RESEARCH IN BRIEF

Public Attitudes about Aerial Drone Activities - Results of National Survey

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Unmanned Aerial Vehicles (UAV) or Unmanned Aircraft Systems (UAS), commonly known as "drones," collect information and provide visual monitoring of activities in a variety of public and private settings. These free-flying aircraft are controlled by remote and digital technology. Sites in six states (Alaska, New York, Nevada, North Dakota, Texas, and Virginia) have been federally designated as test locations for identifying operational and safety issues associated with drone technology.

Although several national opinion polls have been conducted over the last several years on drone use for military purposes, less is known about public attitudes and support for drone usage in other contexts. These additional contexts for drone applications include land use patterns, geographical/climatic photo mapping, crowd management, and specific areas within criminal justice (e.g., border patrols, detecting traffic violators, home and business security). Due to the recent dramatic growth in media attention to drone technology, it is more important to establish an empirical baseline of the current level of public knowledge and attitudes about aerial drone usage to track future changes in the public's acceptance of this emerging technology.

This Research in Brief summarizes the results of multiple national surveys of public knowledge and support of the use of aerial drone technology in a variety of public and private settings. It is based on samples of 636 U.S. adult citizens who completed internet surveys in the first week of June 2014. A summary of the results, demographic factors associated with levels of awareness and support for drone usage, the public policy implications of these findings, and the limitations of this study are discussed below.

HIGHLIGHTS

- Most adults survey respondents in the U.S. report that they have heard or read about drone usage in various public and private settings.

- Public awareness of drone usage is greatest in the area of military operations (91% had heard about military drone use). Knowledge of drone usage is least common for journalistic news reporting (36%) and crowd monitoring (35%).

- Public support for drone usage varies widely across contexts. Support is greatest for search and rescue activities (93% support) and climatic/geological mapping (87%). The lowest support for drone use is for crowd monitoring at large public events (43%) and for package delivery services to private residences (42%).

- The vast majority (72%) of respondents are "very concerned" about using aerial drones to monitor daily activities around their homes. Their level of being "very concerned" about drone usage decreased appreciably when it involved monitoring people at their place of work (46%) and in public places like parks and schools (26%).

- Public support for drone use in different contexts is strongly associated with the socio-demographic characteristics of the respondents (e.g., age, marital status, political party affiliation, income, views about public safety and individual rights).

Data Source and Methods

During the first week of June 2014, online surveys were administered to a national sample of U.S. residents over 18 years of age. Survey samples were provided by three commercial survey platforms: (1) *Survey Monkey,* (2) *Qualtrics* and (3) *Mechanical Turk*. A total of 636 surveys were completed within this one-week period. Comparisons of the demographic profile of respondents revealed some basic differences across the samples (e.g., Survey Monkey yielded a more educated and higher income sample; Mechanical Turk's sample was considerably younger than the other samples).[i] There were also some differences across samples in the level of support and opposition to drone usage (e.g., *Mechanical Turk* respondents were far less supportive of military drone usage).

Although there are sample differences in the levels of public knowledge and support for particular applications of drone technology, the relative rankings of these different applications across samples are highly correlated (i.e., Spearman's rank-order correlation range from .77 to .97 across samples). Given these high inter-correlations across samples, findings from the three samples can be combined without loss of generality. Thus, the following results are based on the combined samples of 636 respondents.

Public Awareness of Drone Usage in Different Contexts

The percentage of survey respondents that had read or heard about drone usage varies widely across different contexts or areas of application. As shown in Table 1, a majority of these U.S. adults said they are aware of the use of aerial drones in military operations (91%), delivery services (e.g., mail, books) to private residences (73%), search and rescue operations (61%), climatic/geographical photo mapping (59%), and international border patrol activities (56%). In contrast, less than half of them reported being aware of drone usage in the areas of traffic monitoring (44%), detecting criminal activity in open public places (41%), journalists' coverage of news events (36%), and crowd monitoring at large public events (35%).

