441 G St. N.W.
Washington, DC 20548

Accessible Version

July 20, 2017

The Honorable Bennie G. Thompson
Ranking Member
Committee on Homeland Security
House of Representatives

The Honorable Bonnie Watson Coleman
Ranking Member
Subcommittee on Transportation and Protective Security
Committee on Homeland Security
House of Representatives

Aviation Security: TSA Does Not Have Valid Evidence Supporting Most of the Revised Behavioral Indicators Used in Its Behavior Detection Activities

Congressional Requesters:

Over the past 10 years, the Transportation Security Administration (TSA) has employed thousands of trained behavior detection officers (BDO) to identify passengers exhibiting behaviors indicative of stress, fear, or deception at airport screening checkpoints. According to TSA, certain verbal and nonverbal cues and behaviors—TSA's behavioral indicators—may indicate mal-intent, such as the intent to carry out a terrorist attack.[1] These behavioral indicators include, for example, assessing the way an individual swallows or the degree to which an individual's eyes are open. According to TSA, such indicators provide a means for identifying passengers who may pose a risk to aviation security and referring them for additional screening.[2]

TSA officials have reported that behavior detection methods are based on techniques that have been used by defense organizations and law enforcement agencies for years. However, we reported in November 2013 that available evidence did not support whether behavioral indicators can be used to identify persons who may pose a risk to aviation security.[3] Specifically, we reported that TSA had not demonstrated that BDOs could consistently identify the behavioral indicators and that the subjectivity of the indicators and variation in BDO referral rates raised questions about TSA's continued use of these indicators. Further, we found that decades of peer-reviewed, published research on the complexities associated with detecting deception

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[1]The exact wording and descriptions of the specific behavioral indicators are sensitive security information. The complete list of behavioral indicators is also sensitive, so in this report we only include selected examples that have been approved by TSA for public release.

[2]During referral screening, if passengers exhibit additional behaviors, or if other events occur, such as the discovery of a suspected fraudulent document, BDOs are to refer these passengers to a law enforcement officer for further investigation.

[3]GAO, *Aviation Security: TSA Should Limit Future Funding for Behavior Detection Activities*, GAO-14-159 (Washington, D.C.: Nov. 8, 2013).

through human observation also called into question the scientific basis for TSA's behavior detection activities. As a result, we recommended in November 2013 that TSA limit future funding for the agency's behavior detection activities until TSA can provide scientifically validated evidence that demonstrates that behavioral indicators can be used to identify passengers who may pose a threat to aviation security.

TSA has since reduced funding for its behavior detection activities. Although the Department of Homeland Security (DHS) did not concur with our November 2013 recommendation, TSA officials have stated that our recommendation was one of several factors in DHS's decision to support a reduction in the number of full-time equivalent (FTE) BDOs. TSA reduced the number of BDOs from the 3,131 BDO FTEs that DHS requested and funded in fiscal years 2013 through 2015 to 2,660 BDO FTEs requested in fiscal year 2016. This reduced number of BDO FTEs in fiscal year 2016 represented a reduction in annual operating costs of about $35.4 million. In fiscal year 2016, TSA officials reported that they employed 2,393 BDO FTEs at 87 airports and spent approximately $186 million on the behavior detection and analysis program.[4] Further, TSA officials reported that in the summer of 2016, the agency began taking steps to integrate BDOs into the screener workforce by assigning BDOs to the travel document checker position and other positions at passenger screening checkpoints where they are able to observe and interact with passengers in the performance of their screening duties.[5] In April 2017, TSA officials reported that all BDOs had been converted into transportation security officers with behavior detection capabilities.[6]

Since our 2013 report, TSA has also revised its list of behavioral indicators and taken steps to identify additional evidence that these indicators can be used to identify passengers who may pose a threat to aviation security. According to TSA, in 2013, the agency began an initiative to revise and shorten its list of behavioral indicators to improve program efficiency and effectiveness. To do so, TSA contracted with the American Institutes for Research (AIR)—a behavioral and social science research and evaluation organization—to convene subject matter expert panels in late 2013 and early 2014. These panels discussed how to refine TSA's behavioral indicators and the assessment methodology used when referring an individual for

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[4]According to TSA officials, this cost figure excludes the cost of behavior detection and analysis at the three Screening Partnership Program (SPP) airports that have BDOs. The SPP, established by TSA in 2004, allows TSA-regulated airports an opportunity to apply to TSA to have the screening of passengers and property performed by TSA-approved qualified private-screening contractors. See 49 U.S.C. § 44920. At SPP airports, TSA continues to be responsible for overseeing screening operations, but the contractor is responsible for hiring and training its screening personnel, including behavior detection officers, and must adhere to TSA's security standards, procedures, and requirements. According to TSA officials, because TSA pays for screening costs at SPP airports through contracts, TSA does not track all costs at SPP airports at the same level of detail as it does for the airports at which TSA has direct responsibility for the hiring and staffing of screening personnel. This review does not distinguish between behavior detection operations at SPP and non-SPP airports but rather focuses on the behavioral indicators that all BDOs are trained to apply, regardless of the airport.

