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Peek or Push: An Examination of Two Types of Room Clearing Tactics for Active Shooter Event Response

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Abstract

Prior to the modern era of active shooter events, the standard training for patrol officers responding to an ongoing shooting event required the responding patrol officer(s) to contain the shooter in the building where the attack was occurring, control access to the location, attempt to communicate with the shooter, and call the Special Weapons and Tactics (SWAT) team. Recently, research has been undertaken to empirically examine different law enforcement response options. This article details one such experiment. The article details a tactic known as the peek. Utilizing an experimental design, we present findings regarding the peek room entry technique.

Keywords

police, tactics, policing, active shooter, law enforcement

Introduction

On February 25, 2016, an active shooter event began with the attacker randomly shooting vehicles on a highway in Kansas (Berman, 2016). The shooter then drove to Excel Industries (a lawn mower manufacturer) in Hesston, Kansas, entered the building, and began shooting employees. Police Chief Doug Schroeder was the first officer to arrive on scene. He immediately entered the building by himself, found the attacker, and engaged him in a gun fight. The attacker was killed but murdered three people and wounded 14 others before he died. Chief Schroeder is credited with saving many lives by preventing the shooter from incurring a higher casualty rate.

Chief Schroeder's actions illustrate a new trend in active shooter response—solo officer response. This article examines two commonly taught solo officer techniques for clearing rooms. We will refer to these as the peek and the push. Given the inherent dangers of responding to active shooter events, identifying a room entry technique that mitigates the danger to responding officers is imperative. The majority of active shooter events that police officers arrive at are still ongoing and the shooter has not been stopped or subdued (Dorfsman, 2014; Martaindale, Sandel, & Blair, 2017). First, we discuss the history and development of active shooter response in the United States.

Development of Response to Active Shooter Events

Prior to the modern era of active shooter events, the standard training for patrol officers responding to an ongoing shooting event required the responding patrol officer(s) to contain the shooter in the building where the attack was occurring, control access to the location, attempt to communicate with the shooter, and call the Special Weapons and Tactics (SWAT) team (Blair, Nichols, Burns, & Curnutt, 2013). SWAT teams—not responding officers—were expected to engage and handle the shooter.

During the shooting at Columbine High School, this is what patrol officers did. The first patrol officer on the scene engaged one of the shooters while he was outside of the building, but when the shooter retreated into the building, the first officer did not pursue. The responding patrol officers created a perimeter around the building, called for the SWAT team, and assisted victims who were on the outside of the

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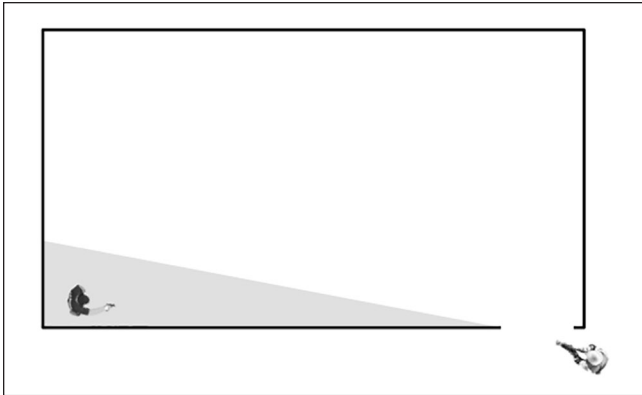


Figure 1. Blind corner of a room.

building while they waited for the SWAT team to come deal with the shooters. It took the SWAT team more than half an hour to assemble and enter the building. During this time, the shooters had free rein in the school to murder students and staff. Twelve students and one teacher were killed.

There was significant public outcry following the Columbine shooting, prompting police departments across the United States to examine their response tactics. Police departments around the country changed from expecting their patrol officers to contain violent situations and call for SWAT teams to handle the shooting, to expecting patrol officers to enter the attack location and stop the shooter(s) themselves. Relying on SWAT teams to respond and subdue the shooter is unrealistic if police departments want to save lives, which is priority in active shooter events (Doherty, 2016).

Initial training for this change in response was drawn from the training given to SWAT team officers (Blair et al., 2013). Under the guide of the initial training, patrol officers arriving on the scene were taught to form teams of four or five officers, make entry into the building where that attack was occurring, and stop the killing. Experience with actual events and the delay that waiting for four to five officers to assemble created led to additional changes in policies. Police departments began allowing officers in smaller groups of two to three person teams to make entry. However, this still created delays that the departments found unacceptable in their responses to active shooter events. Now, we are seeing police departments across the United States authorizing their officers to make solo entry to stop the killing of innocent people.

Tactics

Responding to active shooter events is dangerous, and officers are frequently shot (Blair & Schweit, 2014). In addition, some early analysis of active shooter events suggests that solo response to these events may be more dangerous than team response (Blair, Martaindale, & Nichols, 2014). Recognition of the danger inherent in the response to violent

events has led to the development of many tactics designed to help mitigate the harm.

