	3.72	1.43	F = 0.01, $p = .940$
Autonomy / Pilot	3.65	1.75	3.73	1.78	F = 0.42, $p = .517$
Air traffic	4.03*	1.87	3.69*	1.77	F = 6.20, $p = .013$
Don't know	3.42	2.00	3.73	1.77	F = 0.75, $p = .388$
No concerns	3.61	1.94	3.73	1.77	F = 0.40, $p = .529$
Other	3.42	1.78	3.73	1.73	F = 0.75, $p = .39$

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; degrees of freedom = 1, 2087; Bolded values represent higher values. Rated on a scale of 1 (strong democrat) to 7 (strong republican).

Table 18. Average Political Party (1=Strong Democrat, 7=Strong Republican) by Hopes

Hope	Those listing hope	Those not listing hope	Difference
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	M	SD	M	SD	
Law/Military use	3.98***	1.84	3.65**	1.75	F = 12.19, <i>p</i> < .001
Emergency medical	3.71	1.81	3.82	1.77	F = 0.79, <i>p</i> = .376
Environment / Research	3.69	1.90	3.72	1.77	F = 0.05, <i>p</i> = .831
Service	3.71	1.70	3.73	1.82	F = 0.13, <i>p</i> = .724
Safety	3.79	1.76	3.70	1.78	F = 0.97, <i>p</i> = .325
Control	3.65	1.69	3.73	1.78	F = 0.17, <i>p</i> = .682
Fun / Recreational	3.64	1.77	3.72	1.78	F = 0.08, <i>p</i> = .779
No hopes (negative)	3.76	1.91	3.72	1.76	F = 0.10, <i>p</i> = .748
Don't know	3.58	1.81	3.73	1.78	F = 0.54, <i>p</i> = .461
Other	3.30**	1.66	3.75**	1.78	F = 7.22, <i>p</i> = .007

Notes. **p* < .05, ***p* < .01, ****p* < .001; degrees of freedom = 1, 2087; Bolded values represent higher values. Rated on a scale of 1 (strongly liberal) to 7 (strongly conservative).

Hopes & Concerns by Ideology. When it came to self-reported ideology, those listing concerns about reliability and those listing “other” concerns leaned more liberal. Meanwhile those listing concerns for air traffic, or stating they had no concerns, leaned more conservative. Those listing law/military hopes or stating they had no hopes, leaned more conservative. Meanwhile those with environment / research hopes leaned more liberal.

Table 19. Ideology by Concerns

Concern	Mean of those listing concern	Mean of those not listing concern	Difference
Reliability	3.92*	4.14*	F = 5.60, <i>p</i> = .018
Accidents	4.08	4.08	F = .001, <i>p</i> = .969
Hijack	4.05	4.08	F = 0.04, <i>p</i> = .843
Misuse	3.97	4.12	F = 2.43, <i>p</i> = .119
Privacy	4.17	4.04	F = 2.44, <i>p</i> = .119
Economic	3.67	4.09	F = 2.09, <i>p</i> = .148
Autonomy / Pilot	4.08	4.08	F = .000, <i>p</i> = .993
Air traffic	4.33+	4.06+	F = 3.79, <i>p</i> = .052
Don't know	3.96	4.08	F = 0.12, <i>p</i> = .733
No concerns	4.45*	4.06*	F = 4.27, <i>p</i> = .04
Other	3.86*	4.11*	F = 4.43, <i>p</i> = .036

Notes. **p* < .05, ***p* < .01, ****p* < .001; Bolded values represent higher values. Rated on a scale of 1 (strongly liberal) to 7 (strongly conservative).

Table 20. Ideology by Hopes

Hope	Mean of those listing hope	Mean of those not listing hope	Difference
Law/Military use	4.33**	4.01**	F = 10.81, <i>p</i> = .001
Emergency medical	4.02	4.09	F = 0.31, <i>p</i> = .579
Environment / Research	3.72*	4.11*	F = 5.49, <i>p</i> = .019
Service	3.99	4.14	F = 3.18, <i>p</i> = .075
Safety	4.04	4.09	F = 0.03, <i>p</i> = .586
Control	4.23	4.08	F = 0.69, <i>p</i> = .407
Fun / Recreational	3.85	4.09	F = 0.56, <i>p</i> = .455
No hopes (negative)	4.35*	4.05*	F = 6.15, <i>p</i> = .013

Hope	Mean of those listing hope	Mean of those not listing hope	Difference
Don't know	4.09	4.08	F = .001, $p = .971$
Other	3.88	4.09	F = 1.54, $p = .216$

Notes. * $p < .05$, ** $p < .01$, *** $p < .001$; Bolded values represent higher values. Rated on a scale of 1 (strongly liberal) to 7 (strongly conservative).

Hopes & Concerns by Term. We also tested whether concerns and hopes listed differed by terminology used. To test this, we first conducted a chi-square analysis for each single hope/concern (coded as 0/1 for not listed or listed) x terminology (4 groups). In cases where the overall chi-square was statistically significant, we conducted follow up oneway ANOVA analyses using the 0/1 (not listed/listed) variable as the dependent variable and term as the predictor, and examining the follow up pairwise comparisons between terms using the least significant difference (LSD) test.⁴

Table 21. Concern by Term

Concern	Drone (a)	UAV (b)	UAS (c)	Aerial robot (d)	Omnibus difference test
Reliability	11.4%	30.2% ^a	30.2% ^a	27.8% ^a	***F = 24.34, $p < .001$
Accidents	26.7%	34.0%	31.9%	29.8%	+F = 2.42, $p = .064$
Hijack	2.0%	6.6% ^a	7.2% ^{a, d}	4.4%	***F = 6.13, $p < .001$
Misuse	31.3% ^{b, c, d}	18.2%	24.7% ^{b, d}	17.1%	***F = 13.44, $p < .001$
Privacy	51.7% ^{b, c, d}	24.2%	27.7%	30.0% ^b	***F = 39.28, $p < .001$
Economic	0.9%	2.1%	2.3%	2.2%	F = 1.23, $p = .297$
Autonomy / Pilot	5.9%	13.1% ^a	12.6% ^a	10.1% ^a	***F = 6.24, $p < .001$
Air traffic	11.6% ^{b, c}	7.9%	6.6%	9.0%	*F = 2.91, $p = .034$
Don't know	0.7%	1.5%	1.5%	1.3%	F = .55, $p = .646$
No concerns	5.0%	4.5%	3.4%	6.3%	F = 1.55, $p = .200$
Other	12.0%	13.9%	11.7%	11.0%	F = .74, $p = .529$

Notes. Superscripts indicate if pairwise comparisons indicated a value is significantly ($p < .05$) more than the value in the lettered column: e.g., superscript "a" denotes a significant difference from the value in the drone (a) column. For readability, only the larger of the two values has the superscript such that 'a' indicates a value > the drones value, 'b' > UAV, 'c' > UAS, 'd' > Aerial Robot. Bolded values are numerically largest for the given comparison(s).

A number of differences coincided with the use of different terminology on the surveys (see **Table 21** and **Table 22**). For example, those answering the survey using the term "drone" tended to be most likely to list concerns around misuses, privacy, and air traffic; and to list hopes for law/military use and service uses. However, "drones" survey takers were least likely to list concerns about reliability and autonomy. Those viewing the survey using the term "UAV" or "UAS" tended to be more likely to list concerns about hijacking and hopes for safety, and less likely to list hopes for service uses, compared to those receiving the "drones" or "aerial robot"

⁴ We used the pairwise ANOVA follow-ups for efficiency, but the p-values are identical to the outcomes if we had use pairwise chi-square analyses due to the properties of 0/1 variables.

terms. Compared to those receiving other terms, those receiving the survey with the term “aerial robot” were more likely to list hopes for emergency medical uses.

Table 22. Hope by Term

Hope	Drone (a)	UAV (b)	UAS (c)	Aerial robot (d)	Omnibus difference test
Law/Military use	27.4% ^{b,c,d}	20.1%	22.3%	17.7%	***F = 5.53, <i>p</i> < .001
Emergency medical use	11.4%	9.0%	8.3%	13.1% ^{b,c}	*F = 2.67, <i>p</i> = .046
Environment / Research	7.0%	6.4%	6.2%	5.2%	F = .55, <i>p</i> = .650
Service	45.7% ^{b,c}	34.1%	33.8%	41.4% ^{b,c}	***F = 7.425, <i>p</i> < .001
Safety	17.5%	27.4% ^{a,d}	31.1% ^{a,d}	21.0%	***F = 10.65, <i>p</i> < .001
Control	1.8%	6.0% ^a	4.5% ^a	5.7% ^a	**F = 4.55, <i>p</i> = .003
Fun / Recreational use	2.6%	1.3%	1.1%	1.3%	F = 1.61, <i>p</i> = .185
No hopes (negative)	10.1%	12.4%	13.0%	13.3%	F = 1.01, <i>p</i> = .387
Don't know	2.9%	4.5%	3.6%	3.9%	F = .62, <i>p</i> = .603
Other	4.8%	5.3%	7.7%	5.5%	F = 1.46, <i>p</i> = .223

Notes. Superscripts indicate if pairwise comparisons indicated a value is significantly (*p* < .05) more than the value in the lettered column: e.g., superscript “a” denotes a significant difference from the value in the drone (a) column. For readability, only the larger of the two values has the superscript such that ‘a’ indicates a value > the drones value, ‘b’ > UAV, ‘c’ > UAS, ‘d’ > Aerial Robot. Bolded values are numerically largest.

Main Effects of Time

We next tested for any overall effects of time on our primary dependent variables (the trust and support variables). For these tests, we used the entire data set⁵ and multiple regression procedures in which year of the survey was used as the predictor representing time, and the model controlled for demographics (race, age, gender, overall political ideology), source of the sample (MTurk vs. Qualtrics), and all experimental conditions (main effects only). As shown in **Table 23**, the effects, when found, were small. Nonetheless, results indicated samples in later years of the survey expressed more trust in the actors using the technologies, in those regulating it, and in the technologies themselves. However, they did not express more support for the technologies overall.

Using the same control variables and multiple regression model, we tested for the effects of time on variables that might indicate greater awareness of the technologies, including participant-rated subjective knowledge, as well as objective knowledge of the technologies, and upon recognition (whether they indicated having heard of the technologies) and technology time horizon (judgement of “how long” before the technologies would be used as described in the scenarios). As shown in the bottom half of **Table 23**, the findings seemed somewhat counterintuitive in that there appeared to be no impact of year on subjective knowledge, a very

⁵ We also examined the effects using data only from the Qualtrics samples and the patterns were similar.

slight positive effect on having heard of the technologies, and there appeared to be overall *negative* effects of year on objective knowledge (such that later samples got fewer questions correct) and *positive effects* on anticipated time horizon for use of the technologies (such that later samples gave even longer estimates for when the technologies might be used as described in the scenarios).

Table 23. Main Effect of Year on Primary Dependent Variables and Awareness Variables

Dependent variable, predictor	B	SE	Beta	t	sig.	Zero-order	Partial	Part
Support/Trust								
Support, year	0.015	0.016	0.013	0.880	0.379	0.036	0.010	0.010
Trust actors, year	0.040	0.010	0.061	3.892***	0.000	0.097	0.046	0.045
Trust reg., year	0.056	0.014	0.062	4.112***	0.000	0.059	0.051	0.051
Trust UATs, year	0.032	0.009	0.052	3.417**	0.001	0.075	0.043	0.042
Awareness/Knowledge								
Subj. know., year	0.009	0.011	0.011	0.777	0.437	0.064	0.010	0.009
Obj. know., year	-0.053	0.014	-0.060	-3.938***	0.000	-0.074	-0.049	-0.049
Have heard, year	0.018	0.008	0.028	2.106*	0.035	-0.021	0.025	0.021
How long, year	0.061	0.013	0.073	4.695***	0.000	0.025	0.055	0.054

Notes. **p < .01, ***p < .001 significance (sig.) levels. B and SE are the unstandardized parameter estimates for year predicting the dependent variable listed; Beta is the standardized estimate. Also presented are the simple (zero-order), partial and part correlations from the full regression equations. Parameter estimates were computed in the context of a single multiple regression model containing control variables for sample source (MTurk or Qualtrics), demographics (age, gender, 6 race variables, and ideology (scale), and dummy variables representing all experimental condition main effects (term, actor, autonomy, purpose, framing).

Conditional Effects of Time

We took our examination of time one step further by also asking whether any of the experimentally varied factors moderated the effects of time. It seemed reasonable for example, that the effect of time on the awareness and knowledge variables might be impacted by terminology used to describe the technologies, and that the purpose of the technology might impact changes in support. To investigate such potential interactions we use hierarchical regression procedures in which the same control variables and a year variable were entered in step 1 and variables representing the interaction between year and one of the experimentally varied factors was entered in step 2. For these analyses, year was recoded to be centered at 2016 (= 0) and each of the other years were increasing positive or negative integers (2019 = +3, 2018 = +2, 2015 = -1; 2014 = -2). The interaction terms were created by multiplying the centered year variable (year2016) by the dummy-coded variables representing each experimental main effect. Because the “science” purpose was only administered in 2019 and thus could not be gauged over time, analyses investigating time x purpose interaction were conducted only on the subset of the entire sample that was not in the science purpose condition.

Conditional time effects upon support. As show in Table 24, changes over time predicting support did vary slightly across experimentally manipulated *purposes*, and (marginally) across conditions using different *terminology* for the technologies.

Examination of the impact of survey year in separate purpose conditions found year was positively predictive of support in the security purpose condition ($B = .098$, $SE = .025$, $Beta = .086$, $p < .001$), but not predictive of increasing support in the other conditions. This finding may reflect a regression to the mean given that support in each sample typically showed least support for security purposes.

Although the interaction between year and terminology did not overall account for significant variance in the model, examination of changes over time in support for each of the terminology conditions indicated that, when the term “drone” was used in the survey materials, there was a small but significant positive effect of time ($B = .104$, $SE = .026$, $Beta = .095$, $p < .001$) on support. However, use of any of the other terms reduced this effect. The UAS and UAV terms had larger differences from the drone condition than did the aerial robot term (interaction term = $-.07$ less for B , $Beta$ change = $-.030$, and the difference significant at $p = .05$). This finding suggests that when the technologies are referred to as “drones” (which is the most familiar term to people), support for the technologies has slightly increased over time.

Table 24. Moderation of Time (year) Effect on Rated Support for the Technology

	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Support model 1 ^a	.278 ^a	0.077	0.075	1.537	0.077***	28.863	20	6896	0.000
add year x purpose	.283 ^b	0.080	0.077	1.535	0.003***	10.231	2	6894	0.000
Support model 2 ^b	.276 ^a	0.076	0.073	1.54	0.076***	29.735	20	7237	0.000
add year x term	.277 ^b	0.077	0.074	1.54	0.001	1.768	3	7234	0.151
add year x actor	.276 ^b	0.076	0.073	1.54	0.000	0.298	1	7236	0.585
add year x auton.	.276 ^b	0.076	0.074	1.54	0.000	1.536	2	7235	0.215
add year x framing	.276 ^b	0.076	0.073	1.54	0.000	1.134	1	7236	0.287

Notes. *** $p < .001$ significance (sig.) levels. ^aModel run on subset of data not including persons in the 2019 science purpose condition. ^bModel run on all data. Each of the interactions were tested alone (not simultaneously) by adding the terms to the initial model and then examining R-square change.

Conditional time effects upon trust variables. Using the same hierarchical multiple regression procedures, we also examined whether the effect of year on trust in the technologies, trust in actors using the technologies, and trust in regulators overseeing the technologies varied by condition. From our examination of 2-way interactions involving time and the experimentally varied factors, we found no evidence that the effects of time on trust varied over the experimental conditions. This indicates, for example, that trust in actors using the technologies increased similarly over time regardless whether the actor was a public (government) or private

business user. Likewise, that trust in regulators increased over time regardless of purpose, autonomy, or terminology.

Conditional time effects upon knowledge and awareness variables. Examination of the two way interactions between time and experimental conditions on the awareness variables revealed a few significant effects. First, there were no significant interactive effects predicting objective knowledge. However, when predicting subjective knowledge, the impact of time depended on the actor portrayed as involved in the scenario. When in the “public” (government) condition there was no effect of year on subjective knowledge. However, in the “private” (business) condition the effect of year on subjective knowledge was positive ($B = .043$) and significantly more positive than in the public condition (interaction term was $+0.052$ more for B , $Beta$ change = $+0.054$, and the difference significant at $p = .004$).

When predicting the ordinal variable reflecting if a person had heard of the technology (0 = no, 1 = unsure, 2 = yes), the effect of time depended on the terminology used. When the term “drone” or “aerial robot” was used, year had a slight positive effect on having heard of the technology (drone: $B = .056$, $SE = .013$, $Beta = .089$, $p < .001$; aerial robot: $B = .046$, $SE = .013$, $Beta = .073$, $p = .001$). However, for the UAV and UAS terminology conditions the effect of year was significantly less and not significant (UAS: $B = -.007$, $SE = .014$, $Beta = -.012$, $p = .589$; UAV: $B = -.024$, $SE = .014$, $Beta = -.039$, $p = .079$). This may indicate that the public is becoming relatively more aware of these technologies when referred to as drones or aerial robots, but have not become more aware of them being referenced as UAVs or UASs.

Finally, when predicting perceptions of the time horizon for use of the technologies (“how long” before the technologies would be used as described in the scenarios), the effect of time (year) once again depended upon the terminology used to describe the technology, and also depended on the framing of the description of the technology purpose, and (marginally) upon purpose. With regard to purpose, for the security and environmental purposes, year positively predicted increasing “how long” estimates (respective B s = $.059$, $.091$, SE s = $.020$, $.020$, $Betas$ = $.066$, $.103$, p s = $.003$, $<.001$), but for the economic purpose the effect was smaller and only marginally significant ($B = .035$, $SE = .020$, $Beta = .039$, $p < .076$). When the more familiar term “drone” was used, year did not have a significant impact on the “how long” estimates ($p = .522$). In each of the other term conditions, the impact of year was positive and marginally or statistically significant. Somewhat counterintuitively, the “how long” estimates increased each year rather than decreased, as shown by the positive parameter estimates for year in **Table 25**. In addition, year had a marginally larger significant positive effect on “how long” estimates when the technology purposes were framed using prevention (rather than promotion) language ($B = .064$, $SE = .016$, $Beta = .076$, $p < .001$), and a marginally smaller effect ($B = .028$, difference statistics: $B = -.036$, $SE = .019$, $Beta = -.031$, $p = .064$) when framed using promotion language.

Table 25. Parameter Estimates for the Main and Interactive Effects of Year and Term on Estimates of "How Long" Before Technology Will Be Used as Described in the Scenarios

Predictor Variable	B	SE	Beta	t	sig.	Zero-order	Partial	Part
UAS_cond	0.097	0.044	0.033	2.212*	0.027	-0.007	0.026	0.025
UAV_cond	0.171	0.043	0.060	3.965***	0.000	0.020	0.047	0.045
AR_cond	0.207	0.043	0.073	4.797***	0.000	0.057	0.056	0.055
<i>year2016 (drone)</i>	-0.013	0.020	-0.016	-0.640	0.522	0.025	-0.008	-0.007
year_uas_int	0.079	0.027	0.049	2.901**	0.004	0.021	0.034	0.033
year_uav_int	0.051	0.028	0.031	1.861+	0.063	0.011	0.022	0.021
year_ar_int	0.106	0.027	0.069	3.969***	0.000	0.062	0.047	0.046
<i>year2016 (UAS)</i>	0.066	0.021	0.078	3.118**	0.002	0.025	0.037	0.036
<i>year2016 (UAV)</i>	0.038	0.021	0.045	1.778+	0.075	0.025	0.021	0.020
<i>year2016 (AR)</i>	0.093	0.020	0.111	4.563***	0.000	0.025	0.054	0.052

Notes. + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$ significance (sig.) levels. B and SE are the unstandardized parameter estimates for the listed predictor variables predicting "how long" variable; Beta is the standardized estimate. Also presented are the simple (zero-order), partial and part correlations from the full regression equations. Parameter estimates computed in the context of a multiple regression model containing control variables (described in text), as well as the variables representing the interactions between year and term. Italicized parameters for year under different terminology conditions were computed by re-running the model with different reference categories.

Analyses of Experimentally Varied Factors

Next, we tested for main effects of our independent variables upon our primary dependent variables, in the entire data set as a whole, as well as within each sample. To examine these main effects we first used the same multiple regression procedure as we had used to examine the main effect of time. That is, we conducted regression procedures on the entire data set, controlling for year of survey, demographics (race, age, gender, overall political ideology), source of the sample (MTurk vs. Qualtrics), and all other experimental factors (main effects only). The dummy code(s) representing the main effect of interest was entered last and R-square change statistics were examined to see if the main effect accounted for statistically significant amount of independent variance. Finally, to examine the robustness of our results, we tested for the same main effects for each of the six individual samples.

Main effects of TERM used to describe the technology. As shown in Table 26, examination of the main effects of terminology found a significant effect on *support for the technology*, with the term "drone" associated with the most support, followed by the term "aerial robot," and then the terms "UAV" and "UAS." Although the time (year) x term interaction was not statistically significant, the reader may recall that it appeared that support slightly improved over time when the term "drone" was used, but not when other terms were used. Consistent with that observation, examination of the main effect of terminology in each sample separately only found significant or marginal effects of terminology on support in the later Qualtrics samples

(samples 5 and 6, in 2018 and 2019) and not in the earlier MTurk samples. In both samples 5 and 6, UAS and UAV (and less reliably aerial robot) was associated with less support than the use of the term “drone.”

Table 26. Main Effect of Terminology on Primary Dependent Variables

Dependent Variable, Predictor set									
<i>Individual predictors (if predictor set resulted in significant F-change)</i>									
Support and Trust									
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Support, term	.293	0.086	0.083	1.530	0.002**	4.392	3	7236	0.004
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>		<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>
<i>UAS_cond</i>	-0.161	0.054	-0.043	-2.959**	0.003		-0.013	-0.037	-0.036
<i>UAV_cond</i>	-0.171	0.053	-0.046	-3.198**	0.001		-0.028	-0.040	-0.038
<i>AR_cond</i>	-0.102	0.053	-0.028	-1.930+	0.054		-0.002	-0.024	-0.023
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Trust actors, term	.179	0.032	0.029	0.947	0.000	1.200	3	7236	0.308
Trust reg., term	.181	0.033	0.030	1.119	0.000	0.287	3	6359	0.835
Trust UATs, term	.136	0.018	0.015	0.772	0.000	0.304	3	6359	0.823
Awareness and Knowledge									
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Subj. know., term	.292	0.085	0.082	0.91814	0.018***	41.05	3	6359	0.000
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>		<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>
<i>UAS_cond</i>	-0.317	0.033	-0.140	-9.671***	0.000		-0.061	-0.120	-0.116
<i>UAV_cond</i>	-0.262	0.032	-0.118	-8.127***	0.000		-0.032	-0.101	-0.097
<i>AR_cond</i>	-0.284	0.032	-0.129	-8.891***	0.000		-0.045	-0.111	-0.107
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Obj. know., term	.147	0.022	0.018	1.112	0.002**	4.059	3	6359	0.007
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>		<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>
<i>UAS_cond</i>	-0.125	0.040	-0.047	-3.161**	0.002		-0.023	-0.040	-0.039
<i>UAV_cond</i>	-0.107	0.039	-0.041	-2.732**	0.006		-0.010	-0.034	-0.034
<i>AR_cond</i>	-0.091	0.039	-0.035	-2.343*	0.019		-0.009	-0.029	-0.029
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Have heard, term	.532	0.283	0.281	0.783	0.248***	834.6	3	7236	0.000
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>		<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>
<i>UAS_cond</i>	-1.100	0.026	-0.505	-42.098***	0.000		-0.219	-0.444	-0.419
<i>UAV_cond</i>	-0.751	0.026	-0.351	-29.119***	0.000		-0.011	-0.324	-0.290

	-1.124	0.026	-0.531	-43.976***	0.000	-0.253	-0.459	-0.438	
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
How long, term	.218	0.047	0.045	1.212	0.007***	17.76	3	7236	0.000
	B	SE	Beta	t	sig.	Zero-order	Partial	Part	
UAS_cond	0.149	0.040	0.051	3.690***	0.000	-0.007	0.043	0.042	
UAV_cond	0.204	0.040	0.071	5.121***	0.000	0.020	0.060	0.059	
AR_cond	0.278	0.040	0.098	7.035***	0.000	0.057	0.082	0.081	

Notes. + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$ significance (sig.) levels. B and SE are the unstandardized parameter estimates for the listed predictor variables predicting the dependent variable; Beta is the standardized estimate. Also presented are the simple (zero-order), partial and part correlations from the full regression equations. Parameter estimates computed in the context of a multiple regression models described in text. Each parameter estimate is relative to the reference category (in this case, drone).

Terminology did not have a significant main effect on *trust in the actors* using the technology, *trust in the regulators* of the technology, or *trust in the technologies*, regardless whether the effect was tested in the entire population or each sample separately.

Terminology did impact people’s self-reported *subjective knowledge* such that subjective knowledge was highest when the term “drone” was used and significantly lower when each of the other terms were used in the survey. This finding was also significant in each of the individual samples in which subjective knowledge was measured (see **Figure 2**). A similar pattern was observed for *objective knowledge*, in the overall data (see **Figure 3**). However, examination of each of the samples separately found the effect was only statistically significant in the 2018 sample, marginally significant in the 2016 Qualtrics sample, and not significant in the other samples.