[5]TSA officials reported that they made this change partially in response to a requirement in the Aviation Security Act of 2016, which was enacted in July 2016 as title III of the Federal Aviation Administration's Extension, Safety, and Security Act of 2016. See Pub. L. No. 114-190, § 3304(a)(1), 130 Stat. 615, 655 (2016). Specifically, the Act required that TSA, not later than 30 days after enactment, utilize BDOs for passenger and baggage security screening, including the verification of traveler documents, particularly at designated TSA Pre✓ ™ lanes to ensure that such lanes are operational for use and maximum efficiency. Id.

[6]For the purposes of this report, we refer to all TSA personnel conducting behavior detection activities as BDOs.

additional screening.[7] Based upon the results of these panels, in August 2014, TSA and AIR officials developed a revised list of behavioral indicators, and TSA ultimately reduced the number of indicators from 94 to 36.[8] As of April 2017, TSA was using these indicators at 10 airports. AIR also conducted a literature review to identify additional sources supporting this revised list. TSA officials reported that because the body of research in support of behavioral indicators is limited, they also identified sources such as news articles and law enforcement publications as support.[9]

In light of the steps TSA has taken following our recommendation, you asked us to evaluate the sources TSA cited as providing support for its revised list of behavioral indicators. This report assesses the extent to which TSA has valid evidence demonstrating that the specific indicators in its revised list can be used to identify passengers who pose a threat to aviation security.

We reviewed and categorized all 178 sources that, as of April 2017, TSA cited as providing support for specific indicators in its revised list of behavioral indicators to identify the extent to which they present valid evidence.[10] We defined valid evidence as original research that meets generally accepted research standards and presents evidence that is applicable in supporting TSA's specific behavioral indicators.[11] Original research sources presenting valid evidence are important because the data and conclusions they present are derived from empirical research that can be replicated and evaluated. Of the 178 total sources TSA cited, we determined that

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[7]According to TSA, the expert panels, held in November 2013 and February 2014, comprised behavior detection subject-matter experts from TSA, the Federal Bureau of Investigation, academia (national and international representatives), the United Kingdom's Department of Transport, and select AIR staff. Panel participants were asked to work in groups to decide whether to retain past indicators, retain indicators with certain changes, combine indicators, or remove indicators from the list, among other options.

[8]According to TSA, most of the 94 behavioral indicators were combined, condensed, or updated for incorporation into a revised list and a small subset were eliminated. After piloting its revised list of 38 behavioral indicators at three airports, TSA officials reported that they removed two indicators because they were difficult for BDOs to assess. TSA's final revised list includes 36 behavioral indicators and 3 non-behavioral indicators. Our review focused on TSA's use of behavioral indicators; we did not review the 3 non-behavioral indicators in TSA's revised list.

[9]In the fall of 2016, TSA also designed and conducted covert testing to determine whether BDOs could detect the revised behavioral indicators in a live airport checkpoint environment. TSA conducted a first phase of the covert testing at four airports that were using the revised list of indicators. The results of the first phase of testing are classified and thus are not included in this report. In May 2017, TSA officials stated that they were not planning any additional covert testing because all BDOs had been converted into transportation security officers with behavior detection capabilities.

[10]Two analysts independently reviewed all 178 sources TSA cited and categorized them into (1) news or opinion sources, (2) reviews of studies sources, or (3) original research sources. Any differences in the analysts' assessments were resolved through discussion. In addition to the 178 sources we reviewed, TSA initially cited an additional 9 sources as providing support for its revised list. However, TSA did not provide these 9 sources for review and, as of April 2017, stated that they should not be considered as evidence for its revised list. Further, TSA cited one additional internal source that summarizes the results of AIR's literature review. As this document summarizes other sources we reviewed and does not itself provide new evidence, we did not review this source and excluded it from our universe of 178 sources.

[11]For the purposes of this report, we defined generally accepted research standards as established practices that ensure research data are collected and analyzed in ways that allow valid and reliable conclusions to be drawn. These standards are established in, for example, RAND Corporation, *Standards for High-Quality Research and Analysis*, CP-413 (2015); William R. Shadish, Thomas D. Cook, and Donald T. Campbell, *Experimental and Quasi-Experimental Designs for Generalized Causal Inference* (Boston: Houghton Mifflin, 2002); and GAO, *Assessing the Reliability of Computer-Processed Data,* GAO-09-680G (Washington, D.C.: July 2009).We defined applicable as whether the information and conclusions presented in a source relate to the specific behavioral indicators TSA had determined the source supports.