The level of public awareness of aerial drone usage also varies across different socio-demographic groupings. For example, men are far more likely than women to report hearing about drone usage in each context and these gender differences are relatively large (i.e., 10 to 20% higher for men). Individuals with higher educational attainment (i.e., college graduates vs. high school graduates), higher incomes (i.e., >$100,000 vs. <$25,000 in annual income), and greater technological expertise (i.e., high vs low self-reported knowledge of technology) also report

Table 1: Public Awareness of Aerial Drone Usage in Different Areas	
Area of Drone Use:	**% Heard/Read About Drone Use in...**
Military Operations (e.g., detection/tracking of military targets)	91%
Delivery Services for Small Items (e.g., mail, books) to Private Residences	73%
Search and Rescue Operations in Remote Areas (e.g., finding missing/injured persons)	61%
Climatic/Geological Mapping (e.g., testing snow/water/vegetation levels)	59%
International Border Patrol (e.g., monitoring immigration activities)	56%
Traffic Monitoring on Major Highway Routes (e.g., reporting back-ups and delays during rush hour)	44%
Detecting Criminal Activities in Open Public Places (e.g., street-level drug dealing)	41%
Journalists' Reporting/Coverage of News Events (e.g., natural disasters, crime scenes, sporting events)	36%
Crowd Monitoring at Large Public Events (e.g., sporting events, concerts)	35%
Source: National surveys conducted June 1-5, 2014 (n = 636)	

greater awareness of drone usage across these different contexts. However, no consistent patterns of group differences in public awareness of drone usage were found on the basis of the respondent's age, race/ethnicity, marital status, political party affiliation, or urban/rural residency.

Public Support of Drone Usage in Different Contexts

Similar to their awareness of drone technology, the level of public support for using aerial drones varies across different contexts. These area-specific differences in support for drone usage are summarized in Table 2.

As shown in Table 2, there are large differences in the level of public support for aerial drone usage across different application areas. The strongest support for aerial drone use is in search and rescue operations (93% support use in this context), followed closely by their use in climatic and geological mapping activities (87%). A clear majority of adult respondents also approve of aerial drone usage in military operations (73%), traffic monitoring (71%), and international border patrol activities (68%). Less than a majority of respondents support drone usage within the context of detecting criminal activity in public places (48%), crowd monitoring at large public events (43%) and delivering small parcels to private residences (42%).

The level of public support for aerial drone usage in each area exhibits variation across different socio-demographic groupings. Some of the largest differences involve groups defined by age categories, political party affiliation their different views about the role of government, and annual income level. These group comparisons reveal the following patterns in support for drone usage:

- Persons over 50 years old are far more supportive of drone usage in areas involving military and criminal justice activities than persons under 30 years old. For example, support for drone use in military operations ranged from 88% among adults over 50 years old to only 55% among those under 30. Similar age differences in support for drone use are found for "detecting crime in open public places" (63% vs 35%, respectively) and "international border patrol activities" (81% vs 51%, respectively).

- Republicans are more supportive of drone use than Democrats in international border patrol activities (87% vs 52%) and military operations (85% vs. 72%). In contrast, Democrats are more supportive of drone use than Republicans in the areas of journalists' news reporting (65% vs. 49%) and climatic/geographical mapping (91% vs. 81%).

Table 2: Public Support for Aerial Drone Usage in Different Areas	
Area of Drone Use	**% Supporting Drone Use in...**
Search and Rescue Operations in Remote Areas (e.g., finding missing/injured persons)	93%
Climatic/Geological Mapping (e.g., testing snow/water/vegetation levels)	87%
Military Operations (e.g., detection/tracking of military targets)	73%
Traffic Monitoring on Major Highway Routes (e.g., reporting back-ups and delays during rush hour)	71%
International Border Patrol (e.g., monitoring immigration activities)	68%
Journalists' Reporting/Coverage of News Events (e.g., natural disasters, crime scenes, sport events)	56%
Detecting Criminal Activities in Open Public Places (e.g., street-level drug dealing)	48%
Crowd Monitoring at Large Public Events (e.g., sporting events, concerts)	43%
Delivery Services for Small Items (e.g., mail, books) to Private Residences	42%
Source: National surveys conducted June 1-5, 2014 (n = 636)	

- Persons who prefer a government that places more emphasis on "public safety" than "individual rights" are far more likely to support drone usage in military and law enforcement operations. These group differences between "public safety" and "individual rights" proponents are most pronounced for using aerial drones for detecting crime in open public places (69% vs. 34% support this activity), crowd monitoring (60% vs. 30%), military operations (83% vs. 66%), and international border patrol activities (78% vs 61%).