The tactical policing community and researchers have argued that room entries are one of the most dangerous aspects of active shooter response (Blair & Martaindale, 2013, 2017; Blair et al., 2013). A room entry is defined as any time that an officer leaves an area that he or she currently controls and enters an area that he or she does not. For example, officers may be proceeding down a hallway and come to a room that might contain an attacker. When the officers leave the hallway and enter the room, they are conducting a room entry. Room entries can also include moving from the outside of a building to the inside or moving from one room to another in a series of connected rooms.

Blair and Martaindale (2013, 2017) argue that room entries are dangerous because the entering officers are moving from an area where they can see threats to one where they must expose themselves to potential new threats while simultaneously attempting to detect the threat. In addition, an attacker waiting inside of a room has an advantage in that he or she will know where the officers must enter the room (i.e., the door) and the attacker can position him or herself to try and gain an advantage against entering officers.

A variety of techniques to reduce the risks to officers when conducting room entries have been developed in recent years. Among these is threshold evaluation (or slicing the pie). This technique involves the officer moving from one side of the doorway to the other while staying in the area that he or she already controls (Blair et al., 2013), for example, moving from the left side of a door to the right side while staying in the hallway. This allows the officer to see most of a room without having to physically enter it. However, there will always be part of the room that the officer cannot see from the hallway. In the tactical policing community, this location is referred to as the blind corner or corners. Figure 1 illustrates this blind corner for a room where the door is near one of the corners of the room (referred to as a corner-fed room in the tactical policing community). If the door is in the center of the room (referred to as a center-fed room in the tactical policing community), there will be two blind corners (one on each side of the door).

Research into room entries is fairly limited and much of what has been done focuses on more than one officer performing an entry. This is because in the tactical policing community, room entries are generally performed by more than one officer. Blair and Martaindale (2013), for example, reported a series of studies that examined how the entry paths and order of entry of two officers affected the performances of both the officers and the waiting suspect. These studies found a technique they called “the hybrid” provided to be the best combination of officer speed and accuracy of fire while reducing the suspect’s accuracy of fire.

Blair and Martaindale (2017) reported on another room entry study where they examined the impact of throwing a chair into a room in an attempt to distract the attention of the



Illustration 1. The peek.

suspect away from the door of the room. This was done in response to findings in previous research (Blair & Martaindale, 2013; Blair et al., 2011) which suggested police officers were at a reaction time disadvantage when dealing with suspects in general or performing room entries. They found that throwing a chair pulled the attention of suspects away from a door and gave the entering officers a slight reaction time advantage.

Because these studies assumed that multiple officers would be entering the room, they used what we refer to as a push style entry. All of the entering officers moved completely into (pushed) the room. This allowed all of the entering officers to move into a position to engage (shoot at) the suspect should it be necessary. However, when a solo entry is being conducted, the solo officer does not necessarily need to push all the way into the room to clear the blind corner and engage a suspect. Instead, the solo officer can perform what we refer to as a peek (sometimes also called a lean). When using this technique, the officer keeps as much of his or her body as possible in the hallway and moves only his or her head, shoulders, arms, and weapon into the room (see Illustration 1). Some active shooter training programs are currently teaching this technique (e.g., the Federal Law Enforcement Training Center).

Proponents of the peek argue that the technique allows the solo officer to minimally expose him or herself to an attacker when clearing a room. A waiting suspect will only be able to see the peeking officer's upper body, and therefore the officer is provided with some "cover."¹ Proponents of the push argue that the lateral movement of the push affects the

accuracy of the suspect and can throw off his or her aim. There has also been some suggestion that the peek will cause suspects to focus their fire on the exposed parts of the officer's body, particularly the officer's hands and head, thereby producing more hits that are potentially immediately incapacitating to the officer. Proponents of the push also argue that it allows them to teach only one entry technique that can then be scaled to the number of people conducting the entry; whereas, teaching the peek requires also teaching the push for teams of officers.²

Hitting a Moving Target

Lateral movement is considered the primary advantage of the push. It is theorized that this movement decreases shooter accuracy, thus improving officer safety. Limited studies exist regarding one's ability to intercept a moving target in clinical settings, and no studies specifically address firing a weapon at a moving target. Regardless, these scholarly works lay the theoretical foundation for the peek versus push room entry study. Previous studies are focused on two primary types of object interception—that is, locomotor interception and manual interception. Locomotor interceptions refer to tasks where the individual moves her entire body to intercept a target, such as running to catch a ball or a predator chasing prey (see Chardenon, Montagne, Buekers, & Laurent, 2002; McBeath, Shaffer, & Kaiser, 1995; McLeod & Dienes, 1996). Locomotor interceptions are not considered rapid intersections that occur in fractions of seconds; therefore, locomotor interceptions utilize what is known as on-line visual information. On-line visual information can be viewed as real-time data. When running to catch a ball, the individual does not have a predetermined path to intercept the ball; rather, the individual constantly adjusts to real-time data to make the catch (Tresilian, 2005).