137 are news or opinion sources, and we took no further action because these do not meet our definition of valid evidence. We determined that 21 of the 178 sources are reviews of studies—sources that rely on the source author's assertion of support for the indicator rather than original analysis, methods, or data that can be independently used as valid evidence. Because these reviews of studies do not include underlying data and methods to support their conclusions, we were unable to evaluate whether these conclusions provide valid evidence in support of behavioral indicators.[12] As such, we limited our assessment of these reviews of studies to determining whether they are applicable to the behavioral indicators TSA identified them as supporting.[13] We determined that the remaining 20 sources are original research—sources reporting original data and methods—and assessed each source against generally accepted research standards. Specifically, two social science analysts independently reviewed all 20 original research sources to determine (1) the reliability and validity of the data and methods used, and (2) the applicability of the research to the behavioral indicators TSA maintains they support. The analysts resolved any differences in their assessments through discussion. To better understand the steps TSA has taken and evidence TSA has used to substantiate its revised list of behavioral indicators, we also interviewed TSA and AIR officials and analyzed documentary evidence from these entities.

We conducted this performance audit from November 2016 to July 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Results in Brief

TSA does not have valid evidence that most of the indicators in its revised list of behavioral indicators can be used to identify individuals who may pose a threat to aviation security. In our review of all 178 sources TSA cited in support of its revised list, we found that 98 percent (175 of 178) of the sources do not provide valid evidence applicable to the specific indicators that TSA identified them as supporting. In total, we found that TSA does not have valid evidence to support 28 of its 36 revised behavioral indicators, has one source of valid evidence to support each of 7 indicators, and has 2 sources of valid evidence to support 1 indicator.

We are not making any new recommendations in this report. TSA has taken steps to limit funding for the program and, based on our findings in this report, we believe TSA should continue to limit funding for the agency's behavior detection activities until TSA can provide valid evidence that demonstrates that behavioral indicators can be used to identify passengers who may pose a threat to aviation security, as we recommended in our November 2013 report.

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[12]According to TSA officials, any relevant sources cited within the 21 reviews of studies would have been reviewed by AIR officials during the literature review and, if found to be pertinent, would have been included separately in TSA's list of 178 sources.

[13]Two analysts independently assessed the applicability of all 21 reviews of studies to the specific behavioral indicators TSA had determined they supported. Any differences in the analysts' assessments were resolved through discussion. While news or opinion and reviews of studies sources may provide useful context for TSA, and may suggest behaviors that could be validated, they are not the type of support TSA could use as valid evidence in and of themselves to support its behavioral indicators, because they do not include the underlying data and methods supporting their conclusions.

Background

The Aviation and Transportation Security Act established TSA as the federal agency with primary responsibility for securing the nation's civil aviation system, which includes the screening of all passengers and property transported by commercial passenger aircraft.[14] At approximately 440 TSA-regulated airports in the United States, all passengers, their accessible property, and their checked baggage are screened prior to boarding an aircraft or entering the sterile area of an airport pursuant to statutory and regulatory requirements and TSA-established standard operating procedures.[15] TSA began piloting its behavior detection program in 2003 as an added layer of security to identify potentially high-risk passengers through behavior detection and analysis techniques.

TSA's behavior detection screening process involves BDOs who observe passengers at the screening checkpoint and engage them in brief verbal exchanges. If a BDO determines that a passenger is exhibiting a certain number of behavioral indicators, the BDO refers this passenger for additional screening or, in some cases, contacts a law enforcement officer (LEO).[16] If referred for additional screening, passengers undergo a pat-down and search of their personal property while BDOs check travel documents and converse with the passengers while continuing to look for additional behavioral indicators. If a passenger does not exhibit a certain number of additional indicators, the passenger is allowed to proceed to the boarding gate. If the passenger does exhibit a certain number of additional indicators, or other events occur, such as the discovery of a fraudulent document, the BDO calls a LEO, who may choose to question the passenger or conduct a criminal background check. The LEO then determines whether to release the passenger, refer the passenger to another law enforcement agency, or arrest the passenger.[17]

TSA Does Not Have Valid Evidence to Support Most of the Behavioral Indicators in its Revised List

In our review of all 178 sources TSA cited in support of its revised list of behavioral indicators, we found that 98 percent (175 of 178) of the sources do not provide valid evidence applicable to the specific indicators TSA identified them as supporting. Specifically, we found that 92 percent of the sources TSA cited (163 of 178) in support of its revised list of behavioral indicators do not meet generally accepted research standards. These 163 sources represent news stories or opinion articles, reviews of studies, and original research that do not meet generally accepted