Figure 2. Main Effect of Terminology on Subjective Knowledge (by Sample)

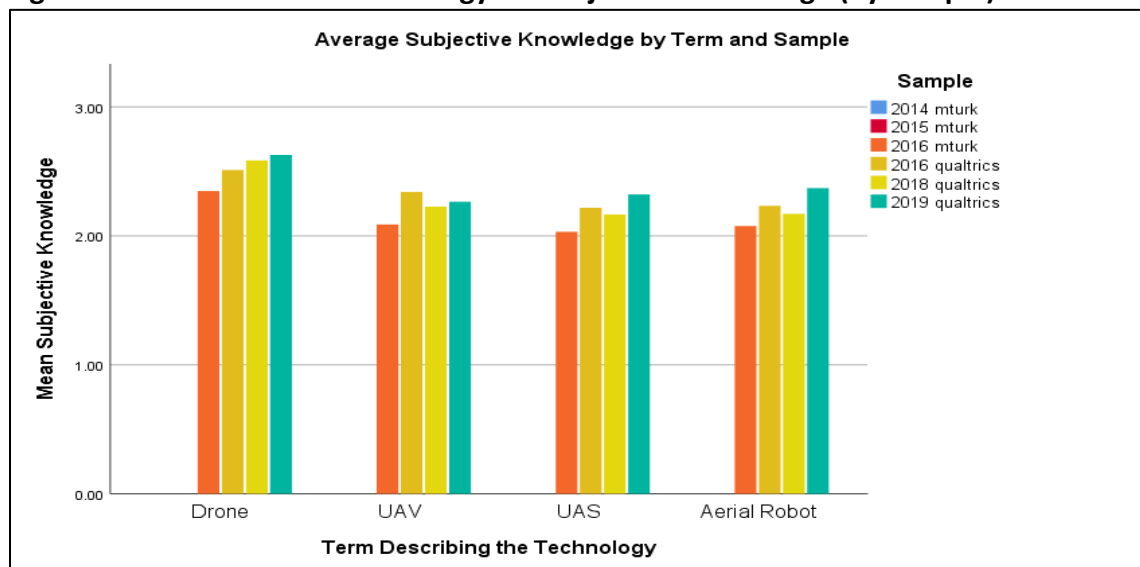
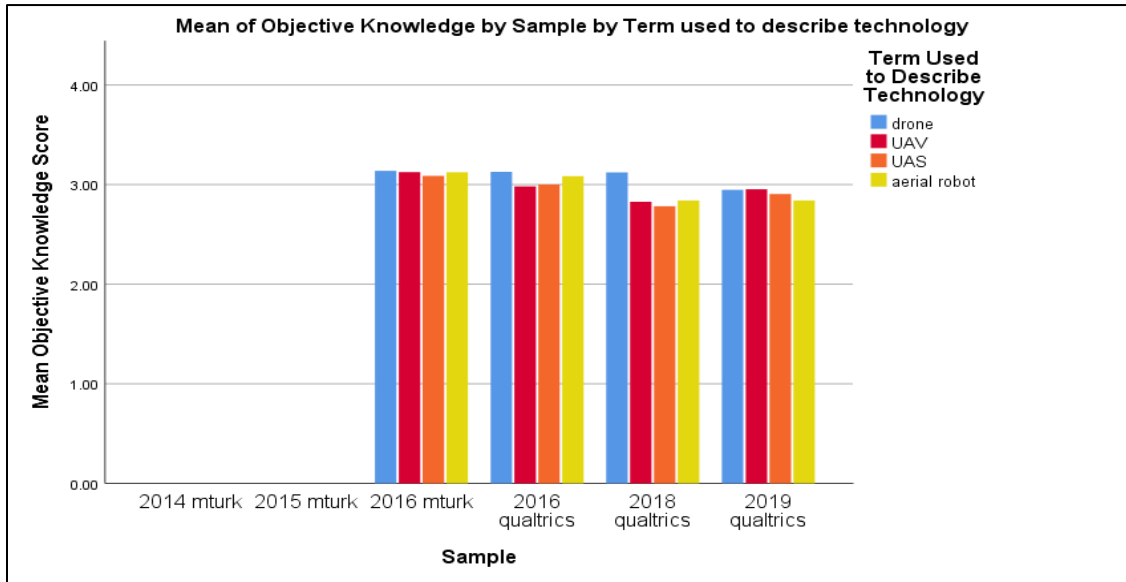


Figure 3. Main Effect of Terminology on Objective Knowledge



Terminology had a very strong effect on whether or not people indicated *having heard of* the technology (see **Figure 4**), accounting for almost 25% of the variance in the “have heard” ordinal variable. It also was strongly predictive for each of the samples when tested individually, always accounting for 20% or more of the variance. Again, drone was by far the most familiar term. “UAV” was the second most familiar.

Figure 4. Effect of Terminology on Average Report of Having Heard of the Technology

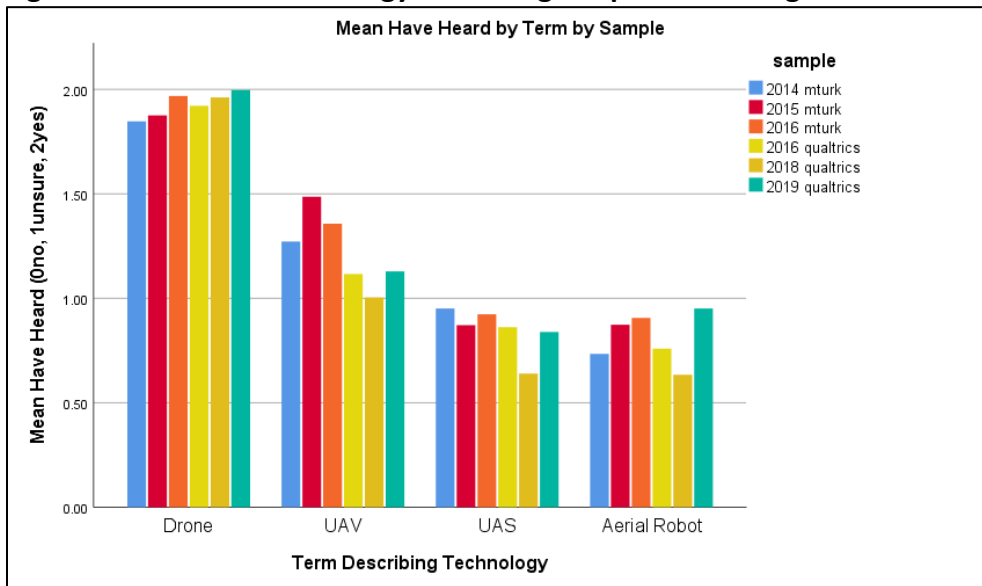
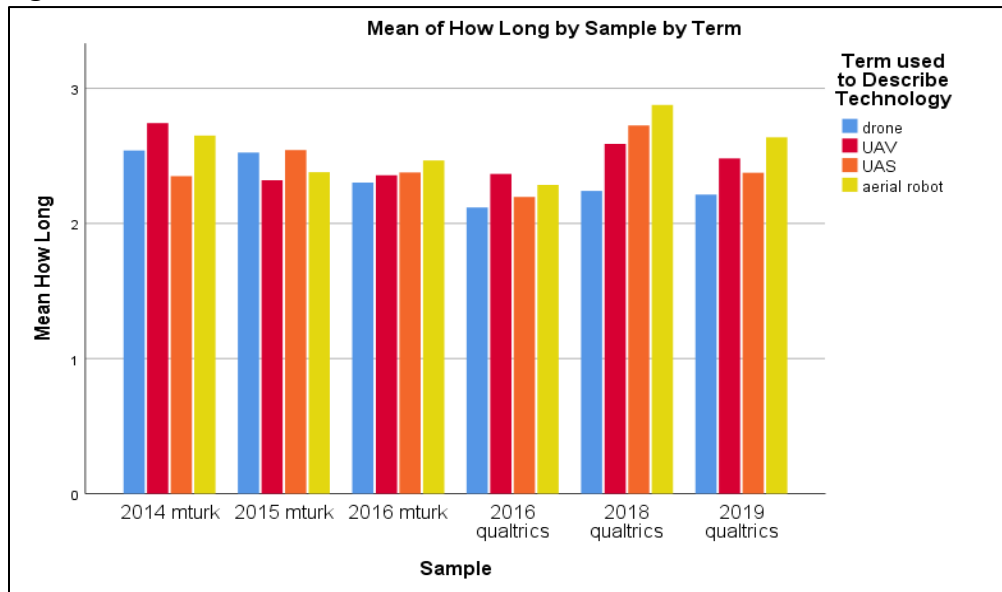


Figure 5. Effect of Term on Estimated Time Horizon for Use



Finally, terminology also had a small but significant effect on participant estimates of *how long* it would be before the technology was used in the manner described by the scenario. The pattern of the effect was that a shorter time horizon was given when the term “drone” was used rather than when each of the other terms were used. When tested in each sample individually, the effect was significant only in the last two Qualtrics samples and strongest in 2018, accounting for 4% of the variance that year (see **Figure 5**).

Main effects of PURPOSE of the technology. As shown in **Table 27**, the purpose of the technology had a moderate effect on support for technology, with the greatest support registering for weather forecasting purposes (the comparison group), followed by environmental purposes, then economic purposes, and last security purposes. These results were fairly robust across the individual samples, as purpose always accounted for significant variance in support (ranging from 2% to 12% of the variance) and environmental or weather purposes always garnered the greatest support (see **Figure 6**).

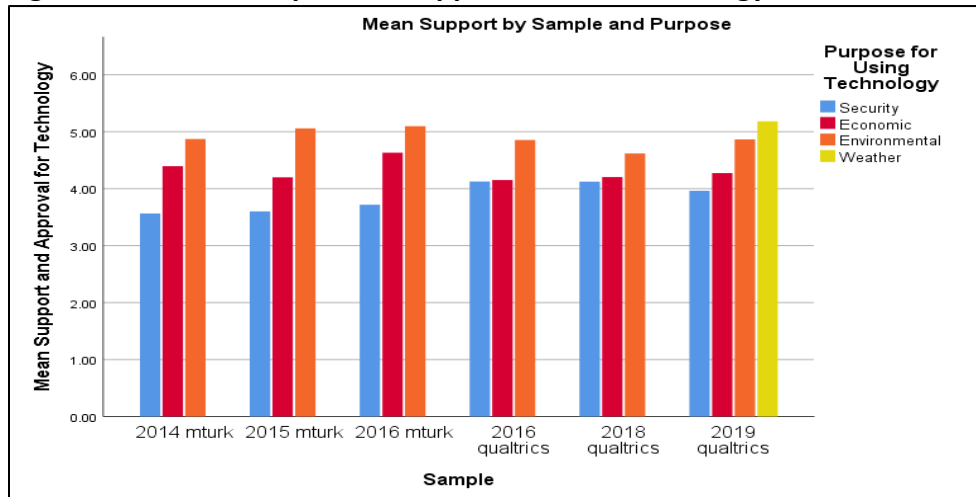
Table 27. Main Effect of Purpose on Primary Dependent Variables

Dependent Variable, Predictor set									
<i>Individual predictors (if predictor set resulted in significant F-change)</i>									
Support/Trust DVs									
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Support, purpose	.293	0.086	0.083	1.530	0.069***	182.9	3	7236	0.000
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Security</i>	-1.254	0.095	-0.365	-13.23***	0.000	-0.215	-0.154	-0.149	

<i>Environment</i>	-0.277	0.095	-0.081	-2.925**	0.003	0.204	-0.034	-0.033	
<i>Economic</i>	-0.833	0.095	-0.242	-8.772***	0.000	-0.037	-0.103	-0.099	
	R	R²	Adj. R²	Std. Error	R² Chg	F Chg	df1	df2	Sig. F Chg
Trust actors, purpose	.179	0.032	0.029	0.947	0.0128***	30.71	3	7236	0.000
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Security</i>	-0.408	0.059	-0.197	-6.955***	0.000	-0.092	-0.081	-0.080	
<i>Environment</i>	-0.184	0.059	-0.089	-3.139**	0.002	0.066	-0.037	-0.036	
<i>Economic</i>	-0.297	0.059	-0.144	-5.054***	0.000	-0.016	-0.059	-0.058	
	R	R²	Adj. R²	Std. Error	R² Chg	F Chg	df1	df2	Sig. F Chg
Trust reg., purpose	.181	0.033	0.030	1.119	0.015***	33.56	3	6359	0.000
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Security</i>	-0.565	0.071	-0.231	-8.006***	0.000	-0.094	-0.100	-0.099	
<i>Environment</i>	-0.295	0.071	-0.122	-4.183***	0.000	0.066	-0.052	-0.052	
<i>Economic</i>	-0.442	0.071	-0.180	-6.253***	0.000	-0.020	-0.078	-0.077	
	R	R²	Adj. R²	Std. Error	R² Chg	F Chg	df1	df2	Sig. F Chg
Trust UATs, purpose	.136	0.018	0.015	0.772	0.007***	14.87	3	6359	0.000
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Security</i>	-0.278	0.049	-0.166	-5.705***	0.000	-0.056	-0.071	-0.071	
<i>Environment</i>	-0.170	0.049	-0.102	-3.487***	0.000	0.038	-0.044	-0.043	
<i>Economic</i>	-0.239	0.049	-0.142	-4.904***	0.000	-0.024	-0.061	-0.061	
Awareness/Knowledge									
	R	R²	Adj. R²	Std. Error	R² Chg	F Chg	df1	df2	Sig. F Chg
Subj. know., purpose	.292	0.085	0.082	0.918	0.001	1.844	3	6359	0.137
Obj. know., purpose	.147	0.022	0.018	1.112	0.000	0.274	3	6359	0.844
How long, purpose	.218b	0.047	0.045	1.212	0.003***	8.174	3	7236	0.000
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Security</i>	0.211	0.075	0.079	2.817**	0.005	0.004	0.033	0.032	
<i>Environment</i>	0.141	0.075	0.053	1.876+	0.061	-0.037	0.022	0.022	
<i>Economic</i>	0.284	0.075	0.106	3.772***	0.000	0.043	0.044	0.043	

Notes. + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$ significance (sig.) levels. B and SE are the unstandardized parameter estimates for the listed predictor variables predicting the dependent variable; Beta is the standardized estimate. Also presented are the simple (zero-order), partial and part correlations from the full regression equations. Parameter estimates computed in the context of a multiple regression models described in text. Each parameter estimate is relative to the reference category (in this case, weather purpose).

Figure 6. Effect of Purpose on Support for the Technology



Purpose also had a small but significant effect on trust in the actor using the technology, accounting for 1.2% of the variance overall, and between .3% (in 2016 Qualtrics sample) to 3.0% (in 2019) of the independent variance in each individual sample. The pattern of the interaction was relatively consistent and similar to the pattern seen for support: Security purposes tended to result in the least trust in actors and environmental and weather purposes resulted in the most trust in actors (see **Figure 7**). Similarly, purpose had a small but significant effect on trust in regulators (accounting for 1.5% of independent variance overall), and trust in UATs (.7% of variance overall), with a similar patterns such that security purposes typically resulted in the least trust in the technologies while environmental and weather purposes resulted in the greatest trust. It thus appeared that purpose had a “halo effect” such that preferred purposes results in greater positive evaluations generally, including evaluations of support and trust in all entities involved (UATs, regulators, and actors); with the smallest effect being on trust in the UATs themselves.

Finally, purpose of technology did not impact subjective or objective knowledge, but did have a very small but significant effect on estimated time horizon for use of the technology (accounting for only .3% of independent variance). Generally speaking, when effects were found, there was a tendency across the samples for people to judge economic uses as likely to occur furthest in the future, weather or environmental purposes as likely to occur soonest (see **Figure 8**).

Figure 7. Effect of Purpose on Trust in Actor

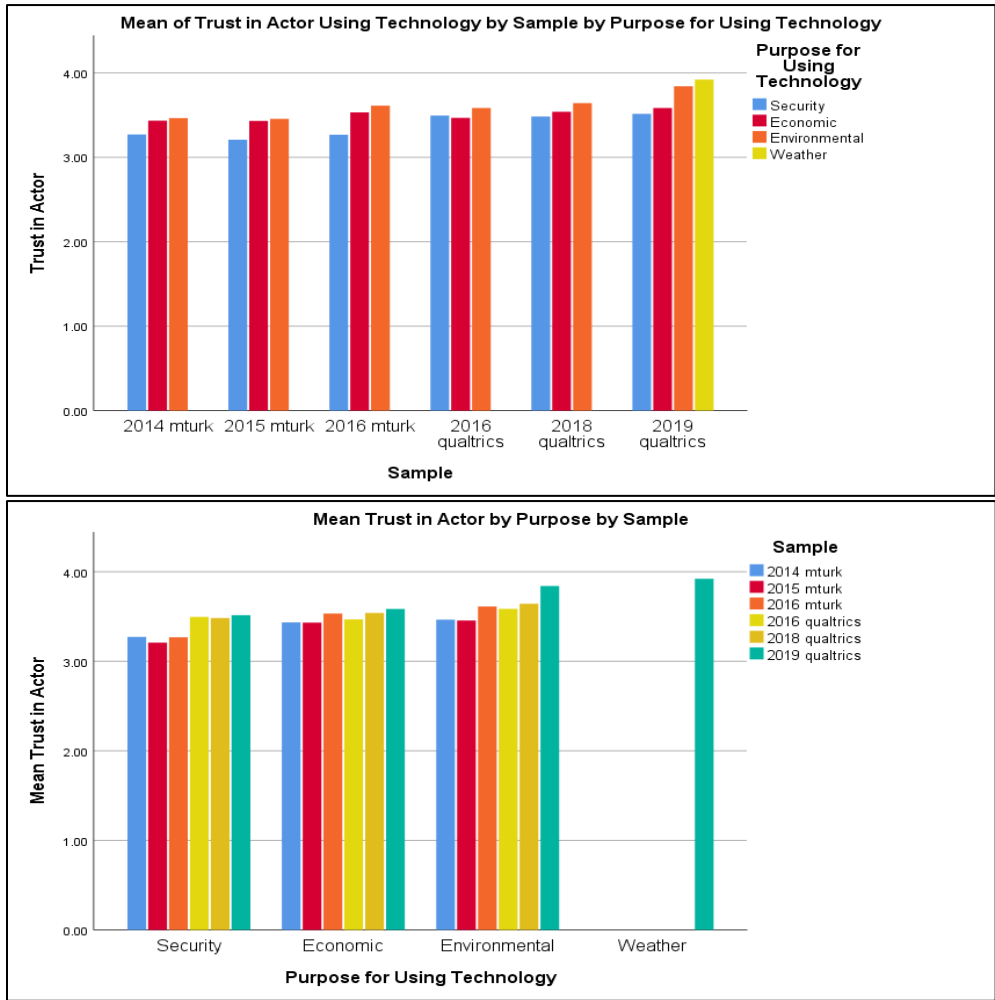
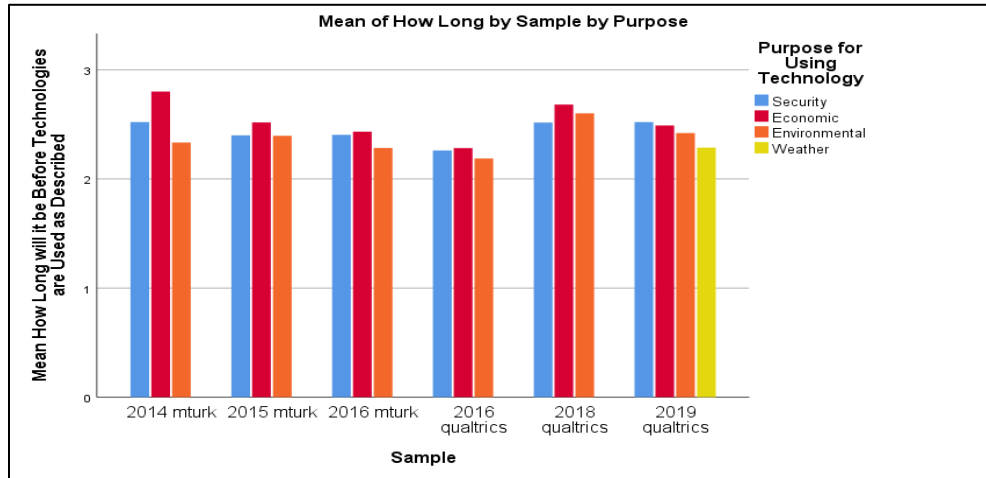


Figure 8. Effect of Purpose on Estimated Time (How Long) Before Technology

Would be Used as Described



Main effects of ACTOR using the technology. As shown in **Table 28**, actor had a very small main effect on support such that use by private business actors resulted in less support than use by government/public actors. This small effect was statistically or marginally significant in each sample except for 2015 (see **Figure 9**).

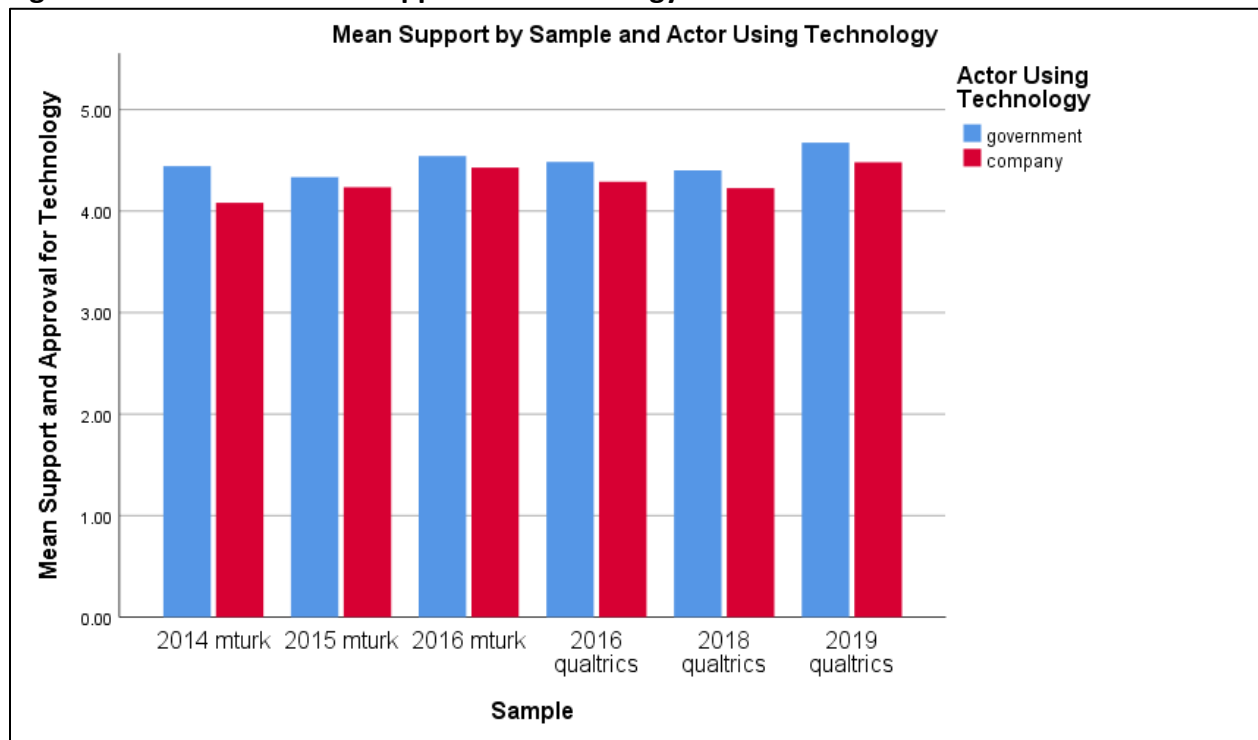
Table 28. Main Effects of Actor Using Technology on Primary Dependent Variables

Dependent Variable, Predictor set									
Individual predictors (if predictor set resulted in significant F-change)									
Support/Trust									
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Support, actor	.293	0.086	0.083	1.530	0.003***	21.68	1	7236	0.000
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
Actor (private)	-0.168	0.036	-0.052	-4.656***	0.000	-0.055	-0.055	-0.052	
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Trust actors, actor	.179	0.032	0.029	0.947	0.003***	26.05	1	7236	0.000
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
Actor (private)	0.114	0.022	0.059	5.104***	0.000	0.056	0.060	0.059	
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Trust reg., actor	.181	0.033	0.030	1.119	0.002***	14.58	1	6359	0.000
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
Actor (private)	0.107	0.028	0.047	3.819***	0.000	0.043	0.048	0.047	

	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Trust UATs, actor	0.136	0.018	0.015	0.772	0.000	0.496	1	6359	0.481
Awareness/Knowledge									
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Subj. know., actor	.292	0.085	0.082	0.918	0.000	1.416	1	6359	0.234
Obj. know., actor	.147	0.022	0.018	1.112	0.000	0.724	1	6359	0.395
How long, actor	.218	0.047	0.045	1.212	0.000	0.027	1	7236	0.870

Notes. + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$ significance (sig.) levels. B and SE are the unstandardized parameter estimates for the listed predictor variables predicting the dependent variable; Beta is the standardized estimate. Also presented are the simple (zero-order), partial and part correlations from the full regression equations. Parameter estimates computed in the context of a multiple regression models described in text. Each parameter estimate is relative to the reference category (in this case, Actor public/government).

Figure 9. Effect of Actor on Support for Technology



Actor was also significantly related to trust in the actor using technology and regulator regulating the technology. However, surprisingly, these relationships were in the opposite direction as for support, with trust being higher when the actor was a private business rather than a public governmental entity. The effect was again quite small (never accounting for more than

1% of the independent variance in actor trust, and not more than .5% of regulator trust). The effect of actor on actor trust was not significant in 2014 or 2015 (see **Figure 10**). The effect of actor on regulator trust was only significant in the 2016 MTurk sample and marginal in the 2018 and 2019 samples (see Figure 11). Nonetheless, the effects were in a consistent direction across all samples. Actor was not related to trust in the technologies themselves, either overall or in each sample tested individually.

Actor also was not significantly related to the awareness variables of subjective knowledge, objective knowledge, or estimates of “how long” before a technology might be used as described in the scenario.