- Persons with an annual income of greater than $100,000 are more supportive of drone use in a variety of areas than persons with annual incomes of less than $25,000. The largest income differences in drone support are found in the areas of military operations (79% vs. 59% support, respectively), border patrol (76% vs.57%), traffic monitoring (80% vs. 63%), and detecting crime in public places (55% vs. 41%).

- Group differences in public support for drone usage in various contexts are less dramatic and consistent across domains on the basis of the respondent's gender, marital status, and urban/rural residency.

Concerns about Monitoring Daily Activities with Aerial Drones

An alternative measure of the public's support for aerial drone usage involves their level of concern about using aerial drones for monitoring people's daily activities in the following three settings: (1) in public places (e.g., parks, streets, schools), (2) at their place of work, and (3) around their homes. Table 3 summarizes the distribution of these particular attitudes in each setting.

As shown in Table 3, the majority of respondents have at least some concern about using aerial drones in both public and private settings. However, there are major differences in the magnitude of this concern across different public and private settings. In particular, nearly three-fourths (72%) of these adults are "very concerned" about drone monitoring of people's daily activities around their home. Nearly half (46%) of them are also "very concerned" about drone monitoring at their place of work, but only about one fourth (26%) reported being very concerned about drone monitoring of people's daily activities in public places like parks, streets, and schools.

Table 3: Level of Concern About Drone Use for Monitoring People's Daily Activities...			
	In Public Places	At Their Workplace	Around the Home
Not Concerned at All	28%	15%	9%
Somewhat Concerned	46%	39%	19%
Very Concerned	26%	46%	72%
	100%	100%	100%
Source: National surveys, June 1-5, 2014 (n = 636)			

Contrary to the results for drone usage support, there are only a few substantial differences in the level of public concern about drone use in public and private places across particular socio-demographic groups. For example, individuals who believe that the government should place greater importance on "individual rights" are far more likely than "public safety" proponents to be "very concerned" about drone monitoring of daily activities in both public places and private settings. Persons who report high technological expertise are also more likely to be "very concerned" about drone monitoring in each setting than their less technical counterparts. However, for all other socio-demographic groups, only small differences exist in their amount of concern about drone monitoring activity.

Implications for Public Policy on Aerial Drone Usage

The use and proposed applications of aerial drone technology in a variety of public and private settings is at the center of ongoing public policy debates about the issues of public safety, personal privacy, and the acceptable balance between them. Currently, sites in 6 states have been designated as locations for developing operational practices and policies about this technology. Effective public policy on aerial drone usage must address public concerns about this technology, to ensure that users will comply with guidelines and restrictions as to how drones may be used.

Based on the findings from this national survey, public acceptance of aerial drone usage is highly contextual, depending upon the specific area of its application. Respondents were most supportive of aerial drone use in emergency situations (i.e., search and rescue operations in remote areas) and for environmental monitoring (e.g., climatic/geographical mapping). They were far less supportive of using aerial drones for monitoring people's activities in public places (e.g., crowd monitoring) and even for detecting criminal activity in open public places. The vast majority of respondents were also "very concerned" about using aerial drones for monitoring people's daily activities around their homes and about half of them voiced similar levels of concern about drone monitoring at their place of work.

From a public policy perspective, these survey findings suggest that aerial drone usage in public and private settings is a controversial social issue that is represented by both strong levels of support and opposition across these settings. Some variation in the levels of public support for drone usage in particular situations is explained by the rater's socio-demographic characteristics (e.g., age, income, political party affiliation, views about government policy priorities, and technological expertise).