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[14]See Pub. L. No. 107-71, 115 Stat. 597 (2001); 49 U.S.C. §§ 114(a), (d), 44901. For the purposes of this report, "commercial passenger aircraft" generally encompasses the scheduled passenger operations of U.S.-flagged air carriers operating in accordance with their TSA-approved security programs and foreign-flagged air carriers operating in accordance with security programs deemed acceptable by TSA. See 49 C.F.R. pts.1544 (governing U.S.-flagged air carriers) and 1546 (governing foreign-flagged carriers).
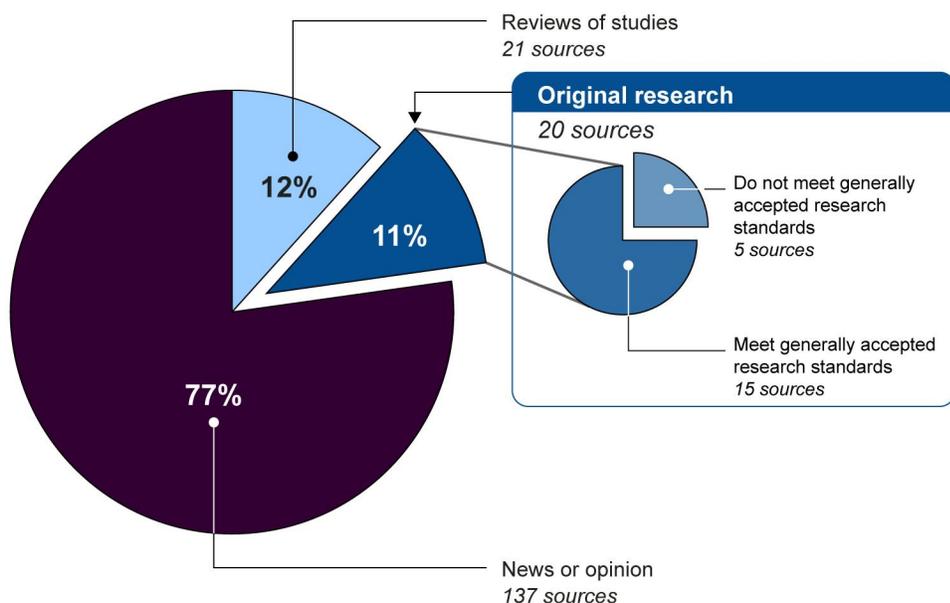
[15]See, e.g., 49 U.S.C. §§ 114(e), 44901-02; 49 C.F.R. §§ 1540.107, 1540,109, 1544.201-1544.203, 1546.201-1546.203. The sterile area of an airport is that area defined in the airport security program that provides passengers access to boarding aircraft and to which access is generally controlled through the screening of persons and property. See 49 C.F.R. § 1540.5.

[16]A small number of behavioral indicators in TSA's list, if exhibited by passengers, require BDOs to immediately contact law enforcement.

[17]LEOs may also choose not to respond when contacted by a BDO. Regardless of whether a LEO responds, the federal security director or designee is responsible for reviewing the circumstances surrounding a LEO or other referral and making a determination about whether the passenger can proceed into the sterile area.

research standards. Fifteen of the sources TSA cited do meet generally accepted research standards; however, we found that the evidence presented in 12 of these 15 sources is not applicable to the specific behavioral indicators TSA cited them as supporting. Figure 1 breaks out the results of our review and categorization of all 178 sources.

Figure 1: Sources Cited by the Transportation Security Administration (TSA) in Support of Its Revised List of Behavioral Indicators by Category

Source: GAO analysis of TSA data. | GAO-17-608R

Data Table for **Figure 1: Sources Cited by the Transportation Security Administration (TSA) in Support of Its Revised List of Behavioral Indicators by Category**

	Percentage	Number of sources
Review of studies	12	21
Original research	11	20
News or opinion	77	137

Breakdown of Original Research (20 sources)

- 15 sources Meet generally accepted research standards
- 5 do not meet generally accepted research standards

Note: News or opinion sources and reviews of studies sources do not meet generally accepted research standards.

News or opinion sources. We classified 77 percent of the sources TSA cited (137 of 178) as news or opinion sources that do not present original research meeting generally accepted research standards. Sources in this category include news articles reporting on suicide bombing

incidents overseas, publications and presentations created by law enforcement entities and industry groups, and screen shots of online medical websites. For example, among other sources, TSA cited four separate news articles that provide eyewitness accounts of a single 2005 suicide bombing incident at an Israeli bus station as support for 2 behavioral indicators. In another example, TSA cited a 2004 newsletter published by the New Hampshire Police Standards and Training Council as support for 11 behavioral indicators.