Figure 10. Effect of Actor on Trust in Actor Using the Technology

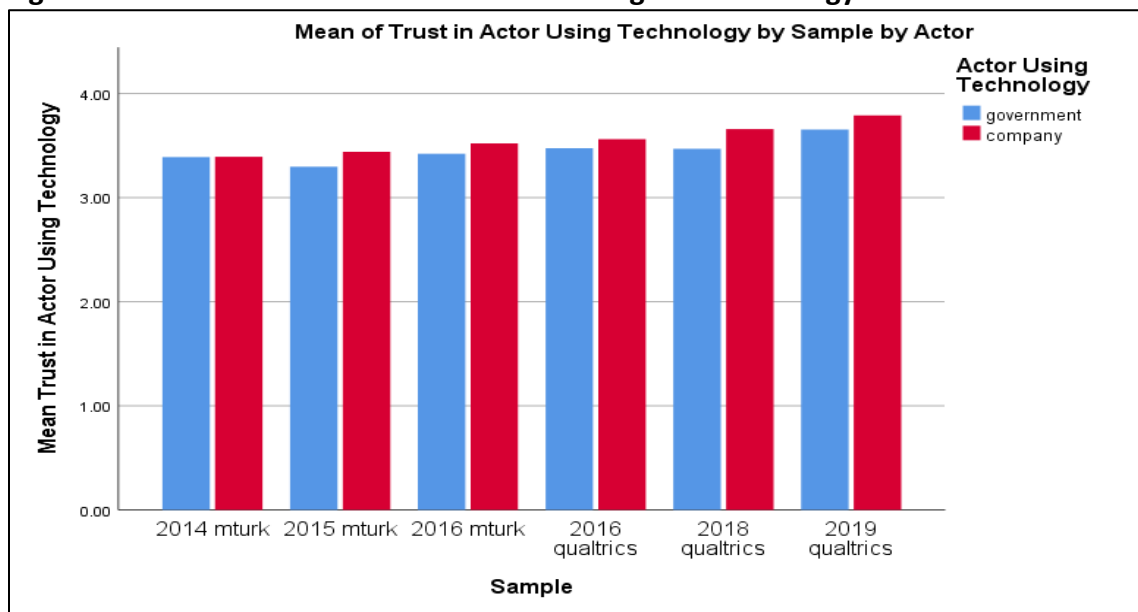
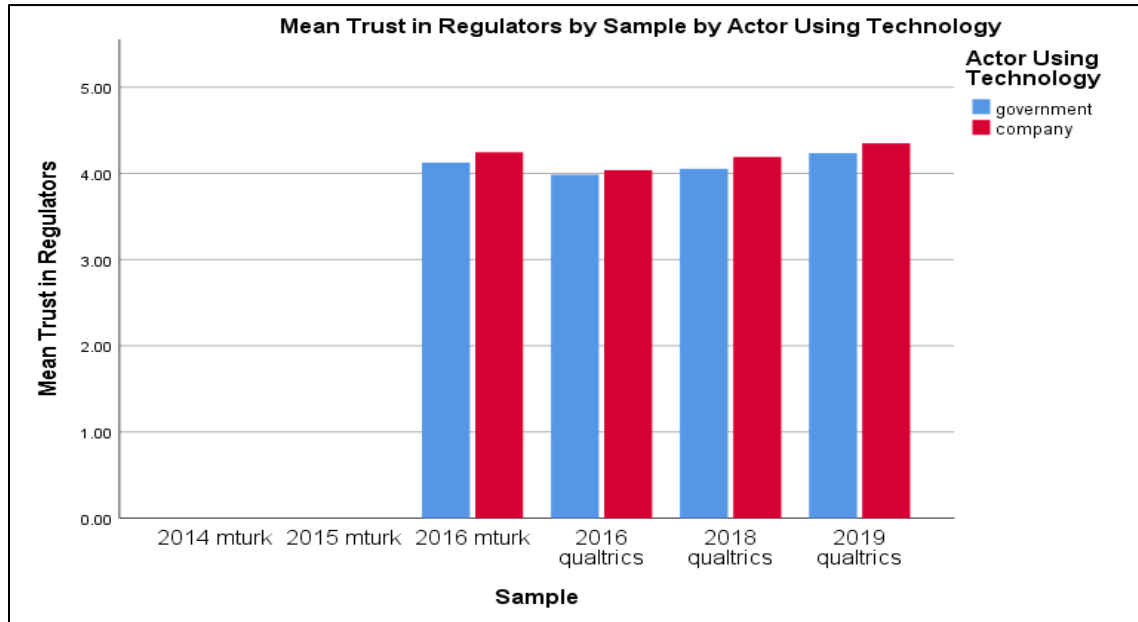


Figure 11. Effect of Actor on Trust in Regulators



Main effects of AUTONOMY of the technology. As shown in Table 29, the autonomy of the technology had a very slight effect on support, such that manual technologies (under full control) were less supported than those described as partially or fully autonomous. The pattern of this effect (where the manual portrayals were less supported) was fairly stable across samples but was so weak that it only achieved statistical significance in the 2016 MTurk sample (see Figure 12).

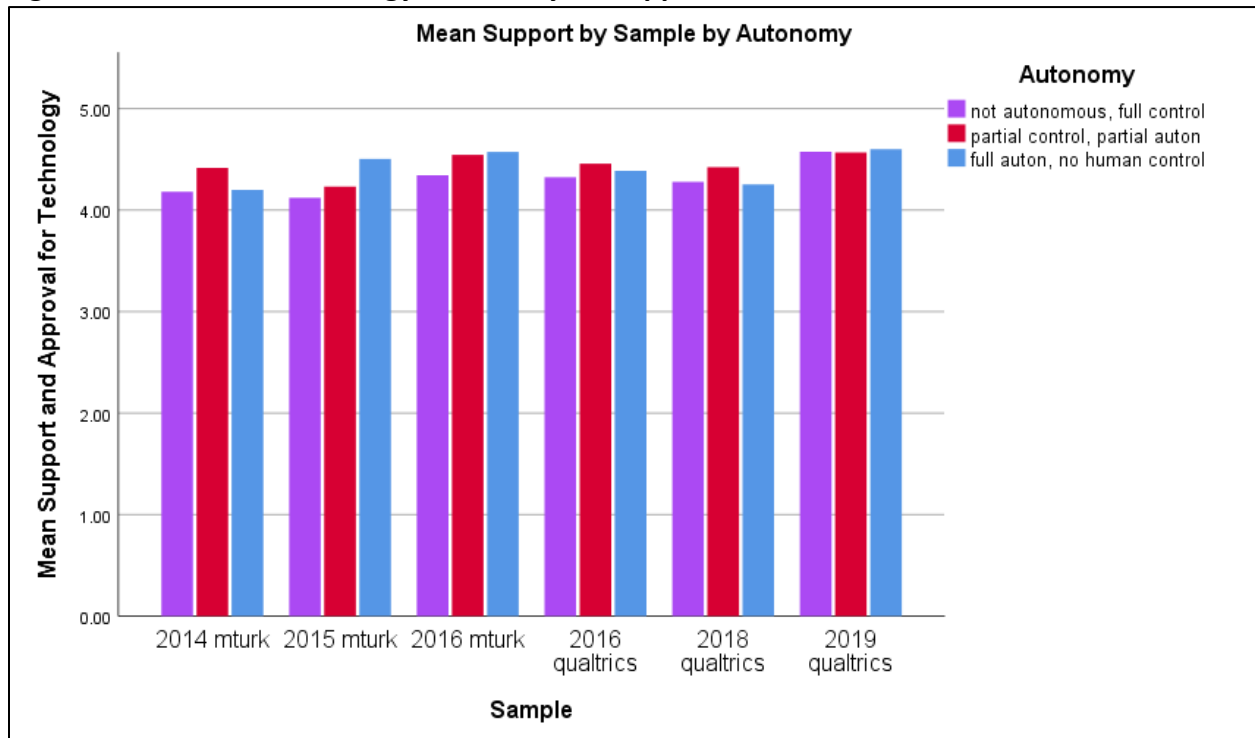
Table 29. Effects of Autonomy on Primary Dependent Variables

Dependent Variable, Predictor set									
Individual predictors (if predictor set resulted in significant F-change)									
Support/ Trust									
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Support, autonomy	.293	0.086	0.083	1.530	0.002**	6.153	2	7236	0.002
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Autonomous</i>	0.108	0.044	0.032	2.451*	0.014	0.009	0.029	0.028	
<i>Mixed</i>	0.150	0.044	0.044	3.400**	0.001	0.026	0.040	0.038	
	R	R ²	Adj. R ²	Std. Error	R ² Chg	F Chg	df1	df2	Sig. F Chg
Trust actors, autonomy	.179	0.032	0.029	0.947	0.001*	3.064	2	7236	0.047
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Autonomous</i>	0.067	0.027	0.033	2.449*	0.014	0.022	0.029	0.028	
<i>Mixed</i>	0.042	0.027	0.021	1.542	0.123	0.004	0.018	0.018	

	R	R²	Adj. R²	Std. Error	R² Chg	F Chg	df1	df2	Sig. F Chg
Trust reg., autonomy	.181	0.033	0.030	1.119	0.002**	6.606	2	6359	0.001
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Autonomous</i>	0.120	0.034	0.050	3.502***	0.000	0.031	0.044	0.043	
<i>Mixed</i>	0.089	0.034	0.037	2.596**	0.009	0.011	0.033	0.032	
	R	R²	Adj. R²	Std. Error	R² Chg	F Chg	df1	df2	Sig. F Chg
Trust UATs, autonomy	.136	0.018	0.015	0.772	0.000	1.158	2	6359	0.314
Awareness/Knowledge									
	R	R²	Adj. R²	Std. Error	R² Chg	F Chg	df1	df2	Sig. F Chg
Subj. know., autonomy	.292	0.085	0.082	0.918	0.000	0.020	2	6359	0.980
Obj. know., autonomy	.147	0.022	0.018	1.112	0.000	0.427	2	6359	0.653
How long, autonomy	.218	0.047	0.045	1.212	0.007***	24.920	2	7236	0.000
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Autonomous</i>	-0.238	0.035	-0.090	-6.807***	0.000	-0.055	-0.080	-0.078	
<i>Mixed</i>	-0.176	0.035	-0.067	-5.030***	0.000	-0.021	-0.059	-0.058	

Notes. + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$ significance (sig.) levels. B and SE are the unstandardized parameter estimates for the listed predictor variables predicting the dependent variable; Beta is the standardized estimate. Also presented are the simple (zero-order), partial and part correlations from the full regression equations. Parameter estimates computed in the context of a multiple regression models described in text. Each parameter estimate is relative to the reference category (in this case, entirely manual control).

Figure 12. Effect of Technology Autonomy on Support



Autonomy also had a slight impact on trust in actors and regulators, with fully autonomous technologies associated with higher rated trust of actors and regulators than fully manual ones. The autonomy effect only accounted for a fraction of a percent of variance in trust in actor or regulator overall. When the effect of autonomy was tested in each sample individually it was found to be significant for predicting trust in actors only in the 2014 and 2016 MTurk samples. Furthermore, the pattern for the 2014 sample was different than the overall pattern, with the mixed (partial autonomy) condition resulting in the most trust in actor (see **Figure 13**). When the effect of autonomy on trust in regulators was tested in each sample individually it was found to be significant only in the 2018 sample. The pattern of fully manual technologies being associated with the least trust in regulators was consistent across samples (see **Figure 14**). Interestingly and somewhat counterintuitively, the autonomy of the UATs did not impact ratings of trust in the UATs themselves (see **Table 29**).

Figure 13. Effect of Autonomy on Trust in Actor

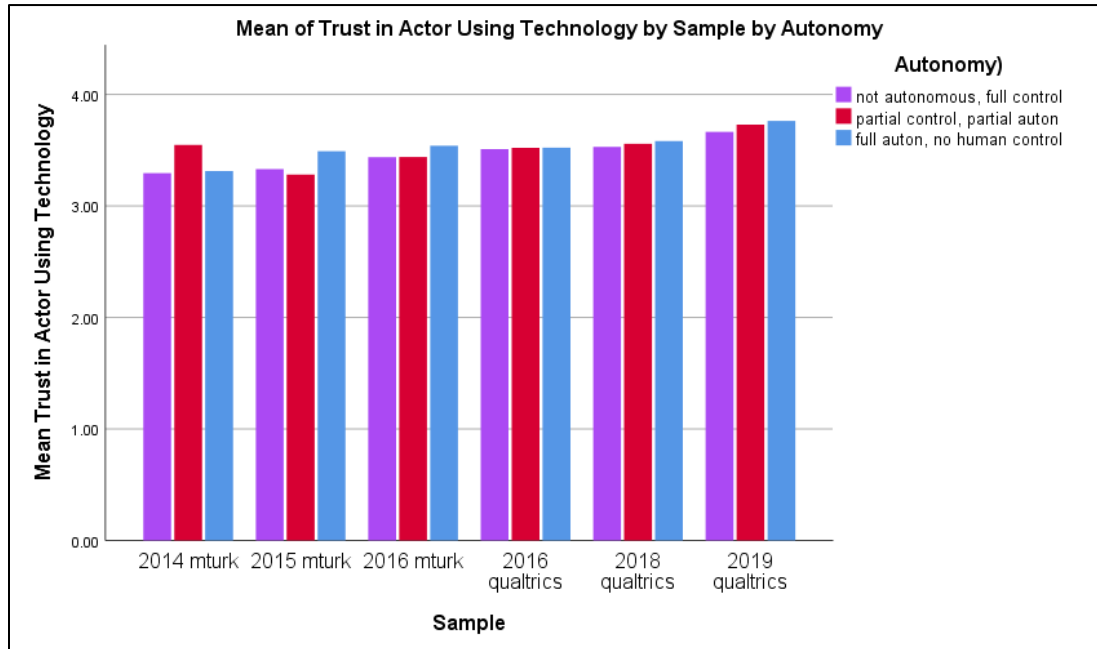
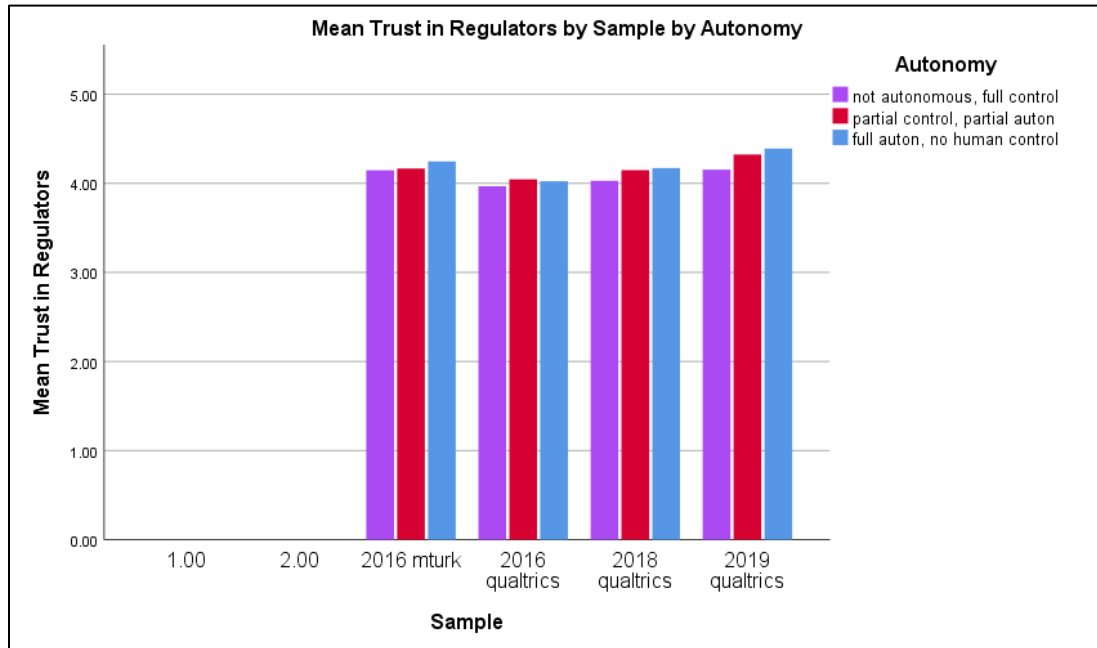


Figure 14. Effect of Autonomy on Trust in Regulators



Autonomy did not have a significant association with ratings of subjective knowledge or measured objective knowledge. However it did appear related to ratings of “how long” before the technology would be used as described in the scenario. Specifically, manually operated technologies were given ratings indicating a longer time frame for use than were the technologies

when described as autonomous (see **Figure 15**). When the effect was tested in each individual sample, it was statistically significant in both 2016 samples and the 2018 sample. The autonomy effect accounted for 2.8% of independent variance in “how long” in the 2016 MTurk sample, but much less in the other samples (.2-1.3%).

Given the counterintuitive effect that manually controlled technologies would be rated as taking longer to develop than fully autonomous ones, we examined the frequencies distributions for the “how long” variable overall and for each of the autonomy conditions. It may have been, for example, that people rated solely manual technologies as “never” to be used that way, due to a belief that technologies had advanced beyond manual control and therefore it would not make sense to use them that way ever in the future. However, as shown in **Figure 16**, there did not seem to be a larger frequency of endorsement of “NEVER” in the manual condition. Instead, the middle three categories (5 – 50 years) appeared to be endorsed more often.

Figure 15. Effect of Autonomy on Ratings of "How Long" Before a Technology Would be Used as Described in the Scenario

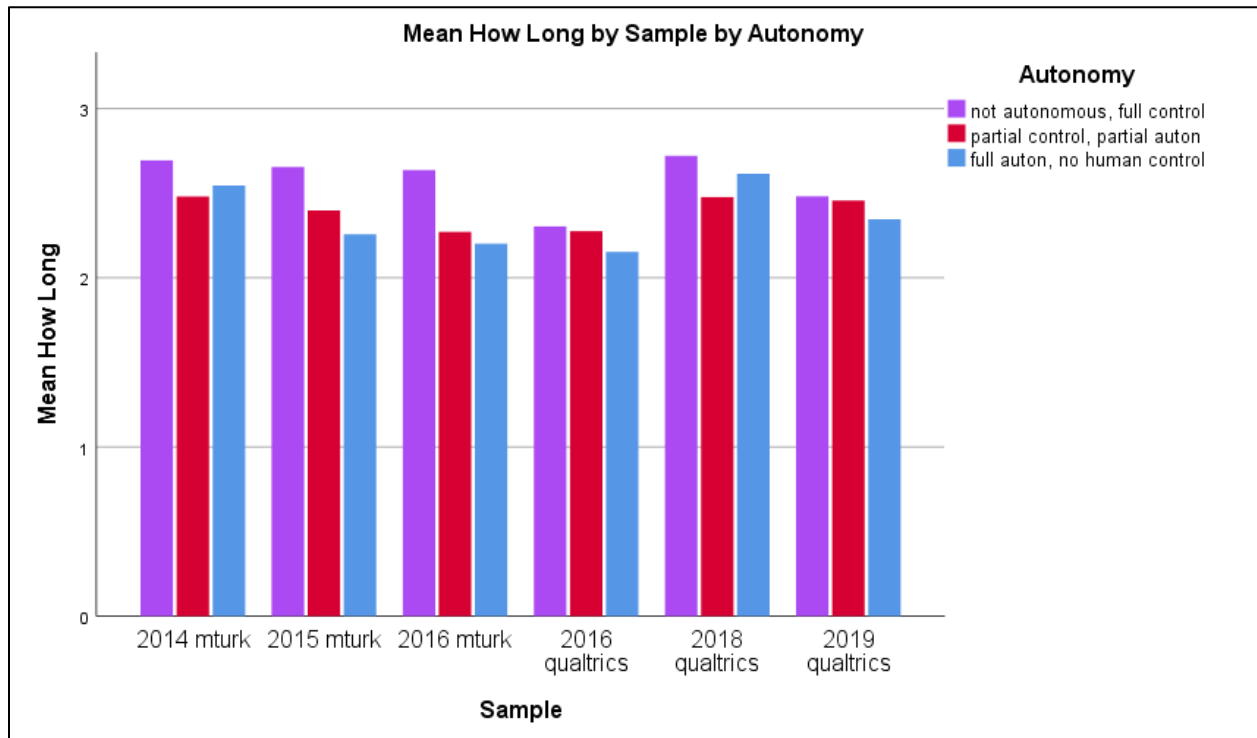
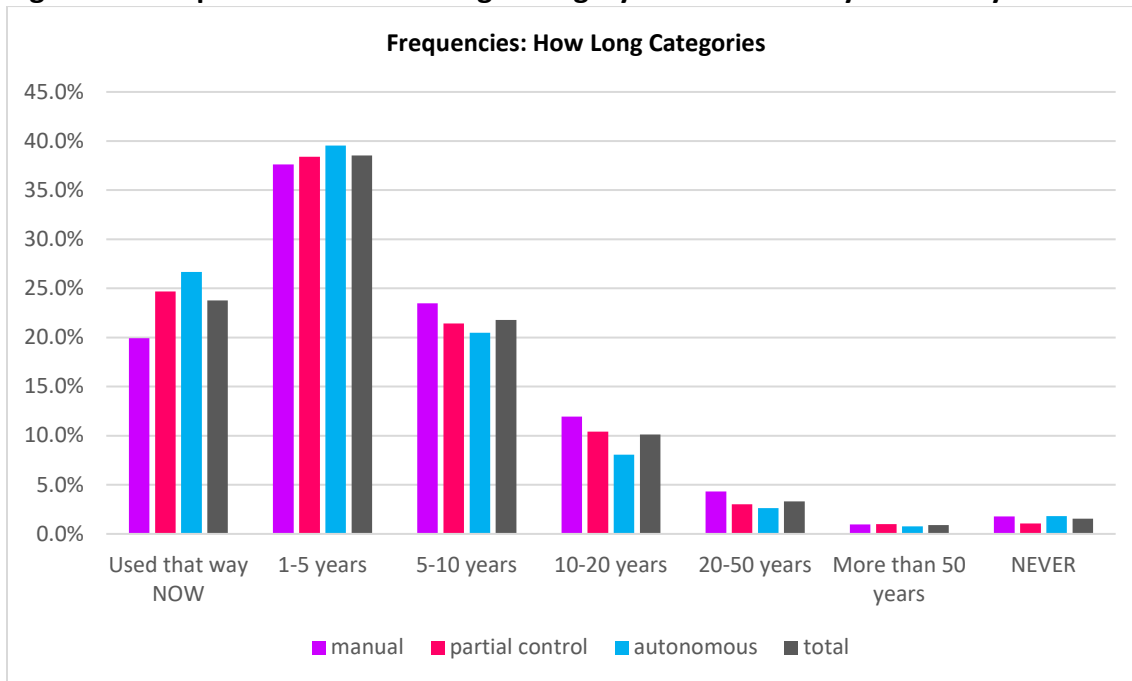


Figure 16. Frequencies of "How Long" Category Endorsement by Autonomy Condition



Main effects of FRAMING of use of the technology. The fifth and final factor varied in our survey experiment was framing of the purposes of the technologies. As shown in **Table 30**, framing had a small statistically significant effect (accounting for only .1% of the independent variance) upon each of the support and trust variables, such that support and trust was slightly higher in the prevention-focused condition. This pattern of effects was almost entirely in the same direction in each sample (see Figure 17, Figure 18, Figure 19, Figure 20).⁶ However, when samples were tested individually, the effects were rarely statistically significant in the individual samples. When predicting support, the effect was only significant in 2014; when predicting actor and regulator trust, the effect was not significant in any sample; and when predicting UAT trust the effect was only significant in the 2016 MTurk and 2018 samples.

Framing did not have any overall effects on the awareness variables (subjective and objective knowledge, or estimates of how long before the technologies would be used as described in the scenarios.

⁶ The only exception was for trust in actor, 2015 MTurk sample, as shown in Figure 18.

Table 30. Effects of Framing on Primary Dependent Variables

Dependent Variable, Predictor set									
<i>Individual predictors (if predictor set resulted in significant F-change)</i>									
Support/Trust									
	R	R²	Adj. R²	Std. Error	R² Chg	F Chg	df1	df2	Sig. F Chg
Support, framing	.293	0.086	0.083	1.530	0.001**	8.860	1	7236	0.003
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Promotion frame</i>	-0.107	0.036	-0.033	-2.977**	0.003	-0.036	-0.035	-0.033	
	R	R²	Adj. R²	Std. Error	R² Chg	F Chg	df1	df2	Sig. F Chg
Trust actors, framing	.179	0.032	0.029	0.947	0.001*	5.078	1	7236	0.024
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Promotion frame</i>	-0.050	0.022	-0.026	-2.254*	0.024	-0.027	-0.026	-0.026	
	R	R²	Adj. R²	Std. Error	R² Chg	F Chg	df1	df2	Sig. F Chg
Trust reg., framing	.181	0.033	0.030	1.119	0.001**	7.259	1	6359	0.007
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Promotion frame</i>	-0.076	0.028	-0.033	-2.694**	0.007	-0.034	-0.034	-0.033	
	R	R²	Adj. R²	Std. Error	R² Chg	F Chg	df1	df2	Sig. F Chg
Trust UATs, framing	.136	0.018	0.015	0.772	0.001**	9.523	1	6359	0.002
	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>Zero-order</i>	<i>Partial</i>	<i>Part</i>	
<i>Promotion frame</i>	-0.060	0.019	-0.038	-3.086**	0.002	-0.039	-0.039	-0.038	
Awareness/Knowledge									
	R	R²	Adj. R²	Std. Error	R² Chg	F Chg	df1	df2	Sig. F Chg
Subj. know., framing	.292	0.085	0.082	0.918	0.000	0.167	1	6359	0.683
Obj. know., framing	.147	0.022	0.018	1.112	0.000	0.013	1	6359	0.908
How long, framing	.218	0.047	0.045	1.212	0.000	2.558	1	7236	0.110

Notes. + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$ significance (sig.) levels. B and SE are the unstandardized parameter estimates for the listed predictor variables predicting the dependent variable; Beta is the standardized estimate. Also presented are the simple (zero-order), partial and part correlations from the full regression equations. Parameter estimates computed in the context of a multiple regression models described in text. Each parameter estimate is relative to the reference category (in this case, prevention framing).