Manual interception refers to tasks where an individual only utilizes arm movements to intersect either a stationary or moving object. Research has shown that the underlying interception models that apply to locomotor interceptions do not apply to manual interceptions (McLeod & Dienes, 1996; Tresilian, 1995). Instead, manual interceptions utilize pre-programmed timing control models to accurately intercept either stationary or moving targets (Tresilian, 2005; Tresilian, Plooy, & Carroll, 2004). For example, an individual reaching to pick up a stationary ball would utilize a preprogrammed movement based on the location of the ball. If the ball is rolling on the floor, a preprogrammed movement can be efficiently utilized based on the estimated intersection of the ball and the hand. Tresilian (2005) argues that preprogrammed control models also explain manual interception of rapidly moving targets (i.e., <500 milliseconds). According to Tresilian (2005), when an object is moving rapidly (e.g., hitting a 90 mph fastball), the individual does not have time to receive and process visual feedback and adjust movement patterns. Rather, the individual has a preprogrammed

intersection point to attempt to contact the rapidly moving object. According to this viewpoint, if the preprogrammed intersection point is slightly off, the individual will miss the fastball.

If the response time is slightly longer, the individual can process some feedback and adjust the preprogrammed movement toward the intersection point. There are many theoretical forms of this feedback process (e.g., biphasic preprogrammed model, discrete correction model). During a biphasic preprogrammed movement, the individual makes an initial, rapid preprogrammed movement to close the distance, and then a second movement is performed based on any visual feedback to attempt to close the final intersecting distance (Tresilian, 2005). If visual feedback is blocked or unprocessed for any reason, the default response is the previously discussed preprogrammed model.

We believe the literature on hitting moving targets provides a foundation for the current research endeavor. Both the peek and the push room entry require the suspect to rapidly fire their weapon at the entering officer. As this process will occur in a fraction of a second, a preprogrammed control movement will be performed by the suspect. During the peek room entry, the officer leans into the room to engage the suspect. This movement presents the suspect with a stationary target at a predictable height. As such, the suspect's preprogrammed movement should be slight and result in an accurate shot. However, during a push room entry, the suspect is presented with rapid lateral movement by the entering officer. This rapid lateral movement will require the suspect to estimate where the officer will be and perform a preprogrammed control movement to attempt to shoot him. We believe this will result in less accurate shot placement. In addition, the officer will be slowing down once he has completed the push room entry. We believe it is possible the suspects will perform a biphasic preprogrammed movement and adjust follow-up shots on the slowing target.

Research questions. This study will attempt to unwrap the differences in both room entry styles by addressing the following research questions:

Research Question 1: Does the style of room entry (peek or push) affect the shooting accuracy of a suspect?

Research Question 2: Does the style of room entry affect where the suspect's shots hit the entering officer?

Because we will be recording these encounters and can analyze them frame by frame, we will also address an additional research question:

Research Question 3: Does the style of entry affect the reaction time of the suspect?

Method

Design

This study used a 1×2 independent groups design where participants were randomly assigned to a condition. The first condition utilized the push entry technique and was considered the control condition. The experimental condition involved the officer using the peek method of entry. Participants were unaware of the room entry technique that the officer would use. Each participant was assigned to a condition on a rotating basis.

Sample

Participants were recruited from a number of different criminal justice courses at a large central Texas university. Extra credit was offered in a variety of ways, depending on the professor teaching the class. The goal was to achieve a sample of 100 students so that each condition would have 50 participants. Fifty students in each condition would provide an approximate power of 0.80 to detect moderate differences within the t distribution ($d = 0.50$; Cohen, 1988). To ensure that the goal sample of 100 students was met, the researchers oversampled from the criminal justice courses. A total of 165 individuals completed the experiment.

Procedure

This study was conducted at a secure law enforcement facility. The participants, who played the role of murder suspect attempting to ambush responding police officers, were granted access to the facility to participate in the study. After participants signed the consent forms and filled out the demographic information, a Positive Science vision tracker was placed on them. This system utilized an eyeglass frame that houses two cameras. One camera faces the scene and records what the participant can see, while the second camera faces the right eye and tracks the participant's pupil. The eyeglass frame is connected via cable to a laptop in a backpack. The laptop contains Yabus (the software program) that allows the researcher to later sync the two camera videos with a superimposed dot that shows where the participant is looking on the scene camera. It does this based on the pupil orientation in relation to the scene camera. For the purposes of this study, we used only the scene camera to determine when the officer entered the room and when the suspect fired. The camera records at 30 frames per second. Each participant was then shown the training pistol and how it operated. Participants were then given the chance to test fire the training pistol to get the feel for its operation. This was also done as a safety measure to ensure safe firearms operations by the individuals. The training pistols were loaded with force-on-force rounds. These were primer powered rounds