Reviews of studies. We classified 12 percent of the sources TSA cited (21 of 178) as reviews of studies—sources that may reference original research in the text, but do not themselves present original analysis, methods, or data whose reliability and validity can be assessed. These sources include journal articles and books reviewing existing literature, among other sources. For example, TSA cited an academic journal article that presents certain behaviors a suicide bomber may exhibit as support for 10 behavioral indicators and cited an unpublished Master's thesis as support for 23 behavioral indicators.[18] While such sources may provide useful context for TSA and may suggest behaviors that could be validated, they are not the type of support TSA could use as valid evidence in and of themselves to support its behavioral indicators because they do not include the underlying data and methods supporting their conclusions.[19]

Original research. We classified 11 percent of the sources TSA cited (20 of 178) as original research—sources that report original data and methods. Original research sources that meet generally accepted research standards are the type of support TSA could use as valid evidence to support its use of behavioral indicators because these sources present data and conclusions derived from empirical research that can be replicated and evaluated. We found that 5 of the 20 original research sources TSA cited do not meet generally accepted research standards. For example, one original research source used to support 16 indicators relies upon testimonial evidence obtained from interviews with 16 Israelis.[20] While this does constitute original research, the source does not meet generally accepted research standards because it does not describe the methodology for collecting and analyzing this evidence or present any of the testimonial evidence from these interviews. Rather, the source document notes that its findings are "based on a quick review of a subset of 8 interviews and interviewer notes/memory for other interviews." Fifteen of the 20 original research sources cited by TSA do meet generally accepted research standards. For example, TSA cited an academic journal article that presents the results of two original experiments designed to assess the behavioral differences between liars and truth tellers. However, we found that the evidence presented in 12 of these 15 sources

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[18]Some reviews of studies sources TSA cited as support for behavioral indicators present conflicting information on whether the use of behavioral indicators and behavior detection more generally is useful in identifying individuals who may pose a threat to security. For example, one article states that indicators of suicide bombers "are drawn from multiple sources and have not been formally or empirically validated." Another states that indicators used by law enforcement to identify potential suicide bombers are "vague, contradictory, and so broad as to be useless."

[19]We did not assess whether any additional sources cited within these reviews of studies meet our criteria for valid evidence because, according to TSA, any relevant sources would have been reviewed by AIR officials during the literature review and, if found to be pertinent, would have been included separately in TSA's list of 178 sources. However, we did assess the applicability of all 21 reviews of studies sources to the specific behavioral indicators TSA had determined they supported. TSA cited these 21 reviews of studies a total of 89 times in support of its behavioral indicators. TSA often cited a single source as support for numerous behavioral indicators. A citation refers to when TSA cited one source as support for one indicator. We found that for 34 of the 89 total citations, the information and conclusions presented in the source document are not applicable as support for the specific behavioral indicator cited by TSA.

[20]According to TSA documentation, 12 individuals were subject matter experts and 4 were eyewitnesses to suicide attacks.

that meet generally accepted research standards is not applicable to the specific behavioral indicators TSA cited them as supporting. Thus, we found that only 3 original research sources both meet generally accepted research standards and are applicable to the specific behavioral indicators TSA cited them as supporting.

As a result of our analysis, we determined that TSA does not have valid evidence supporting 28 of its 36 revised behavioral indicators. Specifically, every source TSA cited in support of these 28 indicators is a news or opinion source, a review of studies source, or an original research source that either does not meet generally accepted research standards or is not applicable to the behavioral indicator it was provided to support.[21] For example, TSA cited 105 sources to support the use of indicator number 11, which involves BDOs identifying individuals who seem to be attempting to conceal their normal appearance. However, we found that none of the 105 sources present original research that meets generally accepted research standards. In another example, TSA cited 63 sources to support the use of indicator number 5, which involves BDOs identifying individuals who seem to be sweating heavily. While we found that one of the 63 sources cited is original research that meets generally accepted research standards, we also found that this source does not present evidence that is applicable as support for this indicator. Table 1 lists the total number of sources TSA cited as support for each indicator and the number of sources we found to provide valid evidence.

Table 1: Overview of the 178 Sources the Transportation Security Administration (TSA) Cited as Support for Its Revised List of 36 Behavioral Indicators

Behavioral indicator number	Number of sources TSA cited as support for indicator[a]	Number of sources with valid evidence supporting indicator
1	7	1[b]
2	6	0
3	4	0
4	40	1[b]
5	63	0
6	6	0
7	5	0
8	8	1[b]
9	43	0
10	88	0
11	105	0
12	25	0
13	33	0
14	4	0
15	20	0
16	24	0
17	24	0

[21]TSA did not cite any sources to support the use of indicator number 29. According to TSA, this indicator is based on input from a subject-matter expert.