Figure 17. Effect of Framing (Goal Focus) on Support

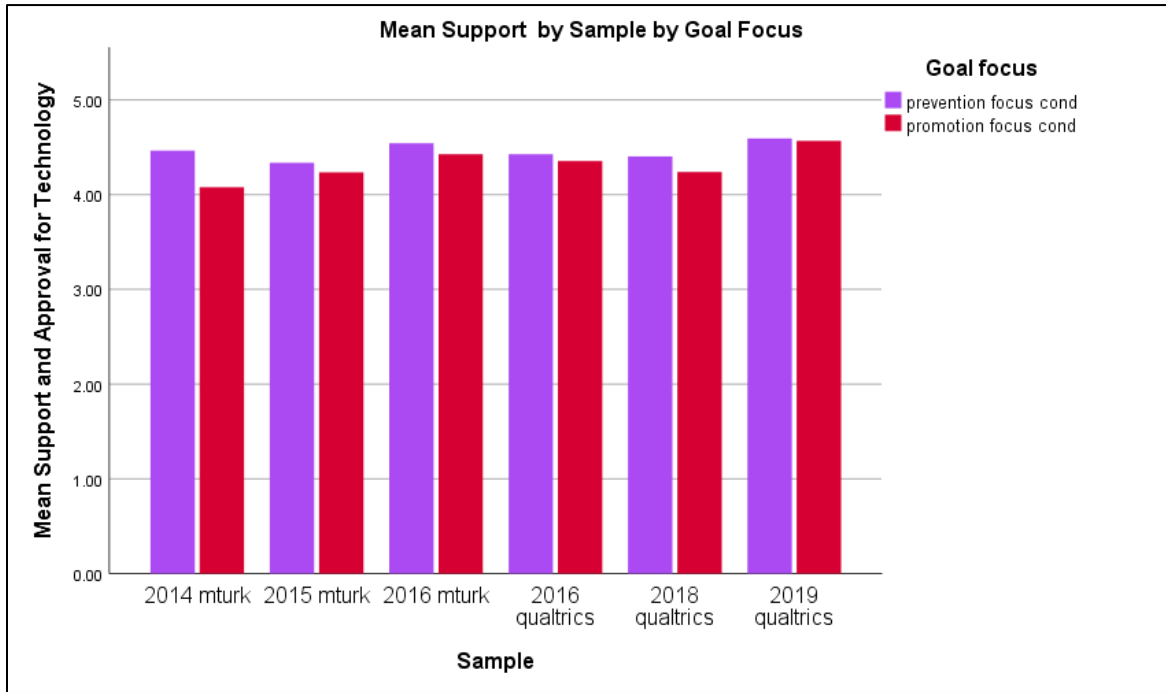


Figure 18. Effect of Framing (Goal Focus) on Trust in Actor

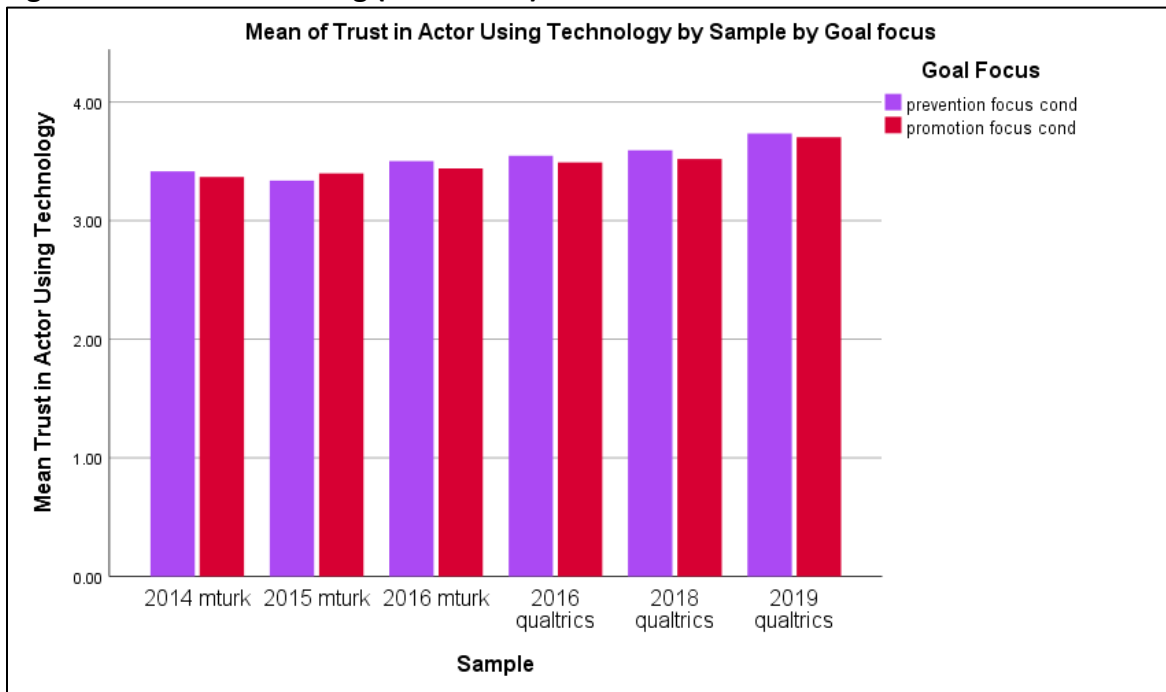


Figure 19. Effect of Framing (Goal Focus) on Trust in UATs

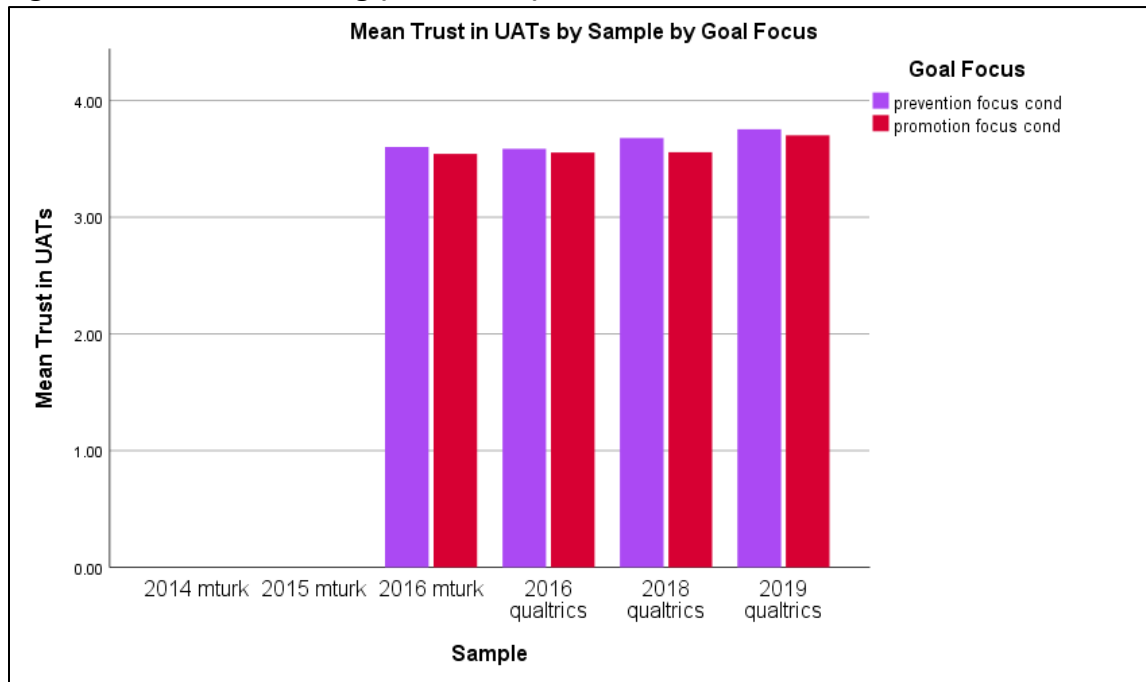
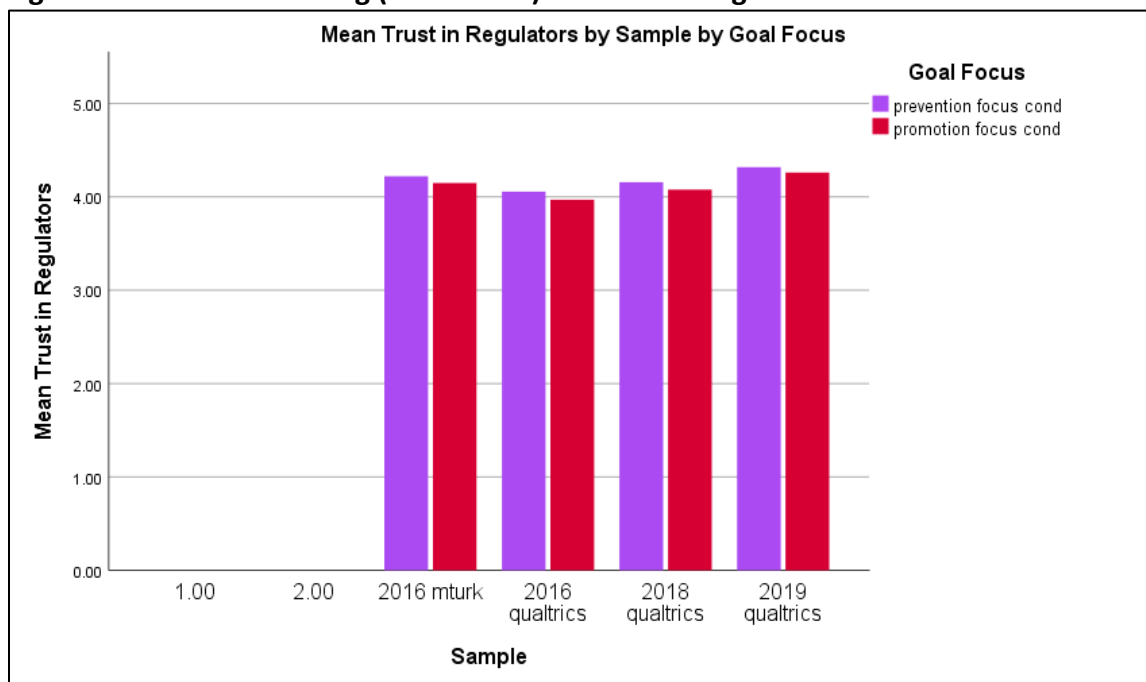


Figure 20. Effect of Framing (Goal Focus) on Trust in Regulators



Impacts of Trustworthiness Perceptions on Support for the Technologies

A primary hypothesis of our study was that trust in various entities (actors using the technologies, and later also trust in regulators and the technologies themselves) would impact

support for the technologies, and possibly mediate certain main effects of our experimental manipulations. For example, the greater support for the technologies observed when they were used by government rather than private companies, we initially supposed might be explained by relatively higher trust in government than private companies. This did not turn out to be likely, given that trust in actors was actually higher for the private companies than for government. Nonetheless, we next examined the impact of our trust variables upon support by entering them into our hierarchical regression procedures. Specifically, step 1 of our hierarchical regression entered all the demographics and control variables (including year of survey), step 2 entered all of the main effects of our experimental variables, and step 3 entered the trust variables (trust in actors, regulators, and UATs). Because we used listwise deletion of data, and included the trust in UATs and regulators, these analyses only used data from 2016-2019 and omitted the 2014-15 data.

As shown in Table 31, step 1 (control variables) accounted for a very small but significant amount of variance in support for technologies (less than 1%), with gender being the largest contributor of independent variance (.5%, from the part-square correlation).

Step 2 (experimental main effects) resulted in an increase in variance accounted for of about 7%. The largest predictors, as noted earlier, were the variables representing purpose. The security purpose resulted in the greatest decrease of support relative to the comparison group (weather purpose). Use for economic purposes also resulted in significantly less support than weather purposes, but use for environmental purposes did not.

Step 3, the addition of the trust variables, accounted for an additional 32% of the variance. Much of the variance accounted for was shared among the trust variables, but each trust variable also did account for a significant amount of variance on its own. Perceptions of the trustworthiness of the technologies themselves accounted for the greatest amount of independent variance, about 4.6%. Trustworthiness of the actors using the technologies accounted for 1.25% and trust in the regulators creating policies for the technology use accounted for less than 1% of independent variance. It is also interesting to note that addition of the trust variables to the model appeared to reduce the variance accounted for by the experimentally varied purpose, autonomy, and goal focus conditions. This suggests it may be beneficial to explore whether these experimentally induced effects are partially mediated by changes trust. The effects of terminology and actor were not reduced by adding the trust variables to the model.

Table 31. Hierarchical Regression Results Predicting Support for Technologies (2016-2019)

	Step 1				Step 2				Step 3			
	B	Std. Error	Beta	Part-sqr	B	Std. Error	Beta	Part-sqr	B	Std. Error	Beta	Part-sqr
(Constant)	-90.49	36.17			31.01	37.38			117.56	30.22		
Source	-0.13	0.05	-0.04 *	0.10%	-0.12	0.05	-0.03 *	0.08%	-0.09	0.04	-0.03 *	0.04%
Gender	-0.23	0.04	-0.07 ***	0.50%	-0.23	0.04	-0.07 ***	0.52%	-0.17	0.03	-0.05 ***	0.27%
ideology	0.00	0.01	0.00	0.00%	0.00	0.01	0.00	0.00%	0.01	0.01	0.01	0.00%
Age	0.00	0.00	0.01	0.00%	0.00	0.00	0.01	0.01%	0.00	0.00	0.00	0.00%
White	-0.09	0.07	-0.02	0.03%	-0.08	0.06	-0.02	0.02%	-0.01	0.05	0.00	0.00%
Black	-0.07	0.08	-0.01	0.01%	-0.08	0.08	-0.02	0.02%	-0.05	0.06	-0.01	0.01%
Native HPI	-0.42	0.34	-0.02	0.02%	-0.48	0.33	-0.02	0.03%	-0.65	0.26	-0.02 *	0.06%
Asian	0.16	0.09	0.03	0.04%	0.17	0.09	0.03	0.05%	0.13	0.07	0.02	0.03%
AI or AN	0.04	0.16	0.00	0.00%	0.04	0.15	0.00	0.00%	0.08	0.12	0.01	0.00%
Other	-0.55	0.23	-0.03 *	0.09%	-0.47	0.22	-0.03 *	0.07%	-0.22	0.18	-0.01	0.02%
Year	0.05	0.02	0.04 **	0.11%	-0.01	0.02	-0.01	0.01%	-0.06	0.01	-0.04 ***	0.13%
Actor					-0.16	0.04	-0.05 ***	0.24%	-0.22	0.03	-0.07 ***	0.48%
T-UAS					-0.16	0.05	-0.04 **	0.13%	-0.16	0.04	-0.04 ***	0.13%
T-UAV					-0.17	0.05	-0.05 **	0.15%	-0.19	0.04	-0.05 ***	0.18%
T-AR					-0.10	0.05	-0.03	0.05%	-0.11	0.04	-0.03 **	0.07%
P-Security					-1.27	0.10	-0.37 ***	2.51%	-0.86	0.08	-0.25 ***	1.14%
P-Environmental					-0.35	0.10	-0.10 ***	0.19%	-0.13	0.08	-0.04 ***	0.02%
P-Economic					-0.89	0.10	-0.26 ***	1.24%	-0.56	0.08	-0.16 ***	0.49%
A-Autonomous					0.10	0.05	0.03 *	0.06%	0.03	0.04	0.01	0.01%
A-Mixed					0.14	0.05	0.04 **	0.13%	0.10	0.04	0.03 *	0.06%
Goal Focus					-0.09	0.04	-0.03 *	0.07%	-0.02	0.03	-0.01	0.00%
Zscore: Trust in UATs									0.53	0.02	0.33 ***	4.59%
Zscore: Trust in Actor									0.27	0.02	0.17 ***	1.25%
Zscore: Trust in Regulators									0.21	0.03	0.13 ***	0.68%
Model Statistics	Df1	R²	R²-chg		Df1	R²	R²-chg		Df1	R²	R²-chg	
	11	.009 ***	.009 ***		21	.083 ***	.073 ***		24	.402 ***	.320 ***	
	Df2	F	F-chg		Df2	F	F-chg		Df2	F	F-chg	
	6369	5.15	5.15 ***		6359	27.29	50.78 ***		6356	178.35	1133.7 ***	

Notes. Source of sample 0 = MTurk, 1 = Qualtrics; Gender 0=male 1=female; Ideology is a scale across overall economic and social, high = conservative; HPI = Hawaiian or Pacific Islander; AI or AN = American Indian or Alaskan Native; Actor 0=Government, 1 = Company; T- indicates dummy codes for terminology; P- indicates dummy codes for purpose; A- indicates dummy codes for autonomy. Red text identifies parameters (or sets of parameters) that appeared to change in value when the variables in the subsequent step(s) were entered into the model.

Discussion

The surveys reported here were administered to both non-representative national samples (MTurk) and representative national samples (Qualtrics) across approximately five years (2014 to 2019). Comparisons in 2016 found that the samples did differ in demographics, but differed on relatively few of the perception variables. Consistent with that finding, analyses revealed relatively few effects of demographics. There was greatest evidence that men were more supportive of the technologies than women; however, the gender effect appeared to vary somewhat by terminology (strongest when the technologies were referred to as UASs or UAVs). The finding of gender effects is consistent with other research finding men are more supportive of certain new technologies (e.g., robots) than women, and with a finding that men have been more supportive of drones for civil uses than were women (Eißfeldt & Biella, 2018).

Examination of open-ended responses to questions about the positive and negative factors (hopes and concerns) associated with UATs indicated concerns about privacy, safety, technical, and usage concerns, and hopes for improving certain services and increasing safety were most prominent. The full list of concerns and hopes generated as a part of this study may be useful for creating closed-ended attitudinal measures of perceptions of UATs. The types of hopes and concerns listed varied according to both demographics and the terminology used to refer to the UAT. This finding contrasts with the comparably few and small effects of terms and demographics found when predicting overall support for the UATs, and could suggest that differences in views concerning UAT uses exist at a more fine-grained topical level that still translates into similar broader levels of overall support.

The findings pertaining to changes over time require additional study and explanation. There were little to no effects of time on support or resistance to the use of the technologies, with the exception of slight more support over time for use of the technologies for security purposes (the least-favored purpose in our studies). While year of the study positively predicted the percentage of persons indicating they had heard of the technologies (at least when they were referred to as drones or as aerial robots), it did not predict reports of subjective knowledge, and negatively predicted correct answers to certain factual questions about the technologies and their regulation. In addition, the time horizon for use of the technologies under various conditions was longer in later years than in earlier years, even after controlling for the mode of the survey and demographics. This seems counterintuitive, but could reflect increased familiarity and awareness of the barriers to UAT use among the public. However, as discussed next, we also found that the public is the most familiar with the technology when referred to as drones, and there was an association between the use of the term “drone” and a shorter time frame for use. This seems counter to the suggestion that familiarity/awareness of barriers is creating the longer time frame estimates.

The effects of terminology were strongest when it came to familiarity of the technology. As might be expected, the term “drone” was most associated with respondents indicating they had heard of the technology. In addition, terminology impacted both subjective and objective knowledge, with the term “drone” leading to the highest subjective and objective knowledge scores. Drone was also associated with the shortest time frame estimates for eventual use of the technologies under the various scenario conditions. Each of these findings seems consistent with the idea that the public finds the technologies most familiar if referred to as drones. Given the lack of association between terminology and support for the technologies, it may make more sense to refer to the technologies by the term most familiar to the public (“drones”).

The finding that people were less favorable toward commercial uses than environmental purposes is consistent with other surveys (Lowy & Agiesta, 2014). Also, the U.S. public has generally been supportive of use of UATs for national security purposes (Pew Research Center, 2015), but routine policing uses have garnered much less support (Murray, 2012, 2013), consistent with the findings of less support for security purposes in the present surveys. The present study expands findings from prior studies by additionally finding that purposes predict trust, especially in the actors using the technologies and the regulators regulating the technologies. Purpose was also related to time horizon for use, such that the most supported purposes are estimated as being the purposes with the shortest estimated time frames (i.e., for when the technologies might actually be used as depicted in the scenarios). Future analyses may explore the extent to which estimated time frame for use is actually also an indicator of how positive the public feels about the technology use.

Additional research is also needed to clarify the findings relating to the effects of different actors using the technologies. In our U.S. samples, there was a small effect such that use of the UATs was more supported when used by the government rather than by private companies. Meanwhile, trust in actors and regulators was rated higher when the UATs were used by private companies. Given the strong relationship between trust and support, this finding seems puzzling. It may be useful to examine different components of trust (e.g., competence vs. benevolence) in order to better understand this apparent discrepancy.

Examination of the impacts of various levels and types of autonomy of the technologies suggested that the public is accepting of the technologies having some autonomy. The public apparently does not feel that complete manual control of the technologies is beneficial, given the slight negative effect that completely manual technologies had on support and trust. Interestingly, completely manual UATs were related to reduced trust in the actors using the technologies and in the regulators, but not to reduced trust in the UATs themselves. It may be useful to look at the individual items pertaining to trust in UATs to see if certain items were affected by complete manual control, while others were not affected. For example, complete manual control might not be viewed as likely to result in greater malfunctions, but may relate to more negative effects overall. If the scale included some items that were affected by perceptions

of manual control and others that were not affected (or affected in an opposite direction), it could have resulted in an overall null effect.

Finally, examination of the effects of trustworthiness perceptions on support of the use of UATs found a very large effect of the trustworthiness perception variables on support. Because our data were cross-sectional, an alternative possibility is that support for the technologies impacted trustworthiness perceptions. Of the three types of trust variables, reported perceptions of the trustworthiness of the technologies themselves had the strongest relationship with support for the technologies, accounting for more independent variance than trust in the actors using the technologies or those regulating the technologies. Nonetheless, all three types of trustworthiness variables did account for independent variance, suggesting the importance of understanding the combined impacts of multiple targets of trust when new technologies are being introduced into society.

Limitations

The present study is, of course, not without limitations. The MTurk samples were nationwide but not representative of the U.S. population. The Qualtrics samples were nationwide and representative but were panel respondents and not randomly sampled from the entire population. It is possible that our respondents were not fully representative in their attitudes towards the UATs, because it could have been their attitudes that impacted their willingness to complete the survey. In addition, although efforts were made to ensure the survey responses were quality responses (e.g., through the use of speeding and attention checks), quality of responses in panel and volunteer samples can vary. It also should be noted that the surveys were not equally spaced over time and our measures of attitudes, although internally reliable, were constructed prior to obtaining the open-ended descriptions of hopes and concerns and therefore may not fully cover all important attitude dimensions.

Even with these limitations, however, the present data provide a unique examination of public attitudes toward UATs during a time period in which use is increasing but which is still prior to their widespread use. As such, the data may provide useful insights upon which future studies and analyses may build.

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Appendix A: Appendix of Survey Design and Surveys

This is an appendix to the *Public Opinions of Unmanned Aerial Technologies in 2014-2019: A Technical Report* published by the University of Nebraska Public Policy Center in 2020.

APPENDIX A.1 - SURVEY DESIGN IN 2014-15, AND IN *2016-18 AND IN **2019

*Measures added or changed in 2016-18 are denoted with a star.

**Measures and procedures added or changed in 2019 are denoted with two stars.

Note: in the following, variables are used to assign values to certain conditions and these variables are indicated by “ $\{var\}$ ” with the precise contents of the variables defined in Appendix A.2.

Public Perceptions of Aerial Technologies Survey

*Starting in 2016, demographics for age, gender and race appeared here instead of later in the survey (see later in survey for precise wording).

Note: Italicized text indicates variable names in the data set

As you complete this survey, please do not “google” the topics. We are interested in whatever comes to your mind first.

haveheard

Have you heard of $\{e://Field/plur\}$? [plur = drones, UAVs, aerial robots, UASs]¹

Yes (1)

No (2)

Unsure (3)

¹ See Appendix A.2 for all field values identified by $\{field\}$

****In 2019, the following items (exampletxt and descrbtxt) were not asked:**

Answer If Have you heard of $\{e://Field/plur\}$? Yes Is Selected Or Have you heard of $\{e://Field/plur\}$?
Unsure Is Selected

exampletxt

If you are able, please give an example or two of where and what have you heard about them.

describtxt

Briefly describe what you think $\{e://Field/art\}$ is.

Definition

We are interested in what people think and feel about $\{e://Field/plur\}$. Here is how we define $\{e://Field/plur\}$: " $\{e://Field/capart\}$ is an aircraft without a human pilot aboard. Its flight is controlled either autonomously by onboard computers or by the remote control of a pilot on the ground or in another vehicle."

****In 2019, the following items (concerntxt and hopestxt) were not asked:**

concerntxt

What are one or two concerns that come to mind when you think of $\{e://Field/plur\}$?

hopestxt

What are one or two hopes or benefits that come to mind when you think of $\{e://Field/plur\}$?

****In 2019, the following "genatt" items were asked instead of the above two open-ended ones:**

genatt_1 to genatt_10

Please indicate the extent to which you agree or disagree with the following statements.

In general, when I think about $\{e://Field/plur\}$...I tend to think...

*Note that the following items were administered/displayed in randomized order by the survey software.

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
These technologies are awesome. (1)							
These technologies are annoying. (2)							
These technologies are beneficial to society. (3)							
These technologies are dangerous. (4)							
These technologies are safe. (5)							
These technologies are unnecessary. (6)							
These technologies do more harm than good. (7)							
These technologies are more beneficial than they are harmful. (8)							
In the long run, these technologies will greatly benefit humankind. (9)							
In the end, humankind will regret having created these technologies. (10)							

Scenario

Imagine that... ²

For the next questions, imagine that $\{e://Field/pubpriv\}$ has established $\{e://Field/agency\}$ that is investigating the use of $\{e://Field/shortplur\}$ to $\{e://Field/todo\}$. For example, the $\{e://Field/pubprivshort\}$ is considering that, by investing in certain $\{e://Field/short\}$ developments, the $\{e://Field/shortplur\}$ might $\{e://Field/propretxt\}$. The $\{e://Field/shortplur\}$ they are using are $\{e://Field/autontxt\}$

****In 2019, the following “rdchk” (reading check) questions were asked prior to moving on in the survey:**

² See Appendix describing the experimental conditions that result in text being inserted into this paragraph.

Before going on, answer the questions below...

rdck_who

1. Who is using the $\{e://Field/shortplur\}$ in this scenario?

- The U.S. Government (1)
- A private U.S. company (2)

rdck_what

2. Are the $\{e://Field/shortplur\}$ autonomous or manually controlled?

- Manually controlled (1)
- Partially autonomous (2)
- Fully autonomous (3)

rdck_why

3. What are the $\{e://Field/shortplur\}$ used for in this scenario?

- Environmental purposes (Natural resources monitoring and exploration) (1)
- Security purposes (2)
- Economic growth (3)
- Weather and climate studies (4)

**In 2019, if participants got the “rdchk” (reading check) questions wrong, they were asked change their answers prior to moving on in the survey, and then were given a reminder of the correct answers before the howlong question:

Please use the back button and check and change your answer to [[Question 1](#), [Question 2](#), and/or [Question 3](#)]; your current answer is incorrect.