The development of effective public policy around this emerging technology, however, requires a better understanding of the nature and correlates of these public attitudes toward drone usage in both public and private settings. To achieve this goal, the following questions will be addressed in future studies using multiple methodological approaches:

- Does the low support and high concern about aerial drone usage in some public contexts (e.g., crowd monitoring) and in more private places (e.g., at work, around one's home) derive primarily from concerns about public safety, one's personal safety, invasion of privacy, restrictions on personal freedom, growing distrust in government and private businesses to preserve/protect the public good, and/or more general concerns about living in an increasingly intrusive surveillance society?

- What are the major situational and contextual factors that influence public attitudes about using aerial drones in various settings? For example, do these attitudes vary on the basis of the frequency of monitoring (e.g., does it provide continuous or sporadic images?), the size and distance of the aerial drone from its target, the explicit purpose of its use, and the profile of its user (e.g., government agencies, private business, private citizens)?

- How does the language used to describe this technology impact public perceptions? Are individuals more supportive when terms such as "UAS" or "UAV" are used instead of "drones?" Further, if the public is made aware of existing relevant laws on privacy and personal property (e.g., lack of ownership of the airspace over one's home) currently in place, will there be greater acceptance of drone use by business and government entities?

Limitations of Research

Several limitations of the current study are notable because they place important restrictions on our substantive inferences about the nature of public attitudes toward aerial drone usage. These limitations are found in virtually all social surveys that employ a cross-sectional design. The three major limitations of the current study are summarized below.

First, this study is based on internet user groups and these groups may not be representative of all U.S. adult residents. It is well known that web users are often younger, have more formal education, and have greater knowledge of computer technology (see Bethlehem, 2010; Dillman, et al., 2008; Rice & Katz, 2003). Consequently, our inferences about "public" attitudes are restricted to the target population of U.S. internet users who may under- and over- represent particular groups in the national adult population. However, comparisons of the survey results across different demographic groupings are less affected by the sample limitations.

Second, the multiple surveys that were included in this national sample were conducted at one point in time (June 1-5, 2014) and may be susceptible to particular historical effects (i.e., some drone-related event that occurred at the same time as the survey influence the obtained results). Although issues of drone usage have been a popular topic in various forms of mass media over the last several years, we are unaware of any particular event in this time period that would have adversely affected the results of this survey.

Third, question wording may dramatically affect the observed results in any survey. Within the current study, we attempted to use less affective and

pejorative language in the survey (e.g., using the term "monitoring" rather than "surveillance"). The survey wording was also designed to increase the reliability and validity of the responses by providing a short, written description and examples of each particular area of drone usage. However, even the choice of the particular examples to provide a reference point for the respondents may have some influence on the obtained results.

Due to these limitations of the current study, we recommend that some caution be exercised when interpreting the observed findings and making inferences about national practices. Subsequent studies are now being proposed and conducted to further assess the robustness of the current findings across other sampling frames, different time periods, and alternative question wording.

References

Bethlehem, J. (2010). "Selection bias in web surveys." *International Statistical Review. 78(2)*: 161-188.

Dillman, D.A., Smyth, J.D. & Christian, L.M. (2008). *Inter-net, Mail, and Mixed-Mode Surveys, The Tailored Design Method.* Hoboken, NJ: John Wiley & Sons.

Heen, M., Miethe, T.D., & Lieberman, J.D. (2014). "A comparison of different on-line sampling approaches for generating national samples." *State Data Brief.* Center for Crime and Justice Policy: Las Vegas, NV. CCJP 2014-01.

Rice, R.E., & Katz, J.E. (2003). "Comparing internet and mobile phone usage: Digital divides of usage, adoption, and dropouts." *Telecommunications Policy, 27(8)*: 597-623.

Endnotes

i   For a complete comparison of the results from the different internet sampling frames, see Heen et al. (2014).

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STATE DATA BRIEF SERIES

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