Behavioral indicator number	Number of sources TSA cited as support for indicator[a]	Number of sources with valid evidence supporting indicator
18	5	0
19	27	1
20	13	0
21	2	0
22	4	1[b]
23	1	0
24	4	1[b]
25	1	0
26	1	1[b]
27	7	2[b]
28	6	0
29	0	0
30	6	0
31	12	0
32	4	0
33	13	0
34	36	0
35	35	0
36	40	0

Source: GAO analysis of TSA data. | GAO-17-608R

[a]The total number of sources cited by TSA as support for the 36 indicators does not equal 178 because TSA often cited a single source as support for numerous behavioral indicators.

[b]These 7 behavioral indicators are all supported by the same original research source with indicator number 27 also having an additional supporting source.

We found that TSA has valid evidence supporting 8 of the 36 revised behavioral indicators. Of the 15 original research sources that meet generally accepted research standards, we found that 3 provide valid evidence to support these 8 indicators. Specifically, 7 of the 8 indicators have one source that presents valid evidence supporting their use while 1 indicator has 2 sources.[22]

Agency Comments and Our Evaluation

We provided a draft of this product to DHS for comment. In its response, reproduced in enclosure 1, DHS highlighted information related to the merits of behavior detection more broadly. DHS also provided technical comments, which we incorporated as appropriate.

In its response, DHS reiterated that TSA has converted all BDOs into transportation security officers with behavior detection capabilities, thereby eliminating the stand-alone BDO position. According to a senior TSA official, these transportation security officers are required to spend at

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[22]One of the 3 sources providing valid evidence is used to support 7 behavioral indicators.

least a certain number of hours per pay period conducting behavior detection activities to ensure that the capability is regularly practiced and sustained. As of June 2017, this same official stated that TSA continues to conduct behavior detection training and is taking steps to improve its overall behavior detection capability. We remain concerned that TSA continues to deploy behavior detection as a security measure without having valid evidence of its effectiveness in identifying passengers who may pose a threat to aviation security.

DHS also stated that behavior detection has been shown to be a successful tool in preventing individuals from circumventing screening at airports. Although DHS did not cite any examples of how its behavior detection activities have thwarted threats to the nation's civil aviation system, it cited an instance where TSA's behavior detection activities led to the identification of an individual attempting to conceal illegal drugs at an airport screening checkpoint. DHS asserted that the techniques used by individuals attempting to conceal illegal drugs may also be used by terrorists to conceal explosives, thus suggesting that behavior detection may be useful in identifying would-be terrorists. However, as we reported in our November 2013 report on TSA's behavior detection activities,[23] a 2008 study reviewing behavior detection programs for the Department of Defense found that success in identifying deception and intent in some studies incorrectly equates success in identifying terrorists with the identification of drug smugglers, warrant violators, and others.[24]

Further, in its letter, DHS cited passages from a 2013 RAND report as providing support for TSA's use of behavior detection.[25] However, the report DHS cited does not clearly support TSA's use of behavior detection. As DHS noted, the RAND report states that there is value and unrealized potential for using behavioral indicators as part of a system to detect attacks. However, the indicators reviewed in the RAND study could not be used in real time in an airport environment, as we reported in 2013. Further, the RAND report refers to behavioral indicators that are defined and used significantly more broadly than those used by TSA. For example, the RAND report includes indicators such as mobile device tracking, monitoring online activity, and changes in lifestyle patterns.

DHS also stated that there are certain common-sense indicators that TSA cannot reasonably ignore, with or without valid evidence. Specifically, DHS highlighted the indicator "unusual exposed wires or electrical switches on a person." We recognize DHS's position that certain common-sense indicators of mal-intent should not be ignored. However, TSA's revised list of 36 behavioral indicators also includes indicators that are subjective, such as assessing the way an individual swallows or evaluating the degree to which an individual's eyes are open. We continue to believe that TSA's behavioral indicators should be supported by valid evidence, as we reported in 2013.

Last, in its response, DHS also emphasized that behavior detection activities have been used by other federal entities such as U.S. Customs and Border Protection and the Federal Bureau of Investigation as well as internationally by several countries as part of their aviation security

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[23]GAO-14-159.

[24]JASON, The MITRE Corporation, S. Keller-McNulty, study leader, *The Quest for Truth: Deception and Intent Detection*, a special report prepared for the U.S. Department of Defense, October 2008. The JASON Program Office is an independent scientific advisory group that provides consulting services to the U.S. government on matters of defense science and technology.