The correct answers were that [\\$\[e://Field/pubpriv\]](#) is using [\\$\[e://Field/autonshort\]](#) [\\$\[e://Field/shortplur\]](#) for [\\$\[e://Field/shorttodo\]](#).

Here is the scenario again in case you want to refer to it as you answer the next questions...

...[\\$\[e://Field/pubpriv\]](#) has established [\\$\[e://Field/agency\]](#) that is investigating the use of [\\$\[e://Field/shortplur\]](#) to [\\$\[e://Field/todo\]](#). For example, the [\\$\[e://Field/pubprivshort\]](#) is considering that, by investing in certain [\\$\[e://Field/short\]](#) developments, the [\\$\[e://Field/shortplur\]](#) might [\\$\[e://Field/propretxt\]](#). The [\\$\[e://Field/shortplur\]](#) they are using are [\\$\[e://Field/autontxt\]](#)

howlong question is then below.

howlong

In your opinion, how long will it be before [\\$\[e://Field/plur\]](#) are used as described above?

They are used that way NOW (1)

1-5 years (2)

5-10 years (3)

10-20 years (4)

20-50 years (5)

More than 50 years (6)

They will NEVER be used that way (7)

appr

To what extent do you approve of [\\$\[e://Field/pubprivplur\]](#) using [\\$\[e://Field/plur\]](#) for the purposes described above?

StronglyDisapprove (1)

Disapprove (2)

SlightlyDisapprove (3)

Neutral/No opinion (4)

Slightly Approve (5)

Approve (6)

Strongly Approve (7)

supres

To what extent would you support or resist $\{e://Field/pubprivposs\}$ use of $\{e://Field/plur\}$ for the purposes described above? For example, how willing would you be to vote to allow such uses or have public funds promote such uses?

Strongly Resist (1)

Resist (2)

Slightly Resist (3)

Neutral/Neither (4)

Slightly Support (5)

Support (6)

Strongly Support (7)

Trustuser_1 to TrustUser_X

Below, indicate your opinions about how $\{e://Field/pubprivplur\}$ would behave when using $\{e://Field/plur\}$ for the purposes described above: $\{e://Field/pubprivcap\}$ would...

*Note that the following items were administered/displayed in randomized order by the survey software.

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Usually (5)	Always (6)
--	-----------	------------	---------------	-----------	-------------	------------

Only use the $\{e://Field/sing\}$ to benefit the public at large (1)

Use the $\{e://Field/sing\}$ for their own selfish benefit (2)

Be competent in their use of $\{e://Field/plur\}$ (3)

Be incompetent in their attempts to use the $\{e://Field/plur\}$ (4)

Be honest with the public about anything they find or do using the $\{e://Field/plur\}$ (5)

Be dishonest about anything they find or do using the $\{e://Field/plur\}$ (6)

Be transparent (open) about how, when, and why they are using the $\{e://Field/plur\}$ (7)

Hide information about how, when and why they are using the $\{e://Field/plur\}$ (8)

Use the $\{e://Field/plur\}$ to achieve values important to you (9)

Use $\{e://Field/plur\}$ to support values that you disagree with (10)

***In 2016, the following response items were added:**

Use the $\{e://Field/plur\}$ in ways that are appropriate to each situation (11)

This is an attention check: Please choose "Often" as your response to this item (12)

***The following two sections measuring trust in regulators and trust in UATs were added beginning with the 2016 survey.**

trustReg_1 to _13

Recall you are imagining that...

.. $\{e://Field/pubpriv\}$ has established $\{e://Field/agency\}$ that is investigating the use of $\{e://Field/shortplur\}$ to $\{e://Field/todo\}$. For example, the $\{e://Field/pubprivshort\}$ is considering that, by investing in certain $\{e://Field/short\}$ developments, the $\{e://Field/shortplur\}$ might $\{e://Field/propretxt\}$. The $\{e://Field/shortplur\}$ they are using are $\{e://Field/autontxt\}$.

Indicate the extent to which you agree wit the following statements as they relate to the likely REGULATORS of the $\{e://Field/plur\}$ for the specific purposes described. What do you think? How well do the following statements describe those who regulate the $\{e://Field/plur\}$ for the described purposes...

***Note that the following items were administered/displayed in randomized order by the survey software.**

	Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)
--	-----------------------	--------------	-----------------------	-------------	--------------------	-----------	--------------------

They care about the people they affect (1)

- They are incompetent (2)
- They are honest (3)
- They share your important values (4)
- They would share information openly and quickly when asked (5)
- They are legitimate authorities (6)
- They lack concern for those they affect (7)
- They are highly competent (8)
- In general, they are dishonest (9)
- They do not support your values (10)
- They are secretive (11)
- They have no right to tell people what to do (12)
- They have the resources do to their job (13)

trustUAT_1 to _14

Indicate the extent to which you think the following would happen, as related to the \$e://Field/plur that are used for the specific purposes described. What do you think? When used for the described purposes, how often would the \$e://Field/plur...

*Note that the following items were administered/displayed in randomized order by the survey software.

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Usually (5)	Always (6)
--	-----------	------------	---------------	-----------	-------------	------------

- Malfunction (1)
- Function reliably as expected (2)
- Result in injuries to people (3)
- Increase people's safety on the ground (4)
- Result in destruction of property (5)

- Result in protection of people’s property (6)
- Threaten people’s privacy (7)
- Achieve their intended purposes (8)
- Fail to achieve their intended purposes (9)
- Result in unintended negative effects (10)
- Result in unintended positive effects (11)
- Increase pilot safety (12)
- Protect people’s privacy (13)
- Increase the safety of other people in the air (i.e., in manned aircrafts) (14)

comm_mid

If you have and other comments about the use of $\{e://Field/plur\}$ for this purpose, or about those who might use, design, or regulate the $\{e://Field/plur\}$, please type them here.

Demographics

You are almost done! Please complete the following questions about you.

Atts_1 to atts_8

To what extent do you agree with the following?

**Note that the following items were administered/displayed in randomized order by the survey software.*

	Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)
--	-----------------------	--------------	-----------------------	-------------	--------------------	-----------	--------------------

I focus on opportunities that will enhance my life (1)

I am primarily motivated by seeking potential successes (2)

I focus on ensuring that I will avoid potential mishaps or negative events (3)

I am primarily motivated by avoiding failure. (4)

I believe protection of our environmental resources should be the nation's top priority. (5)

I believe U.S. national security should be the nation's top priority. (6)

I believe that a strong U.S. economy should be the nation's top priority. (7)

**Beginning in 2016, the following item was added:*

This is an attention check: Please choose "Disagree" for this item. (8)

***In 2019, the following items were added, values were underlined, and values items beginning with "I believe" were administered separately from the motivation questions.*

I believe addressing climate change should be the nation's top priority. (9)

I believe advancing science should be the nation's top priority. (10)

**Beginning in 2016, the following four items appeared at the beginning of the survey instead of at the end of the survey.*

age

What is your age?

gender

What is your gender?

Male (1)

Female (2)

Race_1 to race_5

What is your race/ethnicity? (check all that apply)

White (1)

Black or African American (2)

Native Hawaiian or other Pacific Islander (3)

Asian (4)

American Indian or Alaska Native (5)

*Spanish, Hispanic, or Latino/a

*Other (please specify): _____

*These 2 options starred above appeared beginning with the 2016 survey

*The yes/no Hispanic question only appeared in the 2014-15 surveys; it was made part of the check-all-that-apply beginning with the 2016 survey.

hispanic

Are you Spanish, Hispanic, or Latino?

Yes (1)

No (2)

polparty

In politics today do you consider yourself a Republican, Democrat, or Independent/other?

Strong Democrat (1)

Democrat (2)

Weak and leaning Democrat (3)

Independent/Other (4)

Weak and leaning Republican (5)

Republican (6)

Strong Republican (7)

Ideology_ov, _ec, and _so

Ideologically, which of the following best describes you?

	Strongly Liberal (1)	Moderately Liberal (2)	Weakly Liberal (3)	Centrist / Middle of the Road (4)	Weakly Conservative (5)	Moderately Conservative (6)	Strongly Conservative (7)
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Overall

When it comes to ECONOMIC issues

When it comes to SOCIAL issues

**The remaining items (subjknow and knw items) were added beginning with the 2016 survey.*

subjknow_1 to _5

To what extent do you feel knowledgeable about the following?

**Note that the following items were administered/displayed in randomized order by the survey software.*

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Usually (5)
--	-----------	------------	---------------	-----------	-------------

The regulations surrounding the use of $\{e://Field/plur\}$ for commercial or private use (1)

How $\{e://Field/plur\}$ are currently used by the government (2)

How $\{e://Field/plur\}$ are currently used for commercial purposes (3)

The various capabilities of $\{e://Field/plur\}$ – that is, what actions and tasks $\{e://Field/plur\}$ are currently able to perform and not perform (4)

***The following item was added to the knowledge questions in 2019*

How $\{e://Field/plur\}$ are currently used by scientists (5)

pilot

Are you a certified commercial pilot?

Yes (1)

No (2)

Finally, we are interested in what “common knowledge” exists about $\{e://Field/plur\}$. Please indicate whether the following are True or False. Please do not “Google” the answers (we are not interested in what people can Google!). If you do not know, then please do just guess – this will tell us what people are likely to think, even if they do not know for sure.

*Note that only one item of each pair was administered (randomly selected) and the order of items administered/displayed was in randomized order determined by the survey software.

	True (1)	False (2)
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Knw1_4 and _5

FAA Regulations state that $\{e://Field/plur\}$ must follow temporary flight restrictions around stadiums and racetracks. (1_4)

FAA Regulations state that $\{e://Field/plur\}$ are prohibited from flying around stadiums and racetracks at any time (1_5)

Knw2_4 and _5

Unless granted a waiver, most $\{e://Field/plur\}$ should stay below 400 feet. (2_4)

Unless granted a waiver, most $\{e://Field/plur\}$ should be flown above 500 feet. (2_5)

Knw3_6 and _7

Business can request exemptions from certain FAA regulations regarding the use of $\{e://Field/plur\}$. (3_6)

Currently, the FAA does not allow any exemptions from regulations regarding the use of $\{e://Field/plur\}$. (3_7)

Knw4_8 and _9

Unless they receive a waiver, operators must keep $\{e://Field/plur\}$ in their sight. (4_8)

Operators are only allowed to fly $\{e://Field/plur\}$ outside of their line of sight if the $\{e://Field/plur\}$ are equipped with GPS tracking technologies. (4_9)

Knw5_10 and _11

The Modernization Reform Act of 2012 required the FAA to create rules for the use of $\{e://Field/plur\}$ in the U.S. (5_10)

Most of the rules regulating the use of $\{e://Field/plur\}$ in the U.S. were established by the FAA in 1995. (5_11)

APPENDIX A.2 – SURVEY VARIABLE MANIPULATIONS

Experimental conditions are administered through the following scenario which has a number of variables. At times these variables are also used in the text of certain measures or items.

The form of the “Scenario” is as follows, with many variables denoted that are filled in depending on the experimental conditions.

Public Perceptions of Aerial Technologies Survey

Imagine that...

For the next questions, imagine that $\${pubpriv}$ has established $\${agency}$ that is investigating the use of $\${shortplur}$ to $\${todo}$. For example, the $\${pubprivshort}$ is considering that, by investing in certain $\${short}$ developments, the $\${shortplur}$ might $\${propretxt}$. The $\${shortplur}$ they are using are $\${autontxt}$

In Survey Flow within Qualtrics, fields are used to randomly assign experimental conditions. The meaning of the fields is as follows.

For one of 4 terminology (e.g., $\${e://Field/shortplur}$) conditions:

ED Set Embedded Data:

- sing = drone
- plur = drones
- art = a drone
- capart = A drone
- short = drone
- shortplur = drones

[Add a New Field](#)

ED Set Embedded Data:

- sing = unmanned aerial vehicle (UAV)
- plur = unmanned aerial vehicles (UAVs)
- art = an unmanned aerial vehicle (UAV)
- capart = An unmanned aerial vehicle (UAV)
- short = UAV
- shortplur = UAVs

[Add a New Field](#)

ED Set Embedded Data:

- sing = aerial robot
- plur = aerial robots
- art = an aerial robot
- capart = An aerial robot
- short = aerial robot
- shortplur = aerial robots

[Add a New Field](#)

ED Set Embedded Data:

- sing = unmanned aerial system (UAS)
- plur = unmanned aerial systems (UASs)
- art = an unmanned aerial system (UAS)
- capart = An unmanned aerial system (UAS)
- short = UAS
- shortplur = UASs

[Add a New Field](#)

For one of two UAT user conditions (e.g., $\$ \{pubpriv\}$, and see also $\$ \{agency\}$ in the last table of the appendix):

ED Set Embedded Data:

- pubpriv = a private U.S. company
- pubprivshort = company
- pubprivposs = private U.S. companies'
- pubprivplur = private U.S. companies
- pubprivcap = Private U.S. companies

[Add a New Field](#)

ED Set Embedded Data:

- pubpriv = the U.S. government
- pubprivshort = government agency
- pubprivposs = the government's
- pubprivplur = the government
- pubprivcap = The government

[Add a New Field](#)

For one of 3 levels of autonomy (e.g., $\{e://Field/autontxt\}$):

ED Set Embedded Data:

- auton = full
- autontxt = fully autonomous, meaning that they are entirely controlled by computers that have been programmed to guide their actions. Human manual control is not used.

[Add a New Field](#)

[Add Below](#) [Move](#) [Duplicate](#) [Add From Contacts](#) [Options](#) [Delete](#)

ED Set Embedded Data:

- auton = partial
- autontxt = partially autonomous, meaning that they are controlled both by computers that have been programmed to guide their actions, and manually by humans trained to control them remotely.

[Add a New Field](#)

[Add Below](#) [Move](#) [Duplicate](#) [Add From Contacts](#) [Options](#) [Delete](#)

ED Set Embedded Data:

- auton = not
- autontxt = not autonomous, meaning that they are entirely manually controlled by people with remote controls that have been trained to guide the $\{e://Field/short\}$ actions. Computer automated controls are not used.

[Add a New Field](#)

Other details depended on purpose (environmental, security, economic), actor (govt vs. private business) and regulatory focus (promotion or prevention) as follows:

<u>Purposes</u>	Promotion Focus	Prevention Focus
Environment	<p>\$Todo...(UATs used to...)</p> <p>\$Propretxt...(for example...)</p> <p>discover or create additional natural resources in our country...</p> <p>...be used to gather water samples in order to discover and document clean water sources, or other sources of valuable natural resources</p>	<p>\$Todo...</p> <p>\$Propretxt...</p> <p>monitor and protect natural resources in our country...</p> <p>... be used to gather water samples in order to detect water quality problems, or other threats to valuable natural resources</p>
Security	<p>promote public confidence in everyday security....</p> <p>...actively seek out illegal activities, potentially allowing for the prosecution and punishment of a greater number of crimes happening on U.S. soil, resulting in increases in public safety</p>	<p>prevent public concerns about everyday security...</p> <p>...help monitor and prevent harm from illegal activities, potentially allowing the prevention of increases in crimes happening on U.S. soil</p>
Economic	<p>promote economic growth...</p> <p>...make tasks such as package delivery more efficient, possibly allowing business owners to expand their businesses and profits and become more</p>	<p>prevent economic decline...</p> <p>...make tasks such as package delivery more efficient, possibly allowing business owners to cut losses and costs and avoid business closures, thereby</p>

	competitive, thereby improving the U.S. economy	helping the U.S. economy to remain stable
Science (Weather) (2019)	gather weather and climate data and enhance weather forecasts... ... gather more types of weather data (e.g., wind, precipitation, aerosols) over more areas, allowing greater and faster advances in the study of climate change and the weather	monitor weather and climate patterns and enhance weather warnings... ...reduce negative effects from climate change by contributing to more precise weather warnings with greater lead times, allowing people to evacuate prior to disasters
Agencies	Govt	Private
Economic	a new Institute of Economic Development	an Economic Development Research Unit
Environment	a new Institute of Environmental Enhancement (2019) a new Institute of Environmental Studies	an Environmental Enhancement Research Unit (2019) an Environmental Studies Research Unit
Security	a new Institute of Public Safety and Security	a Public Safety and Security Research Unit
Science (Weather) (2019)	a new Institute of Climate and Weather Science	a Climate and Weather Science Research Unit

Examples:

For the next questions, imagine that **PubPriv** has established **Agency** that is investigating the use of **ShortPlur** to **ToDo**. For example, the **PubPrivShort** is considering that, by investing in certain **Short** developments, the **ShortPlur** might **Propertxt**. The **ShortPlur** they are using are **Autontxt**

For the next questions, imagine that a private U.S. company has established an Economic Development Research Unit that is investigating the use of aerial robots to promote economic growth. For example, the company is considering that, by investing in certain aerial robot developments, the aerial robots might make tasks such as package delivery more efficient, possibly allowing business owners to expand their businesses and profits and become more competitive, thereby improving the U.S. economy. The aerial robots they are using are not autonomous, meaning that they are entirely manually controlled by people with remote controls that have been trained to guide the aerial robot actions. Computer automated controls are not used.

For the next questions, imagine that a private U.S. company has established a Public Safety and Security Research Unit that is investigating the use of UAVs to promote public confidence in everyday security. For example, the company is considering that, by investing in certain UAV developments, the UAVs might actively seek out illegal activities, potentially allowing for the prosecution and punishment of a greater number of crimes happening on U.S. soil, resulting in increases in public safety. The UAVs they are using are fully autonomous, meaning that they are entirely controlled by computers that have been programmed to guide their actions. Human manual control is not used.

For the next questions, imagine that the U.S. government has established a new Institute of Environmental Enhancement that is investigating the use of UAVs to discover or create additional natural resources in our country. For example, the government agency is considering that, by investing in certain UAV developments, the UAVs might be used to gather water samples in order to discover and document clean water sources, or other sources of valuable natural resources. The UAVs they are using are fully autonomous, meaning that they are entirely controlled by computers that have been programmed to guide their actions. Human manual control is not used.

For the next questions, imagine that a private U.S. company has established a Climate and Weather Science Research Unit that is investigating the use of aerial robots to gather weather and climate data and enhance weather forecasts. For example, the company is considering that, by investing in certain aerial robot developments, the aerial robots might gather more types of weather data (e.g., wind, precipitation, aerosols) over more areas, allowing greater and faster advances in the study of climate change and the weather. The aerial robots they are using are fully autonomous, meaning that they are entirely controlled by computers that have been programmed to guide their actions. Human manual control is not used.

For the next questions, imagine that the U.S. government has established a new Institute of Climate and Weather Science that is investigating the use of UASs to monitor weather and climate patterns and enhance weather warnings. For example, the government agency is considering that, by investing in certain UAS developments, the UASs might reduce negative effects from climate change by contributing to more precise weather warnings with greater lead times, allowing people to evacuate prior to disasters. The UASs they are using are partially autonomous, meaning that they are controlled both by computers that have

been programmed to guide their actions, and manually by humans trained to control them remotely.

For the next questions, imagine that a private **U.S. company** has established **a Climate and Weather Science Research Unit** that is investigating the use of **UAVs** to **monitor weather and climate patterns and enhance weather warnings**. For example, the company is considering that, by investing in certain UAV developments, the UAVs might **reduce negative effects from climate change by contributing to more precise weather warnings with greater lead times, allowing people to evacuate prior to disasters**. The UAVs they are using are partially autonomous, meaning that they are controlled both by computers that have been programmed to guide their actions, and manually by humans trained to control them remotely.

Recall that you are imagining that...

...a private U.S. company has established **a Climate and Weather Science Research Unit** that is investigating the use of aerial robots to gather weather and climate data and enhance weather forecasts. For example, the company is considering that, by investing in certain aerial robot developments, the aerial robots might gather more types of weather data (e.g., wind, precipitation, aerosols) over more areas, allowing greater and faster advances in the study of climate change and the weather. The aerial robots they are using are partially autonomous, meaning that they are controlled both by computers that have been programmed to guide their actions, and manually by humans trained to control them remotely.

2014-15

att to drones 2014

Start of Block: Consent

Q2

IRB #: 20140614424EP

Valid until:6/08/2016

Title: Public Perceptions of Aerial Technologies Survey

This survey assesses public opinions about Aerial Technologies. You must be 17 years of age or older to participate and live in America. You do not need to know anything about the technologies before participating. You are invited to participate in this study because you are a worker for Amazon MTurk.

In this survey you will be asked to give your opinions and answer some questions about yourself (e.g., age, gender, political party). The survey takes about 10 minutes and is completed online.

There are no direct benefits or risks of this survey, but you may enjoy giving your opinions.

Any information obtained during this study which could identify you will be kept strictly confidential. The data will be stored on a secure server and will be seen by the investigators during the study and de-identified data (data with all identity information removed) could be shared with other researchers for reanalysis after the study is complete. The information obtained in this study may be published in scientific journals or presented at scientific meetings. Most data will be reported as aggregated data but individual quotes also may be taken from the open-ended questions to illustrate results.

Participation in this study is voluntary and you will receive the amount indicated on the MTurk website for completing the survey (25 cents). The award will be administered through MTurk.

You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study. Or you may contact the investigator(s) at the phone numbers or emails below. Please contact the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965 to voice concerns about the research or if you have any questions about your rights as a research

participant.

You are voluntarily making a decision whether or not to participate in this research study. You also can withdraw at any time without harming your relationship with the researchers or the University of Nebraska-Lincoln, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled. Your completion of the survey indicates that you have decided to participate having read and understood the information presented. If you would like a copy of this consent form, please print it from your browser now.

Name and Phone number of investigator(s)

Lisa PytlikZillig, Principal Investigator Office: (402) 472-6877 lpytlikz@nebraska.edu
Sebastian Elbaum, Secondary Investigator Office: (402) 472-6748 elbaum@cse.unl.edu

End of Block: Consent

Start of Block: Drone block

Q5

Public Perceptions of Aerial Technologies Survey

As you complete this survey, please do not “google” the topics. We are interested in whatever comes to your mind first.

haveheard **Have you heard of $\$(e://Field/plur)?$**

- Yes (1)
- No (2)
- Unsure (3)

Display This Question:

If Have you heard of $\{e://Field/plur\}$? = Yes

Or Have you heard of $\{e://Field/plur\}$? = Unsure

exampletext If you are able, please give an example or two of where and what have you heard about them.

describtext Briefly describe what you think $\{e://Field/art\}$ is.

Page Break

Q8 We are interested in what people think and feel about $\{e://Field/plur\}$. Here is how we define $\{e://Field/plur\}$:

" $\{e://Field/capart\}$ is an aircraft without a human pilot aboard. Its flight is controlled either autonomously by onboard computers or by the remote control of a pilot on the ground or in another vehicle."

concerntxt **What are one or two concerns that come to mind when you think of $\{e://Field/plur\}$?**

hopestxt **What are one or two hopes or benefits that come to mind when you think of $\{e://Field/plur\}$?**

Page Break

Q10
Public Perceptions of Aerial Technologies Survey

Imagine that...

For the next questions, imagine that $\{e://Field/pubpriv\}$ has established $\{e://Field/agency\}$ that is

investigating the use of $\{e://Field/shortplur\}$ to $\{e://Field/todo\}$. For example, the $\{e://Field/pubprivshort\}$ is considering that, by investing in certain $\{e://Field/short\}$ developments, the $\{e://Field/shortplur\}$ might $\{e://Field/propetxt\}$. The $\{e://Field/shortplur\}$ they are using are $\{e://Field/autontxt\}$

howlong In your opinion, how long will it be before $\{e://Field/plur\}$ are used as described above?

- They are used that way NOW (1)
 - 1-5 years (2)
 - 5-10 years (3)
 - 10-20 years (4)
 - 20-50 years (5)
 - More than 50 years (6)
 - They will NEVER be used that way (7)
-

appr To what extent do you approve of $\{e://Field/pubprivplur\}$ using $\{e://Field/plur\}$ for the purposes described above?

- StronglyDisapprove (1)
- Disapprove (2)
- SlightlyDisapprove (3)
- Neutral/No opinion (4)
- Slightly Approve (5)

- Approve (6)
- Strongly Approve (7)

supres **To what extent would you support or resist $\{e://Field/pubprivposs\}$ use of $\{e://Field/plur\}$ for the purposes described above?** For example, how willing would you be to vote to allow such uses or have public funds promote such uses?

- Strongly Resist (1)
- Resist (2)
- Slightly Resist (3)
- Neutral/Neither (4)
- Slightly Support (5)
- Support (6)
- Strongly Support (7)



trust **Below, indicate your opinions about how $\{e://Field/pubprivplur\}$ would behave when using $\{e://Field/plur\}$ for the purposes described above:**

$\{e://Field/pubprivcap\}$ would...

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Usually (5)	Always (6)
Only use the $\{e://Field/sing\}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>to benefit the public at large (Q13_1)</p> <p>Use the <code>#{e://Field/sing}</code> for their own selfish benefit (Q13_2)</p> <p>Be competent in their use of <code>#{e://Field/plur}</code> (Q13_3)</p> <p>Be incompetent in their attempts to use the <code>#{e://Field/plur}</code> (Q13_4)</p> <p>Be honest with the public about anything they find or do using the <code>#{e://Field/plur}</code> (Q13_5)</p> <p>Be dishonest about anything they find or do using the <code>#{e://Field/plur}</code> (Q13_6)</p> <p>Be transparent (open) about how, when, and why they are using the <code>#{e://Field/plur}</code></p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>(Q13_7)</p> <p>Hide information about how, when and why they are using the $\{e://Field/plur\}$ (Q13_8)</p> <p>Use the $\{e://Field/plur\}$ to achieve values important to you (Q13_9)</p>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>
<p>Use $\{e://Field/plur\}$ to support values that you disagree with (Q13_10)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

comment You are almost finished with the survey. If you have any comments on the survey questions above, especially comments that might help us to improve this survey, please write them below.

For example, were there any unclear questions or did anything not make sense? All comments are welcome.

End of Block: Drone block

Start of Block: Demographics

Q17

About You

Finally, on this last page, please complete the following questions about you.



atts To what extent do you agree with the following?

	Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neutral (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)
I focus on opportunities that will enhance my life (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am primarily motivated by seeking potential successes (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I focus on ensuring that I will avoid potential mishaps or	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

negative events (3)							
I am primarily motivated by avoiding failure. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe protection of our environmental resources should be the nation's top priority. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe U.S. national security should be the nation's top priority. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that a strong U.S. economy should be the nation's top priority. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

age **What is your age?**

gender **What is your gender?**

Male (1)

Female (2)

race **What is your race/ethnicity? (check all that apply)**

White (1)

Black or African American (2)

Native Hawaiian or other Pacific Islander (3)

Asian (4)

American Indian or Alaska Native (5)

hispanic **Are you Spanish, Hispanic, or Latino?**

Yes (1)

No (2)

polparty **In politics today do you consider yourself a Republican, Democrat, or Independent/other?**

Strong Democrat (1)

Democrat (2)

- Weak and leaning Democrat (3)
- Independent/Other (4)
- Weak and leaning Republican (5)
- Republican (6)
- Strong Republican (7)



ideology **Ideologically, which of the following best describes you?**

	Strongly Liberal (1)	Moderately Liberal (2)	Weakly Liberal (3)	Centrist / Middle of the Road (4)	Weakly Conservative (5)	Moderately Conservative (6)	Strongly Conservative (7)
Overall (ideology_ov)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When it comes to ECONOMIC issues (ideology_ec)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When it comes to SOCIAL issues (ideology_so)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Demographics

2016-18

att to drones 2016 sept - Qualtrics Panel

Start of Block: Consent

Q2

IRB #: 20140614424EP

Valid until:6/30/2017

Title: Public Perceptions of Aerial Technologies Survey (Qualtrics)

This survey assesses public opinions about Aerial Technologies. You must be 17 years of age or older to participate and live in America. You do not need to know anything about the technologies before participating. You are invited to participate in this study because you are a panelist for Qualtrics.

In this survey you will be asked to give your opinions and answer some questions about yourself (e.g., age, gender, political party). The survey takes about 15 minutes and is completed online.

There are no direct benefits or risks of this survey, but you may enjoy giving your opinions.

Any information obtained during this study which could identify you will be kept strictly confidential. The data will be stored on a secure server and will be seen by the investigators during the study and de-identified data (data with all identity information removed) could be shared with other researchers for reanalysis after the study is complete. The information obtained in this study may be published in scientific journals or presented at scientific meetings. Most data will be reported as aggregated data but individual quotes also may be taken from the open-ended questions to illustrate results.

Participation in this study is voluntary and you will receive the amount indicated by Qualtrics for completing the survey. You will be compensated through your panel provider, Qualtrics.

You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study. Or you may contact the investigator(s) at the phone numbers or emails below. Please contact the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965 to voice concerns about the research or if you have any questions about your rights as a research participant.

You are voluntarily making a decision whether or not to participate in this research study. You also can withdraw at any time without harming your relationship with the researchers or the University of Nebraska-Lincoln, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled. Your completion of the survey indicates that you have decided to participate having read and understood the information presented. If you would like a copy of this consent form, please print it from your browser now.

Name and Phone number of investigator(s)

Lisa PytlikZillig, Principal Investigator Office: (402) 472-6877 lpytlikz@nebraska.edu
Sebastian Elbaum, Secondary Investigator Office: (402) 472-6748 elbaum@cse.unl.edu

End of Block: Consent

Start of Block: Demographics1



age **What is your age?**

Skip To: End of Block If If What is your age? Is Less Than or Equal to 17, Then Skip To End of Block

gender **What is your gender?**

Male (1)

Female (2)

race **What is your race/ethnicity? (check all that apply)**

- White (1)
- Black or African American (2)
- Native Hawaiian or other Pacific Islander (3)
- Asian (4)
- American Indian or Alaska Native (5)
- Spanish, Hispanic, or Latino/a (6)
- Other (please specify) (7) _____

End of Block: Demographics1

Start of Block: Drone block

Q5

Public Perceptions of Aerial Technologies Survey

As you complete this survey, please do not “google” the topics. We are interested in whatever comes to your mind first.

haveheard **Have you heard of $\$ \{e://Field/plur\}$?**

- Yes (1)
- No (2)
- Unsure (3)

Display This Question:

If Have you heard of $\{e://Field/plur\}$? = Yes

Or Have you heard of $\{e://Field/plur\}$? = Unsure

exampletext If you are able, please give an example or two of where and what have you heard about them.

describtext Briefly describe what you think $\{e://Field/art\}$ is.

Page Break

Q8 We are interested in what people think and feel about $\{e://Field/plur\}$. Here is how we define $\{e://Field/plur\}$:

" $\{e://Field/capart\}$ is an aircraft without a human pilot aboard. Its flight is controlled either

autonomously by onboard computers or by the remote control of a pilot on the ground or in another vehicle."

concerntxt **What are one or two concerns that come to mind when you think of $\{e://Field/plur\}$?**

hopestxt **What are one or two hopes or benefits that come to mind when you think of $\{e://Field/plur\}$?**

Page Break

Q10
Public Perceptions of Aerial Technologies Survey

Imagine that...

For the next questions, imagine that $\{e://Field/pubpriv\}$ has established $\{e://Field/agency\}$ that is investigating the use of $\{e://Field/shortplur\}$ to $\{e://Field/todo\}$. For example, the $\{e://Field/pubprivshort\}$ is considering that, by investing in certain $\{e://Field/short\}$ developments, the $\{e://Field/shortplur\}$ might $\{e://Field/propretxt\}$. The $\{e://Field/shortplur\}$ they are using are $\{e://Field/autontxt\}$

howlong In your opinion, how long will it be before $\{e://Field/plur\}$ are used as described above?

- They are used that way NOW (1)
 - 1-5 years (2)
 - 5-10 years (3)
 - 10-20 years (4)
 - 20-50 years (5)
 - More than 50 years (6)
 - They will NEVER be used that way (7)
-

appr To what extent do you approve of $\{e://Field/pubprivplur\}$ using $\{e://Field/plur\}$ for the purposes described above?

- StronglyDisapprove (1)
- Disapprove (2)
- SlightlyDisapprove (3)
- Neutral/No opinion (4)

- Slightly Approve (5)
 - Approve (6)
 - Strongly Approve (7)
-

supres **To what extent would you support or resist $\{e://Field/pubprivposs\}$ use of $\{e://Field/plur\}$ for the purposes described above?** For example, how willing would you be to vote to allow such uses or have public funds promote such uses?

- Strongly Resist (1)
 - Resist (2)
 - Slightly Resist (3)
 - Neutral/Neither (4)
 - Slightly Support (5)
 - Support (6)
 - Strongly Support (7)
-



trustUser **Below, indicate your opinions about how $\{e://Field/pubprivplur\}$ would behave when using $\{e://Field/plur\}$ for the purposes described above:**

$\{e://Field/pubprivcap\}$ would...

	Never or Almost	Rarely (2)	Sometimes (3)	Often (4)	Usually (5)	Always or Almost
--	-----------------	------------	---------------	-----------	-------------	------------------

	Never (1)					Always (6)
Only use the $\{e://Field/sing\}$ to benefit the public at large (Q13_1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use the $\{e://Field/sing\}$ for their own selfish benefit (Q13_2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Be competent in their use of $\{e://Field/plur\}$ (Q13_3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Be incompetent in their attempts to use the $\{e://Field/plur\}$ (Q13_4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Be honest with the public about anything they find or do using the $\{e://Field/plur\}$ (Q13_5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Be dishonest about anything they find or do using the $\{e://Field/plur\}$ (Q13_6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Be transparent (open) about how, when, and	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>why they are using the $\{e://Field/plur\}$ (Q13_7)</p> <p>Hide information about how, when and why they are using the $\{e://Field/plur\}$ (Q13_8)</p> <p>Use the $\{e://Field/plur\}$ to achieve values important to you (Q13_9)</p> <p>Use $\{e://Field/plur\}$ to support values that you disagree with (Q13_10)</p> <p>Use the $\{e://Field/plur\}$ in ways that are appropriate to each situation. (trust_11)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>This is an attention check: Please choose "Often" as your response to this item. (trustUser_12)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Skip To: End of Block If Below, indicate your opinions about how $\{e://Field/pubprivplur\}$ would behave when using ...
 != This is an attention check: Please choose "Often" as your response to this item. [Often]

Page Break

Q33

Public Perceptions of Aerial Technologies (Continued...)

Recall that you are imagining that...

... $\{e://Field/pubpriv\}$ has established $\{e://Field/agency\}$ that is investigating the use of $\{e://Field/shortplur\}$ to $\{e://Field/todo\}$. For example, the $\{e://Field/pubprivshort\}$ is considering that, by investing in certain $\{e://Field/short\}$ developments, the $\{e://Field/shortplur\}$ might $\{e://Field/propretxt\}$. The $\{e://Field/shortplur\}$ they are using are $\{e://Field/autontxt\}$



trustReg Indicate the extent to which you agree with the following statements as they relate to the likely **REGULATORS** of the $\{e://Field/plur\}$ for the specific purposes described.

What do you think? How well do the following statements describe those who regulate the $\{e://Field/plur\}$ for the described purposes...

	Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neither Agree or Disagree (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)
They care about the people they	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

affect. (1)								
They are incompetent. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They are honest. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They share your important values. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They would share information openly and quickly when asked. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They are legitimate authorities. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They lack concern for those they affect. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They are highly competent. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, they are dishonest. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They do not support your	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

values. (10)							
They are secretive. (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They have no right to tell people what to do. (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They have the resources needed to do their job. (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



trustUAT Indicate the extent to which you think the following would happen, as related to the \$f://Field/plur that are used for the specific purpose described. What do you think? When used for the described purposes, how often would the \$f://Field/plur...

	Never or Almost Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Usually (5)	Always or Almost Always (6)
Malfunction (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Function reliably as expected (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Result in injuries to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

people (3)						
Increase people's safety on the ground (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Result in destruction of property (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Result in protection of people's property (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Threaten people's privacy (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protect people's privacy (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Achieve their intended purposes (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fail to achieve their intended purposes (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Result in unintended negative effects (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Result in unintended positive effects (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Increase pilot safety (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increase the safety of other people in the air (i.e., in manned aircrafts) (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

comm_mid If you have any other comments about the use of $\{e://Field/plur\}$ for this purpose, or about those who might design, use, or regulate the $\{e://Field/plur\}$, please type them here.

End of Block: Drone block

Start of Block: Demographics2

Q17

About You

You are almost done! Please complete the following questions about you.



atts To what extent do you agree with the following?

	Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neither Agree or Disagree (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)
I focus on opportunities that will enhance my life. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am primarily motivated by seeking potential successes. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I focus on ensuring that I will avoid potential mishaps or negative events. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am primarily motivated by avoiding failure. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe protection of our environmental resources should be the nation's top priority. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I believe U.S. national security should be the nation's top priority. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that a strong U.S. economy should be the nation's top priority. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This is an attention check: Please choose "Disagree" for this item. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Skip To: End of Block If To what extent do you agree with the following? != This is an attention check: Please choose "Disagree" for this item. [Disagree]

polparty In politics today do you consider yourself a Republican, Democrat, or Independent/other?

- Strong Democrat (1)
- Democrat (2)
- Weak and leaning Democrat (3)
- Independent/Other (4)
- Weak and leaning Republican (5)
- Republican (6)

Strong Republican (7)



ideology Ideologically, which of the following best describes you?

	Strongly Liberal (1)	Moderately Liberal (2)	Weakly Liberal (3)	Centrist / Middle of the Road (4)	Weakly Conservative (5)	Moderately Conservative (6)	Strongly Conservative (7)
Overall (ideology_ov)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When it comes to ECONOMIC issues (ideology_ec)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When it comes to SOCIAL issues (ideology_so)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



subjknow To what extent do you feel knowledgeable about the following?

	Not at all (1)	Slightly (2)	Somewhat (3)	Very (4)	Extremely (5)
--	----------------	--------------	--------------	----------	---------------

<p>The regulations surrounding the use of $\{e://Field/plur\}$ for commercial or private use (1)</p> <p>How $\{e://Field/plur\}$ are currently used by the government (2)</p> <p>How $\{e://Field/plur\}$ are currently used for commercial purposes (3)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>The various capabilities of $\{e://Field/plur\}$ -- that is, what actions and tasks $\{e://Field/plur\}$ are currently able to perform and not perform (4)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

pilot Are you a certified or commercial pilot?

Yes (1)

No (2)

End of Block: Demographics2

Start of Block: Block 3

Q42

Common Knowledge? Or not so much?

Finally, we are interested in what "common knowledge" exists about $\{e://Field/plur\}$. Please indicate whether the following are True or False.

Please do not "google" the answers (we are not interested in what people can google!).

If you do not know, then please do just guess -- this will tell us what people are likely to think, even if they do not know for sure.



knw1

	True (1)	False (2)
FAA regulations state that $\{e://Field/plur\}$ must follow temporary flight restrictions around stadiums and racetracks. (4)	<input type="radio"/>	<input type="radio"/>
FAA regulations state that $\{e://Field/plur\}$ are prohibited from flying around stadiums and racetracks at any time. (5)	<input type="radio"/>	<input type="radio"/>



knw2

	True (1)	False (2)
Unless granted a waiver, most $\S\{e://Field/plur\}$ should stay below 400 feet. (4)	<input type="radio"/>	<input type="radio"/>
Unless granted a waiver, most $\S\{e://Field/plur\}$ should be flown above 500 feet. (5)	<input type="radio"/>	<input type="radio"/>



knw3

	True (1)	False (2)
Businesses can request exemptions from certain FAA regulations regarding the use of $\S\{e://Field/plur\}$. (6)	<input type="radio"/>	<input type="radio"/>
Currently, the FAA does not allow any exemptions from regulations regarding the use of $\S\{e://Field/plur\}$. (7)	<input type="radio"/>	<input type="radio"/>



knw4

	True (1)	False (2)
Unless they receive a waiver, operators must keep $\{e://Field/plur\}$ in their sight. (8)	<input type="radio"/>	<input type="radio"/>
Operators are only allowed to fly $\{e://Field/plur\}$ outside of their line of sight if the $\{e://Field/plur\}$ are equipped with GPS tracking technologies. (9)	<input type="radio"/>	<input type="radio"/>



knw5

	True (1)	False (2)
The Modernization Reform Act of 2012 required the FAA to create rules for the use of $\{e://Field/plur\}$ in the U.S. (10)	<input type="radio"/>	<input type="radio"/>
Most of the rules regulating use of $\{e://Field/plur\}$ in the U.S. were established by the FAA in 1995. (11)	<input type="radio"/>	<input type="radio"/>

End of Block: Block 3

Start of Block: Block 4

comm_end

This is the end of the survey.

THANK YOU!

If you have any comments on the survey questions above, especially comments that might help us to improve this survey, please write them below.

For example, were there any unclear questions or did anything not make sense? All comments are welcome.

Q38 When you are finished, please submit your survey using the button below.

End of Block: Block 4

2019

att to drones 2019 june - Qualtrics Panel

Start of Block: Consent

Q2

IRB #: 20140614424EP

Title: Public Perceptions of Aerial Technologies Survey (Qualtrics)

This survey assesses public opinions about Aerial Technologies. You must be 17 years of age or older to participate and live in America. You do not need to know anything about the technologies before participating. You are invited to participate in this study because you are a panelist for Qualtrics.

In this survey you will be asked to give your opinions and answer some questions about yourself (e.g., age, gender, political party). The survey takes about 15 minutes and is completed online.

There are no direct benefits or risks of this survey, but you may enjoy giving your opinions.

Any information obtained during this study which could identify you will be kept strictly confidential. The data will be stored on a secure server and will be seen by the investigators during the study and de-identified data (data with all identity information removed) could be shared with other researchers for reanalysis after the study is complete. The information obtained in this study may be published in scientific journals or presented at scientific meetings. Most data will be reported as aggregated data but individual quotes also may be taken from the open-ended questions to illustrate results.

Participation in this study is voluntary and you will receive the amount indicated by your panel provider for completing the survey. You will be compensated through your panel provider, if you entirely complete the survey.

You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study. Or you may contact the investigator(s) at the phone numbers or emails below. Please contact the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965 to voice concerns about the research or if you have any questions about your rights as a research

participant.

You are voluntarily making a decision whether or not to participate in this research study. You also can withdraw at any time without harming your relationship with the researchers or the University of Nebraska-Lincoln, or in any other way receive a penalty or loss of benefits to which you are otherwise entitled. Your completion of the survey indicates that you have decided to participate having read and understood the information presented. If you would like a copy of this consent form, please print it from your browser now.

Name and Phone number of investigator(s)

Lisa PytlikZillig, Principal Investigator Office: (402) 472-6877 lpytlikz@nebraska.edu
Carrick Detweiler, Secondary Investigator Office: (402) 472-2449 carrick@cse.unl.edu

p1time_consent Timing

First Click (1)

Last Click (2)

Page Submit (3)

Click Count (4)

End of Block: Consent

Start of Block: Demographics1



age What is your age?

gender **What is your gender?**

Male (1)

Female (2)

race **What is your race/ethnicity? (check all that apply)**

White (1)

Black or African American (2)

Native Hawaiian or other Pacific Islander (3)

Asian (4)

American Indian or Alaska Native (5)

Spanish, Hispanic, or Latino/a (6)

Other (please specify) (7) _____

p2time_demo Timing

First Click (1)

Last Click (2)

Page Submit (3)

Click Count (4)

End of Block: Demographics1

Start of Block: drones 1 general

Q5

Public Perceptions of Aerial Technologies Survey

As you complete this survey, please do not “google” the topics. We are interested in whatever comes to your mind first.

haveheard **Have you heard of $\{e://Field/plur\}$?**

Yes (1)

No (2)

Unsure (3)

p3time_dronOE1 Timing

First Click (1)

Last Click (2)

Page Submit (3)

Click Count (4)

Page Break

Q8 We are interested in what people think and feel about $\{e://Field/plur\}$. Here is how we define $\{e://Field/plur\}$:

" $\{e://Field/capart\}$ is an aircraft without a human pilot aboard. Its flight is controlled either autonomously by onboard computers or by the remote control of a pilot on the ground or in another vehicle."



genatt Please indicate the extent to which you agree or disagree with the following statements.

In general, when I think about $\{e://Field/plur\}$...I tend to think...

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
These technologies are awesome. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
These technologies are annoying. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
These technologies are beneficial to society. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

These technologies are dangerous. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
These technologies are safe. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
These technologies are unnecessary. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
These technologies do more harm than good. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
These technologies are more beneficial than they are harmful. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the long run, these technologies will greatly benefit humankind. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the end, humankind will regret having created these	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

technologies. (10)							
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p4time_genatt Timing

First Click (1)

Last Click (2)

Page Submit (3)

Click Count (4)

Page Break

End of Block: drones 1 general

Start of Block: drones 2 scenario

Q10

Public Perceptions of Aerial Technologies Survey

Imagine that...

For the next questions, imagine that $\{e://Field/pubpriv\}$ has established $\{e://Field/agency\}$ that is investigating the use of $\{e://Field/shortplur\}$ to $\{e://Field/todo\}$. For example, the $\{e://Field/pubprivshort\}$ is considering that, by investing in certain $\{e://Field/short\}$ developments, the $\{e://Field/shortplur\}$ might $\{e://Field/propretxt\}$. The $\{e://Field/shortplur\}$ they are using are $\{e://Field/autontxt\}$

Before going on, answer the questions below...

rdck_who 1. Who is using the [\\${e://Field/shortplur}](#) in this scenario?

- The U.S. Government (1)
 - A private U.S. company (2)
-

rdck_what 2. Are the [\\${e://Field/shortplur}](#) autonomous or manually controlled?

- Manually controlled (1)
 - Partially autonomous (2)
 - Fully autonomous (3)
-

rdck_why 3. What are the [\\${e://Field/shortplur}](#) used for in this scenario?

- Environmental purposes (Natural resources monitoring and exploration) (1)
 - Security purposes (2)
 - Economic growth (3)
 - Weather and climate studies (4)
-

p5time_readchk Timing

First Click (1)

Last Click (2)

Page Submit (3)

Click Count (4)

Display This Question:

If pubprivshort = company

And 1. Who is using the $\{e://Field/shortplur\}$ in this scenario? != A private U.S. company

Or If

pubprivshort = government agency

And 1. Who is using the $\{e://Field/shortplur\}$ in this scenario? != The U.S. Government

Q49 Please use the back button and check and change your answer to question 1; your current answer is incorrect.

Display This Question:

If auton = full

And 2. Are the $\{e://Field/shortplur\}$ autonomous or manually controlled? != Fully autonomous

Or If

auton = partial

And 2. Are the $\{e://Field/shortplur\}$ autonomous or manually controlled? != Partially autonomous

Or If

auton = not

And 2. Are the $\{e://Field/shortplur\}$ autonomous or manually controlled? != Manually controlled

Q51 Please use the back button and check and change your answer to question 2; your current answer is incorrect.

Display This Question:

If purp = env

And 3. What are the $\{e://Field/shortplur\}$ used for in this scenario? != Environmental purposes (Natural resources monitoring and exploration)

Or If

purp = sec

And 3. What are the $\{e://Field/shortplur\}$ used for in this scenario? != Security purposes

Or If

purp = econ

And 3. What are the $\{e://Field/shortplur\}$ used for in this scenario? != Economic growth

Or If

purp = sci

And 3. What are the $\{e://Field/shortplur\}$ used for in this scenario? != Weather and climate studies

Q52 Please use the back button and check and change your answer to [question 3](#); your current answer is incorrect.

End of Block: drones 2 scenario

Start of Block: drones 3 spec qs

Q45

Public Perceptions of Aerial Technologies Survey

The correct answers were that $\{e://Field/pubpriv\}$ is using $\{e://Field/autonshort\}$ $\{e://Field/shortplur\}$ for $\{e://Field/shorttodo\}$.

Here is the scenario again in case you want to refer to it as you answer the next questions...

... $\{e://Field/pubpriv\}$ has established $\{e://Field/agency\}$ that is investigating the use of $\{e://Field/shortplur\}$ to $\{e://Field/todo\}$. For example, the $\{e://Field/pubprivshort\}$ is considering that, by investing in certain $\{e://Field/short\}$ developments, the $\{e://Field/shortplur\}$ might $\{e://Field/propretxt\}$. The $\{e://Field/shortplur\}$ they are using are $\{e://Field/autontxt\}$

howlong In your opinion, how long will it be before $\{e://Field/plur\}$ are used as described above?

They are used that way NOW (1)

- 1-5 years (2)
 - 5-10 years (3)
 - 10-20 years (4)
 - 20-50 years (5)
 - More than 50 years (6)
 - They will NEVER be used that way (7)
-

appr To what extent do you approve of $\{e://Field/pubprivplur\}$ using $\{e://Field/plur\}$ for the purposes described above?

- StronglyDisapprove (1)
 - Disapprove (2)
 - SlightlyDisapprove (3)
 - Neutral/No opinion (4)
 - Slightly Approve (5)
 - Approve (6)
 - StronglyApprove (7)
-

supres To what extent would you support or resist $\{e://Field/pubprivposs\}$ use of $\{e://Field/plur\}$ for the purposes described above? For example, how willing would you be to vote to allow such uses or have public funds promote such uses?

- Strongly Resist (1)
- Resist (2)
- Slightly Resist (3)
- Neutral/Neither (4)
- Slightly Support (5)
- Support (6)
- Strongly Support (7)



trustUser Below, indicate your opinions about how $\{e://Field/pubprivplur\}$ would behave when using $\{e://Field/plur\}$ for the purposes described above:

$\{e://Field/pubprivcap\}$ would...

	Never or Almost Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Usually (5)	Always or Almost Always (6)
Only use the $\{e://Field/sing\}$ to benefit the public at large (Q13_1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use the $\{e://Field/sing\}$ for their own selfish benefit (Q13_2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Be competent in their use of $\{e://Field/plur\}$ (Q13_3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Be incompetent in their attempts to use the $\{e://Field/plur\}$ (Q13_4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Be honest with the public about anything they find or do using the $\{e://Field/plur\}$ (Q13_5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Be dishonest about anything they find or do using the $\{e://Field/plur\}$ (Q13_6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Be transparent (open) about how, when, and why they are using the $\{e://Field/plur\}$ (Q13_7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hide information about how, when and why they are using the $\{e://Field/plur\}$ (Q13_8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>Use the $\{e://Field/plur\}$ to achieve values important to you (Q13_9)</p> <p>Use $\{e://Field/plur\}$ to support values that you disagree with (Q13_10)</p> <p>Use the $\{e://Field/plur\}$ in ways that are appropriate to each situation. (trust_11)</p>	<input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/> <input type="radio"/>
<p>This is an attention check: Please choose "Often" as your response to this item. (trustUser_12)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Skip To: End of Block If trust user to... != Be incompetent in their attempts to use the $\{e://Field/plur\}$

p5time_userCE1 Timing

First Click (1)

Last Click (2)

Page Submit (3)

Click Count (4)

Q33

Public Perceptions of Aerial Technologies (Continued...)

Again, recall that you are imagining that...

... $\{e://Field/pubpriv\}$ has established $\{e://Field/agency\}$ that is investigating the use of $\{e://Field/shortplur\}$ to $\{e://Field/todo\}$. For example, the $\{e://Field/pubprivshort\}$ is considering that, by investing in certain $\{e://Field/short\}$ developments, the $\{e://Field/shortplur\}$ might $\{e://Field/propretxt\}$. The $\{e://Field/shortplur\}$ they are using are $\{e://Field/autontxt\}$



trustReg Indicate the extent to which you agree with the following statements as they relate to the likely **REGULATORS** of the $\{e://Field/plur\}$ for the specific purposes described.

What do you think? How well do the following statements describe those who regulate the $\{e://Field/plur\}$ for the described purposes...

	Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neither Agree or Disagree (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)
They care about the people they affect. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They are incompetent. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They are	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

honest. (3)							
They share your important values. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They would share information openly and quickly when asked. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They are legitimate authorities. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They lack concern for those they affect. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They are highly competent. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, they are dishonest. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They do not support your values. (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They are secretive. (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They have no right to tell	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

people what to do. (12)							
They have the resources needed to do their job. (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This is an attention check: Please mark 'Disagree' (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Skip To: End of Block If Trust Regulators... != They are incompetent.



trustUAT Indicate the extent to which you think the following would happen, as related to the [\\${e://Field/plur}](#) that are used for the specific purpose described. What do you think? When used for the described purposes, how often would the [\\${e://Field/plur}](#)...

	Never or Almost Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Usually (5)	Always or Almost Always (6)
Malfunction (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Function reliably as expected (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Result in injuries to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

people (3)						
Increase people's safety on the ground (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Result in destruction of property (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Result in protection of people's property (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Threaten people's privacy (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protect people's privacy (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Achieve their intended purposes (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fail to achieve their intended purposes (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Result in unintended negative effects (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Result in unintended positive effects (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Increase pilot safety (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increase the safety of other people in the air (i.e., in manned aircrafts) (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

comm_mid If you have any other comments about the use of $\{e://Field/plur\}$ for this purpose, or about those who might design, use, or regulate the $\{e://Field/plur\}$, please type them here.

p6time_dronCE2 Timing

- First Click (1)
- Last Click (2)
- Page Submit (3)
- Click Count (4)

End of Block: drones 3 spec qs

Start of Block: aboutyou

Q17

About You

You are almost done! Please complete the following questions about you.



atts To what extent do you agree with the following?

	Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neither Agree or Disagree (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)
I focus on opportunities that will enhance my life. (atts_1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am primarily motivated by seeking potential successes. (atts_2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I focus on ensuring that I will avoid potential mishaps or negative events. (atts_3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am primarily	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

motivated by avoiding failure. (atts_4)							
---	--	--	--	--	--	--	--



atts To what extent do you agree with the following?

	Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neither Agree or Disagree (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)
I believe protection of our <u>environmental resources</u> should be the nation's top priority. (atts_5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe U.S. <u>national security</u> should be the nation's top priority. (atts_6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that a strong U.S. <u>economy</u> should be the nation's top priority.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>(atts_7)</p> <p>I believe addressing <u>climate change</u> should be the nation's top priority. (atts_9)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>I believe <u>advancing science</u> should be the nation's top priority. (atts_10)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



polparty In politics today do you consider yourself a Republican, Democrat, or Independent/other?

- Strong Democrat (1)
- Democrat (2)
- Weak and leaning Democrat (3)
- Independent/Other (4)
- Weak and leaning Republican (5)
- Republican (6)
- Strong Republican (7)





ideology Ideologically, which of the following best describes you?

	Strongly Liberal (1)	Moderately Liberal (2)	Weakly Liberal (3)	Centrist / Middle of the Road (4)	Weakly Conservative (5)	Moderately Conservative (6)	Strongly Conservative (7)
Overall (ideology_ov)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When it comes to ECONOMIC issues (ideology_ec)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When it comes to SOCIAL issues (ideology_so)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



subjknow To what extent do you feel knowledgeable about the following?

	Not at all (1)	Slightly (2)	Somewhat (3)	Very (4)	Extremely (5)
The regulations surrounding the use of $\{e://Field/plur\}$ for commercial or private use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>(1)</p> <p>How $\{e://Field/plur\}$ are currently used by the government (2)</p> <p>How $\{e://Field/plur\}$ are currently used for commercial purposes (3)</p> <p>The various capabilities of $\{e://Field/plur\}$ -- that is, what actions and tasks $\{e://Field/plur\}$ are currently able to perform and not perform (4)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>How $\{e://Field/plur\}$ are currently used by scientists (5)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



pilot Are you a certified or commercial pilot?

Yes (1)

No (2)

p7time_dronCE3 Timing

First Click (1)

Last Click (2)

Page Submit (3)

Click Count (4)

End of Block: aboutyou

Start of Block: knowledge

Q42

Common Knowledge? Or not so much?

Finally, we are interested in what "common knowledge" exists about $\{e://Field/plur\}$. Please indicate whether the following are True or False.

Please do not "google" the answers (we are not interested in what people can google!).

If you do not know, then please do just guess -- this will tell us what people are likely to think, even if they do not know for sure.



knw1

	True (1)	False (2)
FAA regulations state that $\{e://Field/plur\}$ must follow temporary flight restrictions around	<input type="radio"/>	<input type="radio"/>

stadiums and racetracks. (4)		
FAA regulations state that $\{e://Field/plur\}$ are prohibited from flying around stadiums and racetracks at any time. (5)	<input type="radio"/>	<input type="radio"/>



knw2

	True (1)	False (2)
Unless granted a waiver, most $\{e://Field/plur\}$ should stay below 400 feet. (4)	<input type="radio"/>	<input type="radio"/>
Unless granted a waiver, most $\{e://Field/plur\}$ should be flown above 500 feet. (5)	<input type="radio"/>	<input type="radio"/>



knw3

	True (1)	False (2)
Businesses can request exemptions from certain FAA regulations regarding the use of	<input type="radio"/>	<input type="radio"/>

<p>§{e://Field/plur}. (6)</p>		
<p>Currently, the FAA does not allow any exemptions from regulations regarding the use of §{e://Field/plur}. (7)</p>	<p style="text-align: center;"><input type="radio"/></p>	<p style="text-align: center;"><input type="radio"/></p>



knw4

	True (1)	False (2)
<p>Unless they receive a waiver, operators must keep §{e://Field/plur} in their sight. (8)</p>	<p style="text-align: center;"><input type="radio"/></p>	<p style="text-align: center;"><input type="radio"/></p>
<p>Operators are only allowed to fly §{e://Field/plur} outside of their line of sight if the §{e://Field/plur} are equipped with GPS tracking technologies. (9)</p>	<p style="text-align: center;"><input type="radio"/></p>	<p style="text-align: center;"><input type="radio"/></p>



knw5

	True (1)	False (2)
<p>The Modernization Reform Act of 2012 required the FAA to create</p>	<p style="text-align: center;"><input type="radio"/></p>	<p style="text-align: center;"><input type="radio"/></p>

rules for the use of $\{e://Field/plur\}$ in the U.S. (10)		
Most of the rules regulating use of $\{e://Field/plur\}$ in the U.S. were established by the FAA in 1995. (11)	<input type="radio"/>	<input type="radio"/>

p8time_know Timing

First Click (1)

Last Click (2)

Page Submit (3)

Click Count (4)

End of Block: knowledge

Start of Block: thxyou

comm_end

This is the end of the survey.

THANK YOU!

If you have any comments on the survey questions above, especially comments that might help us to improve this survey, please write them below.

For example, were there any unclear questions or did anything not make sense? All comments are welcome.

Q38 When you are finished, please submit your survey using the button below.

p9time_done Timing

First Click (1)

Last Click (2)

Page Submit (3)

Click Count (4)

End of Block: thxyou

Appendix B. Codebook for Hopes and Concerns

This is an appendix to the *Public Opinions of Unmanned Aerial Technologies in 2014-2019: A Technical Report published by the University of Nebraska Public Policy Center in 2020.*

Code	Description	Examples
CONCERNS		
CnAccidents	<p><u>Accidents</u> Comments that include concerns over crashes and “accidents” or that mention danger or safety</p> <p>Include property damage here</p> <p><u>Safety/Security or Danger Themes</u> Comments about airspace safety (not just air space traffic, but safety), safety for other manned flying devices, accidental deaths, injuries, etc., “dangerous”</p> <p>Usually will not be on purpose (e.g., killing people or murdering them are misuse, not safety)</p>	<p>“Mistakes and crashing”</p> <p>“Electronic malfunction that causes it to crash while no one is there to direct it”</p> <p>“That it could be dangerous depending on who is navigating it”</p> <p>“Safety when operating in the same airspace with manned aircraft”</p> <p>“Accidentally killing innocent people”</p>
CnReliability	<p><u>Reliability and Tech Malfunctions or concerns about tech/design features</u></p> <p>Concerns over drone malfunctions, lack of control of technology, possibility of tech failure, and drones not being able to carry out intended purposes under various conditions (e.g., weather)</p> <p>Limitations of technologies (even if compared to humans), e.g., noting that it is not conscious or able to make ethical decisions is a limitation</p>	<p>“The system could fail easily because even technology fails.”</p> <p>“malfunction or it may die out”</p> <p>“reliability, not being able to get to their destination”</p> <p>“control” or “loss of control”</p> <p>“technology”</p>
CnHijack	<p><u>Hijacking and Hacking</u> Comments that note concerns about hacking of the machine or hijacking.</p>	<p>“There could also be the possibility that a drone could be hacked and taken over by someone else.”</p> <p>“An aerial robot can be hijacked via hackers on the internet.”</p>
CnMisuse	<p><u>Moral Misuse</u> Comments that note potential (intentional) misuse of technology, whether it be by civilians, the military, or other government officials. Any crimes including trespassing, spying.</p>	<p>“It detaches the pilot from the consequences of his actions”</p> <p>“That someone can do something bad with them and is not easy to trace them back”</p> <p>“Drones used overseas for war and distribution of drugs and weapons”</p> <p>“security”</p>
CnPrivacy	<p><u>Privacy</u> Comments that note concerns about privacy or people (or the government) spying on them (note that spying also assumes misuse—specifically misuse related to privacy)</p>	<p>“Government invasion of privacy”</p> <p>“For one, nobody likes the idea of being observed by a drone through their window.”</p>
CnEcon	<p><u>Economic</u> Comments that refer to economic concerns (i.e. job loss, costs, impact on companies, etc.) and issues of efficiency</p>	<p>“Delivery job loss”</p> <p>“What will happen to human pilots?”</p> <p>“cost of drones.”</p>

Code	Description	Examples
CnPilot/auto	<p><u>Pilot and Autonomy</u> Concerns over who or what's operating or controlling the drones (or not operating it if autonomous), drone autonomy, and fallible human element of drone operation (including carelessness fallibility of the pilot)</p> <p>Also, autonomy of the UAS relating to evolving, taking control of itself, taking over the world</p>	<p>"No pilot"</p> <p>"without a human"</p> <p>"I don't like that there isn't a pilot to be there to adjust for weather conditions etc."</p> <p>"That it could be dangerous depending on who is navigating it"</p> <p>"the pilot on the ground lose control of the UAV"</p> <p>"the wrong hands controlling it"</p>
CnAirTraf	<p><u>Air Traffic</u> Concerns over air traffic problems such as flight interferences, air craft coordination, regulations, infrastructure (ie. power lines) etc.</p>	<p>"potential for entering into aviation flight paths"</p> <p>"tangling in power lines and getting in the way of planes"</p>
CnDontK	<p><u>Don't Know</u> Participants that respond they do not know what concerns them regarding drones</p>	<p>"Not sure"</p> <p>"I don't know enough to form an opinion."</p>
CnNo	<p><u>No Concerns</u> Comments that say they have no concerns or do not answer the question</p>	<p>"no concerns"</p> <p>"none"</p> <p>"n/a"</p>
CnOther	<p><u>Other</u> Comments that do not otherwise fit in any category</p>	<p>Regulations (not airspace) or too general to categorize</p> <p>Nuisance stuff</p>
HOPES		
HpLawMil	<p><u>Law Enforcement and Military Uses</u> Comments that note different uses available to law enforcement and/or the military (i.e., security, boarder control, preventing or stopping crime and terrorism, combat, war, bombs, spying, etc.)</p> <p>War, crime, security, spying.</p>	<p>"They can prevent or lessen the harm of crime to others."</p> <p>"Dropping bombs, spying for information"</p> <p>"Hunting down the enemy of the military"</p> <p>"Security"</p>
HpEmerMed	<p>The 'do good' part of military activities, or could be enacted by NGOs or hospitals, or police. This includes references to disaster related responses.</p>	<p>"help in search and rescues"</p> <p>Finding missing people</p> <p>"delivering medical supplies and water"</p> <p>Disaster relief</p> <p>Surveying damage from disasters (also mark under service, b/c could be for example done by insurance companies)</p>
HpEnvRes	<p><u>Environmental and Research Uses</u> Comments that note potential environmental or research uses (i.e. natural resources, weather, space, etc.)</p>	<p>"Better understanding of what causes severe weather with less risk to human life"</p> <p>"Surveying" and "mapping" note: also code on service.</p> <p>"Observing forest fires" or the weather, or a natural disaster.</p> <p>Include Outer space travel</p>

Code	Description	Examples
HpService	<p><u>Services</u> Comments that note services can be provided, such as deliveries or better photography. Not always commercial service, could be good will or mission trips.</p> <p><u>Economic Benefits</u> Comments that note the economic benefits that may result from this technology (i.e. better efficiency, save money, etc.)</p> <p>Often technological abilities (fly a long time, aerial photos) fit here; also getting to hard to reach places</p> <p>Also things like “faster,” “easier,” “more efficient”, “helpful” and general things like increasing innovation/technology: Innovation! better technology understanding. Moving into the computerized future</p>	<p>“They can possibly bring items to invalids on short notice.”</p> <p>“Deliveries, at 2:30 am!”</p> <p>“Photography will improve.”</p> <p>“Can’t think of any other than cost reduction”</p> <p>“It is probably cheaper in the long run.”</p> <p>“less labor”</p> <p>“From a commercial perspective, quicker and more efficient delivery mechanism...”</p> <p>“surveying” note: also code on environmental and research uses.</p> <p>“getting to places you otherwise cannot get to”</p>
HpSafe	<p><u>Safety Features</u> Comments that note improved safety conditions (i.e. less risk to pilot, fewer deaths, etc.)</p> <p>and getting into dangerous places</p>	<p>“Less soldiers have to die with UASs.”</p> <p>“Good for spy missions and not risking human life.”</p>
HpControl	<p><u>Control</u> Comments that note better control due to this technology (i.e. less human error, fewer accidents)</p> <p>Paralleling the concern category: hopes that relate to who or what’s operating or controlling the drones (or not operating it if autonomous), drone autonomy, and fallible human element of drone operation.</p>	<p>“There might be less human error.”</p> <p>“Reduces pilot error”</p> <p>“You can control them wherever you are”</p> <p>“Its flight is controlled”</p>
HpFun/rec	<p><u>Fun and Recreation</u> Comments that note participants are hopeful for recreational use of drones, and the entertainment they could provide to such hobbyists</p>	<p>“being able to have fun”</p> <p>“is fun”</p> <p>“probably like to play with them”</p>
HpNo-Neg	<p><u>No Hopes</u> Comments that either say that they have no hopes or do not approve of drone usage (or some other derivative) and those that do not answer the question</p> <p><u>Negative Hopes (concerns)</u> If they “hope” their concerns don’t come true.</p>	<p>“There is no benefit.”</p> <p>“Nothing”</p> <p>“I hope that Americans decry the use of aerial robots.”</p> <p>“I hope that they don’t kill us all.”</p> <p>“that it does not happen in my life time”</p>
HpDontK	<p><u>Don’t Know</u> Participants that respond they do not know what hopes they have regarding drones</p>	<p>“Don’t know”</p> <p>“Not sure”</p> <p>“I have no clue. I don’t know anything about them</p>
HpOther	<p><u>Other</u> Comments or parts of comments that do not otherwise fit in any category</p>	

Appendix C

This is an appendix to the *Public Opinions of Unmanned Aerial Technologies in 2014-2019: A Technical Report* published by the University of Nebraska Public Policy Center in 2020.

Table C1. Correlations between Experimental Conditions and Demographic and Initial Attitudes Variables

Note: Some of the significant correlations may arise due to changes across samples (e.g., Qualtrics samples are older, and the weather science condition only occurred in the Qualtrics sample).

		drone_c ond	UAS_c ond	UAV_c ond	AR_c ond	Actor public=0; private=1	sec_co nd	envir_c ond	econ_c ond	sci_co nd	auto_c ond	manu_c ond	mixc_c ond	Goal 0=prev 1=promo
What is your gender? 0=male 1=female	Pearson Correlation	.004	-.010	-.007	.013	-.022	-.010	-.005	.014	.002	.013	-.008	-.006	-.014
	Sig. (2-tailed)	.751	.404	.538	.272	.065	.387	.657	.223	.835	.254	.521	.618	.236
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
What is your age?	Pearson Correlation	-.026	.007	.008	.011	-.003	-.002	-.001	-.023	.056	-.014	.008	.005	-.003
	Sig. (2-tailed)	.027	.541	.486	.342	.806	.861	.936	.054	.000	.244	.478	.649	.769
	N	7258	7258	7258	7258	7258	7258	7258	7258	7258	7258	7258	7258	7258
identifies as white	Pearson Correlation	-.004	.000	.007	-.003	.016	-.004	-.005	.021	-.028	.010	.018	-.028	-.001
	Sig. (2-tailed)	.730	.980	.531	.768	.179	.735	.689	.067	.017	.398	.124	.017	.964
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262

		drone_c	UAS_c	UAV_c	AR_c	Actor	sec_co	envir_c	econ_c	sci_co	auto_c	manu_c	mixc_c	Goal
		ond	ond	ond	ond	public=0; private=1	nd	ond	ond	nd	ond	ond	ond	0=prev 1=promo
identifies as a minority	Pearson Correlation	.013	-.004	-.021	.011	-.011	-.003	.004	-.010	.018	.003	-.025	.022	-.008
	Sig. (2-tailed)	.265	.740	.080	.354	.356	.821	.726	.417	.131	.798	.030	.057	.503
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
identifies as hispanic	Pearson Correlation	.021	.004	-.036	.010	-.002	-.009	.001	.003	.011	.025	-.018	-.007	-.016
	Sig. (2-tailed)	.073	.737	.002	.374	.871	.468	.946	.810	.360	.034	.125	.558	.169
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
identifies as black	Pearson Correlation	-.004	-.001	-.001	.005	-.025	.004	.014	-.028	.021	-.011	-.021	.031	.009
	Sig. (2-tailed)	.728	.946	.961	.642	.036	.730	.239	.018	.070	.371	.074	.007	.420
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
identifies as native hawaiian or PI	Pearson Correlation	.010	-.007	.007	-.010	-.014	-.003	.002	.002	-.003	.014	-.009	-.005	-.012
	Sig. (2-tailed)	.404	.546	.551	.398	.222	.820	.895	.837	.807	.223	.419	.681	.309
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
identifies as asian	Pearson Correlation	.015	-.016	.001	.000	.024	.002	-.011	.010	-.001	-.018	.017	.000	-.005
	Sig. (2-tailed)	.198	.160	.958	.987	.038	.894	.358	.409	.937	.131	.137	.980	.675
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
identifies as amer indian or alaska native	Pearson Correlation	-.007	-.012	.005	.014	.005	-.003	.000	.004	-.003	.011	-.010	-.001	.010
	Sig. (2-tailed)	.527	.308	.688	.218	.648	.787	.991	.713	.812	.368	.405	.944	.414
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262

		drone_c ond	UAS_c ond	UAV_c ond	AR_c ond	Actor public=0; private=1	sec_co nd	envir_c ond	econ_c ond	sci_co nd	auto_c ond	manu_c ond	mixc_c ond	Goal 0=prev 1=promo
Are you a certified or commercial pilot? 0no 1yes	Pearson Correlation	-.003	-.006	-.003	.011	-.003	.011	.012	-.026	.005	-.008	-.002	.010	-.007
	Sig. (2-tailed)	.793	.660	.833	.369	.819	.369	.321	.037	.716	.506	.884	.417	.590
	N	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385
ave ideology across overall economic and social, high = conservative	Pearson Correlation	-.012	-.016	.028	.000	.008	-.009	-.007	.001	.034	-.001	-.001	.002	-.005
	Sig. (2-tailed)	.293	.182	.015	.969	.513	.426	.532	.923	.004	.942	.950	.892	.643
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
A1: Political ideology-Overall	Pearson Correlation	-.009	-.017	.028	-.003	.006	-.009	-.008	.002	.033	.001	.001	-.001	-.006
	Sig. (2-tailed)	.458	.152	.016	.800	.624	.453	.494	.888	.004	.959	.945	.905	.580
	N	7261	7261	7261	7261	7261	7261	7261	7261	7261	7261	7261	7261	7261
A1: Political ideology-When it comes to ECONOMIC issues	Pearson Correlation	-.013	-.017	.030	.001	.013	-.007	-.002	.000	.020	.003	.000	-.003	-.002
	Sig. (2-tailed)	.254	.147	.012	.950	.266	.541	.847	.987	.082	.802	.977	.824	.864
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
A1: Political ideology-When it comes to SOCIAL issues	Pearson Correlation	-.012	-.010	.022	.001	.003	-.010	-.010	.001	.041	-.006	-.002	.008	-.007
	Sig. (2-tailed)	.294	.386	.065	.941	.807	.393	.390	.908	.000	.629	.836	.490	.572
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
In politics today do you consider yourself a	Pearson Correlation	-.016	-.008	.021	.002	-.002	-.011	.009	-.006	.017	-.019	.021	-.002	-.026
	Sig. (2-tailed)	.180	.499	.067	.842	.893	.348	.423	.603	.151	.103	.074	.878	.026

		drone_c ond	UAS_c ond	UAV_c ond	AR_c ond	Actor public=0; private=1	sec_co nd	envir_c ond	econ_c ond	sci_co nd	auto_c ond	manu_c ond	mixc_c ond	Goal 0=prev 1=promo
Republican, Democrat, or Independent/other?	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
I believe protection of our environmental resources should be the nation's top priority.	Pearson Correlation	-.019	.006	.000	.013	-.003	-.017	.010	-.009	.036	.004	-.004	.000	.013
	Sig. (2-tailed)	.113	.620	.979	.275	.798	.141	.413	.452	.002	.762	.753	.991	.267
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
I believe U.S. national security should be the nation's top priority.	Pearson Correlation	-.002	.014	-.002	-.010	.011	-.018	-.009	.009	.039	.018	-.002	-.016	-.004
	Sig. (2-tailed)	.854	.232	.882	.408	.359	.134	.449	.463	.001	.118	.854	.168	.757
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
I believe that a strong U.S. economy should be the nation's top priority.	Pearson Correlation	.011	-.003	.000	-.008	.000	-.009	.007	-.004	.013	.011	-.002	-.009	-.018
	Sig. (2-tailed)	.341	.785	.969	.511	.972	.426	.550	.746	.254	.357	.889	.434	.120
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
I believe addressing climate change	Pearson Correlation	-.020	-.012	-.010	.042	.030	-.042	.022	.000	.020	-.021	-.013	.034	.016
	Sig. (2-tailed)	.462	.655	.718	.133	.278	.128	.424	.993	.471	.445	.647	.223	.570

		drone_c ond	UAS_c ond	UAV_c ond	AR_c ond	Actor public=0; private=1	sec_co nd	envir_c ond	econ_c ond	sci_co nd	auto_c ond	manu_c ond	mixc_c ond	Goal 0=prev 1=promo
should be the nation's top priority.	N	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
I believe advancing science should be the nation's top priority.	Pearson Correlation	-.024	.002	-.003	.024	.007	-.045	.029	-.024	.040	-.015	.013	.002	-.032
	Sig. (2-tailed)	.397	.944	.906	.378	.802	.101	.295	.385	.152	.594	.648	.938	.253
prev0pro1	N	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
	Pearson Correlation	.033	-.031	-.015	.013	.002	-.007	-.021	.003	.061	.011	-.016	.006	-.013
	Sig. (2-tailed)	.202	.231	.560	.603	.951	.791	.406	.894	.016	.670	.522	.829	.612
	N	1527	1527	1527	1527	1527	1527	1527	1527	1527	1527	1527	1527	1527
promotion focused disposition	Pearson Correlation	.011	-.018	.004	.002	-.012	-.007	-.004	-.012	.047	.012	-.011	-.002	-.003
	Sig. (2-tailed)	.343	.130	.714	.879	.313	.578	.765	.325	.000	.292	.367	.879	.795
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262
prevention focused disposition	Pearson Correlation	.004	-.014	.017	-.007	.004	-.014	.008	-.013	.043	.003	-.001	-.002	.008
	Sig. (2-tailed)	.754	.247	.155	.550	.748	.222	.492	.261	.000	.824	.958	.865	.492
	N	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262	7262

Note: The following correlations may have been impacted by the use of certain terminology rather than use of other terminology, as these variables were assessed after giving the participants information about the named technologies.

		drone_c	UAS_c	UAV_c	AR_c	Actor	sec_co	envir_c	econ_c	sci_co	auto_c	manu_c	mixc_c	Goal
		ond	ond	ond	ond	public=0; private=1	nd	ond	ond	nd	ond	ond	ond	0=prev 1=promo
genatt_safe	Pearson	.099	-.057	-.063	.017	.018	-.044	.043	-.022	.023	-.034	.007	.027	-.031
	Correlation													
	Sig. (2-tailed)	.000	.041	.023	.547	.527	.110	.122	.420	.401	.220	.791	.337	.270
N		1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
genatt_annoy	Pearson	-.045	-.029	.031	.043	.004	.026	.005	.000	-.031	.003	.018	-.021	-.020
	Correlation													
	Sig. (2-tailed)	.105	.293	.265	.118	.886	.340	.869	.994	.267	.902	.515	.440	.474
N		1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
genatt_benefit	Pearson	.111	-.042	-.079	.006	-.013	-.014	-.010	-.008	.031	-.032	-.009	.042	.005
	Correlation													
	Sig. (2-tailed)	.000	.129	.004	.837	.632	.621	.707	.787	.264	.243	.737	.133	.847
N		1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
genatt_harm	Pearson	-.150	.061	.017	.074	.038	.030	.025	-.026	-.029	-.003	.010	-.007	.004
	Correlation													
	Sig. (2-tailed)	.000	.029	.546	.007	.169	.274	.375	.345	.302	.927	.730	.800	.878
N		1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
genatt_allpos	Pearson	.118	-.039	-.060	-.022	-.012	-.030	-.002	-.002	.033	-.022	-.009	.031	-.001
	Correlation													
	Sig. (2-tailed)	.000	.161	.031	.419	.661	.286	.942	.947	.235	.432	.745	.268	.975
N		1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
average subjective knowledge about regulations, uses, capabilities	Pearson	.135	-.061	-.032	-.045	-.009	-.001	-.017	-.005	.046	.005	-.004	-.001	.007
	Correlation													
	Sig. (2-tailed)	.000	.000	.011	.000	.494	.960	.178	.718	.000	.718	.765	.950	.585
N		6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385

		drone_c	UAS_c	UAV_c	AR_c	Actor	sec_co	envir_c	econ_c	sci_co	auto_c	manu_c	mixc_c	Goal
		ond	ond	ond	ond	public=0; private=1	nd	ond	ond	nd	ond	ond	ond	0=prev 1=promo
subj knowledge in 2019 with extra item	Pearson Correlation	.132	-.060	-.032	-.044	-.009	-.002	-.015	-.006	.047	.006	-.004	-.002	.006
	Sig. (2-tailed)	.000	.000	.011	.000	.450	.903	.219	.637	.000	.642	.733	.901	.613
	N	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385
objknw	Pearson Correlation	.040	-.023	-.010	-.008	.016	.005	-.005	.013	-.027	.000	-.007	.007	.002
	Sig. (2-tailed)	.001	.066	.431	.515	.189	.707	.699	.291	.032	.991	.582	.590	.860
	N	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385
objknwwt	Pearson Correlation	.037	-.022	-.020	.005	.017	.013	-.006	.007	-.029	.006	-.005	-.001	-.002
	Sig. (2-tailed)	.003	.077	.103	.710	.169	.291	.614	.568	.021	.653	.690	.959	.875
	N	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385	6385