[25]P. K. Davis, W. L. Perry, R. A. Brown, D. Yeung, P. Roshan, and P. Voorhies, *Using Behavioral Indicators to Help Detect Potential Violent Acts: A Review of the Science Base.* (Santa Monica, California: RAND Corporation, 2013).

programs. While it is possible that behavior detection activities in other contexts may have proven useful, TSA has not yet presented any evidence to demonstrate how these other behavior detection capabilities in use across the government support its use of behavior detection activities to secure the civil aviation system of the United States.

We are sending copies of this report to the appropriate congressional committees and the Secretary of Homeland Security. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report, please contact Nancy Kingsbury at (202) 512-2700 or kingsburyn@gao.gov or Jenny Grover at (202) 512-7141 or groverj@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report include Maria Strudwick (Assistant Director), David Alexander, Claudia Becker, Bryan Bourgault, Bruce Crise, Dominick Dale, Michele Fejfar, Eric Hauswirth, Nancy Kawahara, Thomas Lombardi, Amanda Miller, Rachel Stoiko, and Jeff Tessin.

Nancy R. Kingsbury, Ph.D.
Managing Director, Applied Research and Methods

Jennifer A. Grover
Director, Homeland Security and Justice Issues

Enclosure - 1

Enclosure I: Comments from the Department of Homeland Security

U.S. Department of Homeland Security
Washington, DC 20528

Homeland Security

June 22, 2017

Nancy R. Kingsbury, Ph.D.
Managing Director, Applied Research and Methods
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Jennifer A. Grover
Director, Homeland Security and Justice Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Re: Management's Response to Draft Correspondence GAO-17-608R, "AVIATION SECURITY: TSA Does Not Have Valid Evidence Supporting Most of the Revised Behavioral Indicators Used in Its Behavior Detection Activities"

Dear Dr. Kingsbury and Ms. Grover:

Thank you for the opportunity to comment on this draft correspondence. The U.S. Department of Homeland Security (DHS) appreciates the U.S. Government Accountability Office's (GAO) work in planning and conducting its review and issuing this correspondence, which did not include any new recommendations.

The Transportation Security Administration (TSA) leverages behavior detection capabilities in its frontline screening workforce to complement screening technology. Behavior detection is a non-invasive technique that increases the potential of an employee to engage passengers and detect potentially dangerous individuals, terrorists, and criminals. Implemented in 2006, TSA's behavior detection capability was founded upon techniques and principles employed by thousands of trained security and law enforcement officers throughout the country and around the world.

In FY 2017, TSA integrated behavior detection into the standard duties of its Transportation Security Officer (TSO) workforce and eliminated the standalone Behavior Detection Officer position. This adjustment resulted in a transfer of approximately 2,660 officers and $196 million in funding to support increased passenger volume at TSA's checkpoints. Integration reflects the intent expressed in the *Federal Aviation Administration Extension, Safety, and Security Act of 2016,* as well as GAO's recommendation to limit funding for the program.[1] However, consistent with other professional security organizations throughout the world, it remains important that TSA maintains an array of capabilities for identifying adaptive adversaries looking to evade and defeat our security screening measures, as part of an overall risk mitigation strategy.

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[1] GAO, *AVIATION SECURITY: TSA Should Limit Future Funding for Behavior Detection Activities*, GAO-14-159 (Washington, D.C.: November 8, 2013).

Although GAO opines that TSA did not provide sufficient scientific validation to meet academic community standards, it should be noted that in the 2013 report from the RAND National Defense Research Institute, titled *Using Behavioral Indicators to Help Detect Potential Violent Acts: A Review of the Science Base,* the authors found that "...there is current value and unrealized potential for using behavioral indicators as part of a system to detect attacks" and "observing physiological state holds promise for detecting deception and other behaviors."

While it may be true that academic studies do not yet provide sufficient validation for certain behavioral detection techniques, there are some common-sense indicators that TSA cannot reasonably ignore, with or without academic support. For example, GAO indicates that TSA lacks scientific validation that unusual exposed wires or electrical switches on a person are an indicator of concern. But such an indicator, like others highlighted by GAO, do not need scientific validation to academic standards for inclusion in a rational and defensible security program. DHS and the Federal Bureau of Investigation (FBI), among others, have warned that hanging wires, especially around the waist, may be signs of a suicide bomber. They are the types of signposts any vigilant security professional would identify and pursue to mitigate potential threats.

Moreover, terrorist organizations provide guidance to operatives and followers on circumventing and defeating security measures. For example, in early 2015, the Islamic State of Iraq and Syria published an open-source manual designed to help traveling individuals avoid detection, titled *The Islamic State, What to Pack Up, Who to Contact, Where to Go, Stories.* The manual provides specific guidance on how an adversary should avoid looking nervous. Specifically, the manual says that an individual must "control shaking hands, rapid breathing, sweating, and avoid eye contact." The document also makes reference to having rehearsed responses if questioned by security personnel. Such attempts to mask detection are the very behavioral indicators that law enforcement and security professionals, including TSOs, are trained to detect.