Table C2. Correlations between Demographics and the Primary Dependent Variables (Overall Data)

		average support and approval for technology	overall trust in actor	overall trust in regulators	full scale trust no distrust in UATs
What is your gender? 0=male 1=female	Pearson Correlation	-.068	-.031	-.015	-.042
	Sig. (2-tailed)	.000	.008	.231	.001
	N	7262	7262	6385	6385
What is your age?	Pearson Correlation	.009	.061	.013	-.013
	Sig. (2-tailed)	.450	.000	.295	.295
	N	7258	7258	6381	6381
identifies as white	Pearson Correlation	-.021	-.037	-.018	-.037
	Sig. (2-tailed)	.069	.002	.145	.003
	N	7262	7262	6385	6385
identifies as a minority	Pearson Correlation	.021	.036	.017	.043
	Sig. (2-tailed)	.072	.002	.165	.001
	N	7262	7262	6385	6385
identifies as hispanic	Pearson Correlation	.004	.013	-.007	.022
	Sig. (2-tailed)	.728	.272	.558	.075
	N	7262	7262	6385	6385
identifies as black	Pearson Correlation	-.006	.010	.002	.017
	Sig. (2-tailed)	.626	.406	.865	.181
	N	7262	7262	6385	6385
identifies as native hawaiiin or PI	Pearson Correlation	-.005	.020	.015	.008
	Sig. (2-tailed)	.675	.086	.235	.517
	N	7262	7262	6385	6385
identifies as asian	Pearson Correlation	.040	.037	.035	.015

		average support and approval for technology	overall trust in actor	overall trust in regulators	full scale trust no distrust in UATs
	Sig. (2-tailed)	.001	.002	.005	.218
	N	7262	7262	6385	6385
identifies as amer indian or alaska native	Pearson Correlation	-.001	.002	-.016	.000
	Sig. (2-tailed)	.947	.862	.212	.988
	N	7262	7262	6385	6385
identifies as other	Pearson Correlation	-.025	-.013	-.025	-.013
	Sig. (2-tailed)	.033	.257	.046	.317
	N	7262	7262	6385	6385
Are you a certified or commercial pilot? 0no 1yes	Pearson Correlation	.046	.008	.015	.015
	Sig. (2-tailed)	.000	.531	.227	.237
	N	6385	6385	6385	6385
ave ideology across overall economic and social, high = conservative	Pearson Correlation	.002	.010	-.037	-.007
	Sig. (2-tailed)	.879	.373	.003	.576
	N	7262	7262	6385	6385
A1: Political ideology-Overall	Pearson Correlation	-.001	.006	-.040	-.010
	Sig. (2-tailed)	.950	.628	.001	.439
	N	7261	7261	6385	6385
A1: Political ideology-When it comes to ECONOMIC issues	Pearson Correlation	.002	-.004	-.037	-.014
	Sig. (2-tailed)	.833	.760	.003	.250
	N	7262	7262	6385	6385
A1: Political ideology-When it comes to SOCIAL issues	Pearson Correlation	.003	.026	-.028	.004
	Sig. (2-tailed)	.789	.025	.024	.755
	N	7262	7262	6385	6385
	Pearson Correlation	.005	-.014	-.046	-.015

		average support and approval for technology	overall trust in actor	overall trust in regulators	full scale trust no distrust in UATs
In politics today do you consider yourself a Republican, Democrat, or Independent/other?	Sig. (2-tailed)	.660	.245	.000	.234
	N	7262	7262	6385	6385

Table C3. Demographics correlated with Support for the technologies, by sample and overall

	support	mturk 2014	mturk 2015	mturk 2016	qualtrics 2016	qualtrics 2017	qualtrics 2019	All
What is your gender? 0=male 1=female	Pearson Correlation	-0.026	-0.017	-0.040	-0.057	-0.071	-0.158	-.068
	Sig. (2-tailed)	0.532	0.762	0.075	0.010	0.022	0.000	.000
	N	576	301	1946	2089	1050	1300	7262
What is your age?	Pearson Correlation	-0.005	-0.075	0.005	-0.008	0.006	0.062	.009
	Sig. (2-tailed)	0.913	0.191	0.842	0.709	0.841	0.026	.450
	N	576	301	1945	2087	1049	1300	7258
identifies as white	Pearson Correlation	-0.008	-0.001	0.004	-0.038	-0.015	-0.040	-.021
	Sig. (2-tailed)	0.853	0.989	0.847	0.083	0.625	0.155	.069
	N	576	301	1946	2089	1050	1300	7262
identifies as a minority	Pearson Correlation	0.024	-0.049	-0.002	0.032	0.029	0.057	.021
	Sig. (2-tailed)	0.566	0.395	0.929	0.149	0.355	0.041	.072
	N	576	301	1946	2089	1050	1300	7262
identifies as hispanic	Pearson Correlation	0.011	-0.051	0.003	0.002	0.001	0.041	.004
	Sig. (2-tailed)	0.794	0.374	0.894	0.938	0.970	0.139	.728
	N	576	301	1946	2089	1050	1300	7262
identifies as black	Pearson Correlation	0.001	-0.125	-0.014	0.025	-0.012	-0.015	-.006

	Sig. (2-tailed)	0.980	0.030	0.542	0.263	0.703	0.589	.626
	N	576	301	1946	2089	1050	1300	7262
identifies as native hawaiiin or PI	Pearson Correlation	0.054	0.071	-0.020	-0.033	0.011	-0.007	-.005
	Sig. (2-tailed)	0.192	0.221	0.385	0.133	0.711	0.798	.675
	N	576	301	1946	2089	1050	1300	7262
identifies as asian	Pearson Correlation	0.001	0.089	0.012	0.025	0.068	0.092	.040
	Sig. (2-tailed)	0.980	0.121	0.608	0.247	0.028	0.001	.001
	N	576	301	1946	2089	1050	1300	7262
identifies as amer indian or alaska native	Pearson Correlation	-0.022	-0.007	-0.008	0.016	-0.007	0.014	-.001
	Sig. (2-tailed)	0.606	0.904	0.709	0.456	0.810	0.611	.947
	N	576	301	1946	2089	1050	1300	7262
identifies as other	Pearson Correlation	. ^a	. ^a	-0.022	-0.033	-0.016	-0.042	-.025
	Sig. (2-tailed)			0.333	0.129	0.597	0.130	.033
	N	576	301	1946	2089	1050	1300	7262
Are you a certified or commercial pilot? 0no 1yes	Pearson Correlation	. ^a	. ^a	-0.006	0.063	0.048	0.081	.046
	Sig. (2-tailed)			0.802	0.004	0.119	0.004	.000
	N	0	0	1946	2089	1050	1300	6385
ave ideology across overall economic and social, high = conservative	Pearson Correlation	-0.052	0.065	0.011	-0.009	0.073	-0.046	.002
	Sig. (2-tailed)	0.214	0.262	0.633	0.682	0.018	0.096	.879
	N	576	301	1946	2089	1050	1300	7262
A1: Political ideology-Overall	Pearson Correlation	-0.047	0.062	0.006	-0.008	0.054	-0.042	-.001
	Sig. (2-tailed)	0.258	0.286	0.790	0.720	0.078	0.133	.950
	N	575	301	1946	2089	1050	1300	7261
A1: Political ideology-When it comes to ECONOMIC issues	Pearson Correlation	-0.066	0.070	0.032	-0.034	0.083	-0.041	.002
	Sig. (2-tailed)	0.116	0.229	0.161	0.119	0.007	0.144	.833
	N	576	301	1946	2089	1050	1300	7262
A1: Political ideology-When it comes to SOCIAL issues	Pearson Correlation	-0.032	0.048	-0.008	0.015	0.067	-0.048	.003

	Sig. (2-tailed)	0.448	0.406	0.720	0.479	0.030	0.082	.789
	N	576	301	1946	2089	1050	1300	7262
In politics today do you consider yourself a Republican, Democrat, or Independent/other?	Pearson Correlation	-0.037	0.067	0.023	-0.034	0.107	-0.049	.005
	Sig. (2-tailed)	0.381	0.248	0.309	0.121	0.001	0.079	.660
	N	576	301	1946	2089	1050	1300	7262

Table C4. Demographics correlated with Trust in the technologies, by sample and overall

Trust UATs		mturk	qualtrics	qualtrics	qualtrics	overall
		2016	2016	2017	2019	
What is your gender? 0=male 1=female	Pearson Correlation	-0.041	-0.023	-0.038	-0.072	-.042
	Sig. (2-tailed)	0.070	0.290	0.220	0.009	.001
	N	1946	2089	1050	1300	6385
What is your age?	Pearson Correlation	-0.050	-0.053	-0.003	0.021	-.013
	Sig. (2-tailed)	0.028	0.015	0.915	0.452	.295
	N	1945	2087	1049	1300	6381
identifies as white	Pearson Correlation	-0.038	-0.048	-0.037	-0.004	-.037
	Sig. (2-tailed)	0.096	0.027	0.237	0.878	.003
	N	1946	2089	1050	1300	6385
identifies as a minority	Pearson Correlation	0.039	0.055	0.053	0.011	.043
	Sig. (2-tailed)	0.085	0.012	0.088	0.701	.001
	N	1946	2089	1050	1300	6385
identifies as hispanic	Pearson Correlation	0.012	0.042	0.006	0.006	.022
	Sig. (2-tailed)	0.602	0.056	0.842	0.829	.075
	N	1946	2089	1050	1300	6385
identifies as black	Pearson Correlation	0.017	0.027	-0.009	0.010	.017
	Sig. (2-tailed)	0.466	0.215	0.771	0.714	.181

	N	1946	2089	1050	1300	6385
identifies as native hawaii or PI	Pearson Correlation	-0.005	0.007	0.019	0.017	.008
	Sig. (2-tailed)	0.829	0.762	0.549	0.551	.517
	N	1946	2089	1050	1300	6385
identifies as asian	Pearson Correlation	0.027	-0.025	0.076	0.014	.015
	Sig. (2-tailed)	0.232	0.251	0.014	0.624	.218
	N	1946	2089	1050	1300	6385
identifies as amer indian or alaska native	Pearson Correlation	0.016	0.006	-0.006	-0.023	.000
	Sig. (2-tailed)	0.469	0.773	0.844	0.417	.988
	N	1946	2089	1050	1300	6385
identifies as other	Pearson Correlation	0.002	-0.021	-0.005	-0.030	-.013
	Sig. (2-tailed)	0.914	0.328	0.882	0.276	.317
	N	1946	2089	1050	1300	6385
Are you a certified or commercial pilot? 0no 1yes	Pearson Correlation	-0.014	0.001	0.017	0.061	.015
	Sig. (2-tailed)	0.546	0.949	0.587	0.029	.237
	N	1946	2089	1050	1300	6385
ave ideology across overall economic and social, high = conservative	Pearson Correlation	-0.026	-0.044	0.063	-0.008	-.007
	Sig. (2-tailed)	0.250	0.047	0.042	0.775	.576
	N	1946	2089	1050	1300	6385
A1: Political ideology-Overall	Pearson Correlation	-0.023	-0.045	0.051	-0.011	-.010
	Sig. (2-tailed)	0.311	0.041	0.097	0.704	.439
	N	1946	2089	1050	1300	6385
A1: Political ideology-When it comes to ECONOMIC issues	Pearson Correlation	-0.022	-0.053	0.065	-0.022	-.014
	Sig. (2-tailed)	0.330	0.015	0.036	0.433	.250
	N	1946	2089	1050	1300	6385
A1: Political ideology-When it comes to SOCIAL issues	Pearson Correlation	-0.027	-0.025	0.061	0.009	.004
	Sig. (2-tailed)	0.232	0.262	0.049	0.745	.755

	N	1946	2089	1050	1300	6385
In politics today do you consider yourself a Republican, Democrat, or Independent/other?	Pearson Correlation	-0.027	-0.071	0.070	-0.009	-.015
	Sig. (2-tailed)	0.242	0.001	0.022	0.754	.234
	N	1946	2089	1050	1300	6385

Table C5. Demographics correlated with trust in actor using the technologies, by sample and overall

trust in actor		mturk	mturk	mturk	qualtrics	qualtrics	qualtrics	overall
		2014	2015	2016	2016	2017	2019	
What is your gender? 0=male 1=female	Pearson Correlation	-0.029	-0.037	-0.002	-0.054	-0.009	-0.057	-.031
	Sig. (2-tailed)	0.492	0.519	0.931	0.013	0.767	0.039	.008
	N	576	301	1946	2089	1050	1300	7262
What is your age?	Pearson Correlation	0.009	-0.021	0.044	-0.005	0.026	0.138	.061
	Sig. (2-tailed)	0.834	0.720	0.054	0.811	0.396	0.000	.000
	N	576	301	1945	2087	1049	1300	7258
identifies as white	Pearson Correlation	-0.009	-0.073	-0.004	-0.049	-0.063	0.009	-.037
	Sig. (2-tailed)	0.837	0.208	0.860	0.026	0.043	0.734	.002
	N	576	301	1946	2089	1050	1300	7262
identifies as a minority	Pearson Correlation	0.088	0.017	0.017	0.040	0.044	-0.016	.036
	Sig. (2-tailed)	0.034	0.775	0.455	0.065	0.157	0.575	.002
	N	576	301	1946	2089	1050	1300	7262
identifies as hispanic	Pearson Correlation	0.131	0.001	0.006	0.013	-0.018	-0.037	.013
	Sig. (2-tailed)	0.002	0.984	0.800	0.540	0.555	0.187	.272
	N	576	301	1946	2089	1050	1300	7262

identifies as black	Pearson Correlation	-0.001	-0.040	-0.019	0.029	0.002	0.006	.010
	Sig. (2-tailed)	0.983	0.489	0.396	0.181	0.952	0.817	.406
	N	576	301	1946	2089	1050	1300	7262
identifies as native hawaiiin or PI	Pearson Correlation	0.103	0.031	0.014	0.000	0.044	0.001	.020
	Sig. (2-tailed)	0.013	0.591	0.549	0.987	0.157	0.962	.086
	N	576	301	1946	2089	1050	1300	7262
identifies as asian	Pearson Correlation	0.045	0.076	0.022	0.025	0.082	0.040	.037
	Sig. (2-tailed)	0.284	0.187	0.323	0.261	0.008	0.146	.002
	N	576	301	1946	2089	1050	1300	7262
identifies as amer indian or alaska native	Pearson Correlation	0.033	-0.034	0.012	-0.016	0.016	-0.012	.002
	Sig. (2-tailed)	0.429	0.561	0.608	0.477	0.613	0.662	.862
	N	576	301	1946	2089	1050	1300	7262
identifies as other	Pearson Correlation	.a	.a	-0.031	-0.017	0.037	-0.046	-.013
	Sig. (2-tailed)			0.170	0.435	0.232	0.097	.257
	N	576	301	1946	2089	1050	1300	7262
Are you a certified or commercial pilot? 0no 1yes	Pearson Correlation	.a	.a	0.010	-0.010	-0.005	0.046	.008
	Sig. (2-tailed)			0.647	0.651	0.866	0.096	.531
	N	0	0	1946	2089	1050	1300	6385
ave ideology across overall economic and social, high = conservative	Pearson Correlation	-0.042	0.061	0.012	-0.043	0.042	0.018	.010
	Sig. (2-tailed)	0.311	0.295	0.590	0.048	0.179	0.527	.373
	N	576	301	1946	2089	1050	1300	7262
A1: Political ideology-Overall	Pearson Correlation	-0.048	0.052	0.011	-0.045	0.038	0.008	.006
	Sig. (2-tailed)	0.255	0.370	0.617	0.041	0.224	0.782	.628
	N	575	301	1946	2089	1050	1300	7261
A1: Political ideology-When it comes to ECONOMIC issues	Pearson Correlation	-0.062	0.059	0.017	-0.066	0.021	0.013	-.004

	Sig. (2-tailed)	0.140	0.306	0.459	0.003	0.505	0.632	.760
	N	576	301	1946	2089	1050	1300	7262
A1: Political ideology-When it comes to SOCIAL issues	Pearson Correlation	-0.009	0.056	0.006	-0.012	0.057	0.028	.026
	Sig. (2-tailed)	0.820	0.330	0.804	0.581	0.063	0.310	.025
	N	576	301	1946	2089	1050	1300	7262
In politics today do you consider yourself a Republican, Democrat, or Independent/other?	Pearson Correlation	-0.051	-0.017	-0.004	-0.079	0.043	0.004	-.014
	Sig. (2-tailed)	0.224	0.773	0.871	0.000	0.160	0.876	.245
	N	576	301	1946	2089	1050	1300	7262

Table C6. Demographics correlated with Trust in the regulators of the technologies, by sample and overall

overall trust in regulators			mturk	qualtrics	qualtrics	qualtrics	overall
			2016	2016	2017	2019	
2016 mturk	What is your gender? 0=male 1=female	Pearson Correlation	-0.001	-0.024	0.007	-0.040	-.015
		Sig. (2-tailed)	0.965	0.276	0.812	0.154	.231
		N	1946	2089	1050	1300	6385
	What is your age?	Pearson Correlation	0.017	-0.009	0.017	0.076	.013
		Sig. (2-tailed)	0.442	0.678	0.577	0.006	.295
		N	1945	2087	1049	1300	6381
	identifies as white	Pearson Correlation	-0.012	-0.030	-0.039	-0.002	-.018
		Sig. (2-tailed)	0.589	0.168	0.211	0.933	.145
		N	1946	2089	1050	1300	6385
	identifies as a minority	Pearson Correlation	0.017	0.038	0.046	-0.004	.017
		Sig. (2-tailed)	0.445	0.083	0.135	0.881	.165
		N	1946	2089	1050	1300	6385

identifies as hispanic	Pearson Correlation	-0.001	0.016	-0.004	-0.011	-.007
	Sig. (2-tailed)	0.978	0.453	0.897	0.681	.558
	N	1946	2089	1050	1300	6385
identifies as black	Pearson Correlation	0.001	0.020	-0.010	-0.007	.002
	Sig. (2-tailed)	0.981	0.366	0.755	0.807	.865
	N	1946	2089	1050	1300	6385
identifies as native hawaiiin or PI	Pearson Correlation	-0.002	0.001	0.058	0.028	.015
	Sig. (2-tailed)	0.916	0.953	0.058	0.307	.235
	N	1946	2089	1050	1300	6385
identifies as asian	Pearson Correlation	0.040	0.006	0.086	0.023	.035
	Sig. (2-tailed)	0.074	0.797	0.005	0.417	.005
	N	1946	2089	1050	1300	6385
identifies as amer indian or alaska native	Pearson Correlation	-0.048	0.002	-0.008	-0.005	-.016
	Sig. (2-tailed)	0.034	0.939	0.794	0.868	.212
	N	1946	2089	1050	1300	6385
identifies as other	Pearson Correlation	-0.030	-0.039	0.008	-0.036	-.025
	Sig. (2-tailed)	0.192	0.074	0.799	0.189	.046
	N	1946	2089	1050	1300	6385
Are you a certified or commercial pilot? 0no 1yes	Pearson Correlation	0.009	0.010	0.008	0.052	.015
	Sig. (2-tailed)	0.704	0.659	0.794	0.061	.227
	N	1946	2089	1050	1300	6385
ave ideology across overall economic and social, high = conservative	Pearson Correlation	-0.069	-0.057	0.036	-0.007	-.037
	Sig. (2-tailed)	0.002	0.009	0.243	0.793	.003
	N	1946	2089	1050	1300	6385
A1: Political ideology-Overall	Pearson Correlation	-0.065	-0.060	0.022	-0.009	-.040
	Sig. (2-tailed)	0.004	0.006	0.470	0.735	.001

	N	1946	2089	1050	1300	6385
A1: Political ideology-When it comes to ECONOMIC issues	Pearson Correlation	-0.054	-0.061	0.030	-0.013	-.037
	Sig. (2-tailed)	0.017	0.005	0.331	0.631	.003
	N	1946	2089	1050	1300	6385
A1: Political ideology-When it comes to SOCIAL issues	Pearson Correlation	-0.070	-0.039	0.048	0.002	-.028
	Sig. (2-tailed)	0.002	0.078	0.119	0.953	.024
	N	1946	2089	1050	1300	6385
In politics today do you consider yourself a Republican, Democrat, or Independent/other?	Pearson Correlation	-0.077	-0.102	0.042	-0.008	-.046
	Sig. (2-tailed)	0.001	0.000	0.179	0.764	.000
	N	1946	2089	1050	1300	6385

Table C7. Robustness Check of Relationship between Gender and Support in 2019, across experimental conditions

Tests of Between-Subjects Effects						
Dependent Variable: average support and approval for technology						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1238.345 ^a	376	3.293	1.523	.000	.383
Intercept	19182.143	1	19182.143	8868.056	.000	.906
male0fem1	49.110	1	49.110	22.704	.000	.024
term	9.894	3	3.298	1.525	.207	.005
actor	11.057	1	11.057	5.112	.024	.006
control	2.654	2	1.327	.614	.542	.001
purpose	220.009	3	73.336	33.904	.000	.099

prev_prom	1.181	1	1.181	.546	.460	.001
male0fem1 * term	14.443	3	4.814	2.226	.084	.007
male0fem1 * actor	.681	1	.681	.315	.575	.000
male0fem1 * control	4.120	2	2.060	.952	.386	.002
male0fem1 * purpose	5.879	3	1.960	.906	.438	.003
male0fem1 * prev_prom	2.673	1	2.673	1.236	.267	.001
term * actor	2.523	3	.841	.389	.761	.001
term * control	9.657	6	1.609	.744	.614	.005
term * purpose	4.190	9	.466	.215	.992	.002
term * prev_prom	8.195	3	2.732	1.263	.286	.004
actor * control	6.344	2	3.172	1.467	.231	.003
actor * purpose	2.910	3	.970	.448	.718	.001
actor * prev_prom	.045	1	.045	.021	.885	.000
control * purpose	7.189	6	1.198	.554	.767	.004
control * prev_prom	.165	2	.083	.038	.963	.000
purpose * prev_prom	4.187	3	1.396	.645	.586	.002
male0fem1 * term * actor	10.700	3	3.567	1.649	.177	.005
male0fem1 * term * control	28.896	6	4.816	2.226	.039	.014
male0fem1 * term * purpose	23.231	9	2.581	1.193	.296	.012
male0fem1 * term * prev_prom	9.424	3	3.141	1.452	.226	.005
male0fem1 * actor * control	6.627	2	3.313	1.532	.217	.003
male0fem1 * actor * purpose	7.042	3	2.347	1.085	.354	.004
male0fem1 * actor * prev_prom	1.342	1	1.342	.620	.431	.001
male0fem1 * control * purpose	19.635	6	3.272	1.513	.171	.010

male0fem1 * control * prev_prom	4.872	2	2.436	1.126	.325	.002
male0fem1 * purpose * prev_prom	5.769	3	1.923	.889	.446	.003
term * actor * control	7.582	6	1.264	.584	.743	.004
term * actor * purpose	11.769	9	1.308	.605	.794	.006
term * actor * prev_prom	.243	3	.081	.037	.990	.000
term * control * purpose	36.503	18	2.028	.938	.532	.018
term * control * prev_prom	13.262	6	2.210	1.022	.409	.007
term * purpose * prev_prom	28.972	9	3.219	1.488	.147	.014
actor * control * purpose	17.407	6	2.901	1.341	.236	.009
actor * control * prev_prom	2.624	2	1.312	.606	.545	.001
actor * purpose * prev_prom	.517	3	.172	.080	.971	.000
control * purpose * prev_prom	12.284	6	2.047	.947	.461	.006
male0fem1 * term * actor * control	27.253	6	4.542	2.100	.051	.013
male0fem1 * term * actor * purpose	18.336	9	2.037	.942	.488	.009
male0fem1 * term * actor * prev_prom	2.466	3	.822	.380	.767	.001
male0fem1 * term * control * purpose	50.864	18	2.826	1.306	.175	.025
male0fem1 * term * control * prev_prom	8.959	6	1.493	.690	.658	.004
male0fem1 * term * purpose * prev_prom	20.708	9	2.301	1.064	.387	.010

male0fem1 * actor * control * purpose	9.311	6	1.552	.717	.636	.005
male0fem1 * actor * control * prev_prom	15.926	2	7.963	3.681	.026	.008
male0fem1 * actor * purpose * prev_prom	8.098	3	2.699	1.248	.291	.004
male0fem1 * control * purpose * prev_prom	23.910	6	3.985	1.842	.088	.012
term * actor * control * purpose	30.677	18	1.704	.788	.716	.015
term * actor * control * prev_prom	3.603	6	.600	.278	.948	.002
term * actor * purpose * prev_prom	27.039	9	3.004	1.389	.188	.013
term * control * purpose * prev_prom	39.867	18	2.215	1.024	.429	.020
actor * control * purpose * prev_prom	15.475	6	2.579	1.192	.308	.008
male0fem1 * term * actor * control * purpose	32.950	18	1.831	.846	.645	.016
male0fem1 * term * actor * control * prev_prom	8.953	6	1.492	.690	.658	.004
male0fem1 * term * actor * purpose * prev_prom	13.473	9	1.497	.692	.717	.007
male0fem1 * term * control * purpose * prev_prom	38.611	18	2.145	.992	.467	.019
male0fem1 * actor * control * purpose * prev_prom	21.657	6	3.609	1.669	.126	.011

term * actor * control * purpose * prev_prom	39.377	18	2.188	1.011	.444	.019
male0fem1 * term * actor * control * purpose * prev_prom	34.326	11	3.121	1.443	.148	.017
Error	1996.505	923	2.163			
Total	30508.750	1300				
Corrected Total	3234.850	1299				

a. R Squared = .383 (Adjusted R Squared = .131)