Behavior detection has shown to be a successful tool in preventing individuals from circumventing airport screening. For example, in 2016 at McAllen Airport, TX, a passenger displaying high-risk indicators was engaged by officers trained in behavior detection. During questioning, the passenger admitted to transporting 4.4 kilograms of cocaine, leading to a successful arrest. While TSA does not search for narcotics during its screening process, TSOs routinely encounter individuals attempting to conceal illegal drugs with the intent to prevent detection of the drugs on their person or possessions. Techniques used by narco-traffickers to conceal drugs may also be used for more nefarious reasons by a terrorist wishing to conceal explosives. In light of threat information and evaluated intelligence, the Department is especially concerned about attempts by terrorist groups to conceal explosives in order to compromise civilian aircraft.

TSA is not the only DHS component or U.S. Government agency that uses behavior detection capabilities in conducting its mission. DHS is composed of 22 agencies, several of which leverage behavior detection. Similar to TSA, U.S. Customs and Border Protection officers use techniques to identify suspicious behavior indicators when engaging the traveling public. The Office for Bombing Prevention in the National Protection and Programs Directorate provides training to law enforcement officers and other security professionals on counter surveillance techniques. The National Counterterrorism Center, DHS, and the FBI provide joint information to first responders on behaviors that are reasonably indicative of criminal or terrorist activity. The training and information provided by these DHS and interagency partners inform and reinforce TSA's frontline behavior detection capabilities and TSO training programs.

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It is also important to note that internationally, many countries leverage behavior detection as part of their aviation security model, including Israel, Switzerland, Ireland, and France. As an active member of the European Civil Aviation Conference, Behavior Detection Study Group, TSA has partnered with several countries to establish and share behavior detection practices. For example, in April 2017, the International Civil Aviation Organization's (ICAO) added the definition of behavior detection to Annex 17, Chapter 11 of the ICAO Airport Operator Standard Security Program allowing behavior detection to be an official international security measure.

Again, thank you for the opportunity to review and comment on this draft correspondence. The Department appreciates GAO's analysis and will continue to assess ways to strengthen TSA's behavior detection capabilities. Technical comments were previously provided under separate cover. Please feel free to contact me if you have any questions. We look forward to working with you again in the future.

Sincerely,

JIM H. CRUMPACKER, CIA, CFE
Director
Departmental GAO-OIG Liaison Office

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Text of Enclosure I: Comments from the Department of Homeland Security

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June 22, 2017

Nancy R. Kingsbury, Ph.D.

Managing Director, Applied Research and Methods

U.S. Government Accountability Office 441 G Street, NW

Washington, DC 20548

Jennifer A. Grover

Director, Homeland Security and Justice Issues

U.S. Government Accountability Office 441 G Street, NW

Washington, DC 20548

Re: Management's Response to Draft Correspondence GA0-17-608R, "AVIATION SECURITY: TSA Does Not Have Valid Evidence Supporting Most of the Revised Behavioral Indicators Used in Its Behavior Detection Activities"

Dear Dr. Kingsbury and Ms. Grover:

Thank you for the opportunity to comment on this draft correspondence. The U.S. Department of Homeland Security (DHS) appreciates the U.S. Government Accountability Office's (GAO) work in planning and conducting its review and issuing this correspondence, which did not include any new recommendations.

The Transportation Security Administration (TSA) leverages behavior detection capabilities in its frontline screening workforce to complement screening technology. Behavior detection is a non- invasive technique that increases the potential of an employee to engage passengers and detect potentially dangerous individuals, terrorists, and criminals. Implemented in 2006, TSA's behavior detection capability was founded upon techniques and principles employed by thousands of trained security and law enforcement officers throughout the country and around the world.

In FY 2017, TSA integrated behavior detection into the standard duties of its Transportation Security Officer (TSO) workforce and eliminated the standalone Behavior Detection Officer position. This adjustment resulted in a transfer of approximately 2,660 officers and $196 million in funding to support increased passenger volume at TSA' s checkpoints. Integration reflects the intent expressed in the Federal Aviation Administration Extension, Safety, and Security Act of 2016, as well as GAO's recommendation to limit funding for the program. [26] However, consistent with other professional security organizations throughout the world, it remains important that TSA maintains an array of capabilities for identifying adaptive adversaries looking

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[26] GAO, AVIATION SECURITY: TSA Should Limit Future Funding for Behavior Detection Activities, GA0-14-159 (Washington, D.C.: November 8, 2013).

to evade and defeat our security screening measures, as part of an overall risk mitigation strategy.

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Jim Crumpacker

Director

Departmental GAO-OIG Liaison Office

(GAO Jobe code 101230)