that are filled with colored soap to mark where they hit. The training pistol looks and operates like an actual pistol and fires the projectiles at about 300 ft per second. The individual was then placed in the blind corner of the room. The blind corner comprises about 15% of the room's area that the police officer cannot see from the doorway. The participant was told that in this scenario, he or she is has just killed someone, is now running from the police, and has run into this corner to attempt to ambush responding officers. The participant was then given a loaded training pistol and told to face the open door where the police will be entering. Participants were told that they have one round to fire at the police, but the scenario will not begin until the proclamation of "the room is hot" to indicate that the officer can enter the room at any moment.

Once the researcher exited the room and the scenario was announced "hot," the researcher, playing the role of the officer, would then perform the assigned entry tactic. The role of the officer was played by the same researcher for both conditions, push and peek, throughout the study. For the control condition, the officer would make a hybrid, or diagonal, room entry. This type of room entry involves the officer quickly moving to the center of the room and engaging the suspect when he or she has the opportunity. Upon entering the room, the officer fires a single blank round at the participant. In the experimental condition, the officer merely peeks his head into the room with the blank gun outstretched toward the participant. He then fires a blank round while never leaving the doorway. The officer used a blank gun; therefore, participants did not require safety equipment. One reason for using blank rounds instead of the soap-filled rounds is because it is not possible to wear protective head and eye gear while also wearing the eye tracker. The officer was wearing protective headgear to ensure no harm would befall him. Once the officer and participant had fired their weapons, a cease fire was called and both individuals placed their training pistols on the ground.

After the completion of each scenario, the researcher playing the role of the officer recorded if the participant had fired his or her weapon and if the fired round had hit the researcher. In addition, the location of the hit was recorded. Cameras were used as a backup measure for determining whether the participant shot the hit location if applicable.

Results

Sample

As previously mentioned, 165 participants completed the study. There were 81 participants in the control condition and 84 participants in the experimental condition. There were some missing data for different measures. Where data were missing, the cases were excluded as the *n*'s below indicate. Ten runs in the experimental condition and eight participants in the control condition had missing data. Data could be

missing for a number of reasons including the student deciding not to participate after signing in ($n = 7$), the equipment malfunctioning ($n = 3$), the individual not firing his or her weapon at all ($n = 4$), or the individual firing his or her weapon before the officer made entry ($n = 4$). Cases with missing data were excluded, bringing the total number of participants down to 147 (74 in the experimental condition and 73 in the control condition). Of the 147 participants, 58 were female, 86 were male, and three were unknown. Forty-three percent of the sample were Caucasian, 42% were Hispanic, 11% were African American, and the remaining 4% were Asian or did not identify their race. Two participants had prior law enforcement and military experience and three had prior military experience only. The average age of the participants was 20.34 years old ($SD = 2.35$).

Hits

Research Question 1 asked if there was a difference in overall participant accuracy between the Peek and Push conditions. Participants in the Peek condition successfully shot the entering officer in 25 (33%) of the 76 usable runs. Participants in the Push condition successfully shot the entering officer in 32 (44%) of the 73 usable runs. This difference was not significant at the $p < .05$ level (Fisher's Exact test = .18) and is suggestive of a small effect size ($\phi = .11$). Research Question 1 then suggests that there is only a small (nonsignificant) difference between entry tactics in the overall accuracy of the participants.

Research Question 2 asked if there was a difference in the location of the hits on the entering officer based upon condition. Peek conditions participants hit the entering officer's head 3 times, torso 7 times, arms 7 times, and hands 8 times (See Figure 2). Push condition participants shot the entering officer in the head 3 times, torso 15 times, arm 9 times, hand 3 times, and leg 2 times. As can be seen in Figure 2, the entering officer places his hands in front of his face, which is his shooting position. This suggests the rounds that strike the officer's hands will carry through to his head. In addition, the officer's head and hands do not have ballistic protection (like a Kevlar vest for his torso). Taken together, we argue that hand and head hits are very likely to be immediately disabling for the entering officer, so we collapsed the hits into two categories. These were Head Hits (consisting of hits to the head or hands) and Other Hits (consisting of all the other hits). In the Peek condition, the participants scored 11 Head Hits and 14 Other Hits. In the Push condition, the participants scored six Head Hits and 26 Other Hits. These differences were significant at the $p < .05$ level (Fisher's Exact Test = .047, two-tailed) and suggested a moderate effect size ($\phi = .27$). The results of examining Research Question 2 suggest that there was a difference in where shots hit the entering officer by condition. Specifically, officers were moderately more likely to be shot in the head when using the Peek entry.

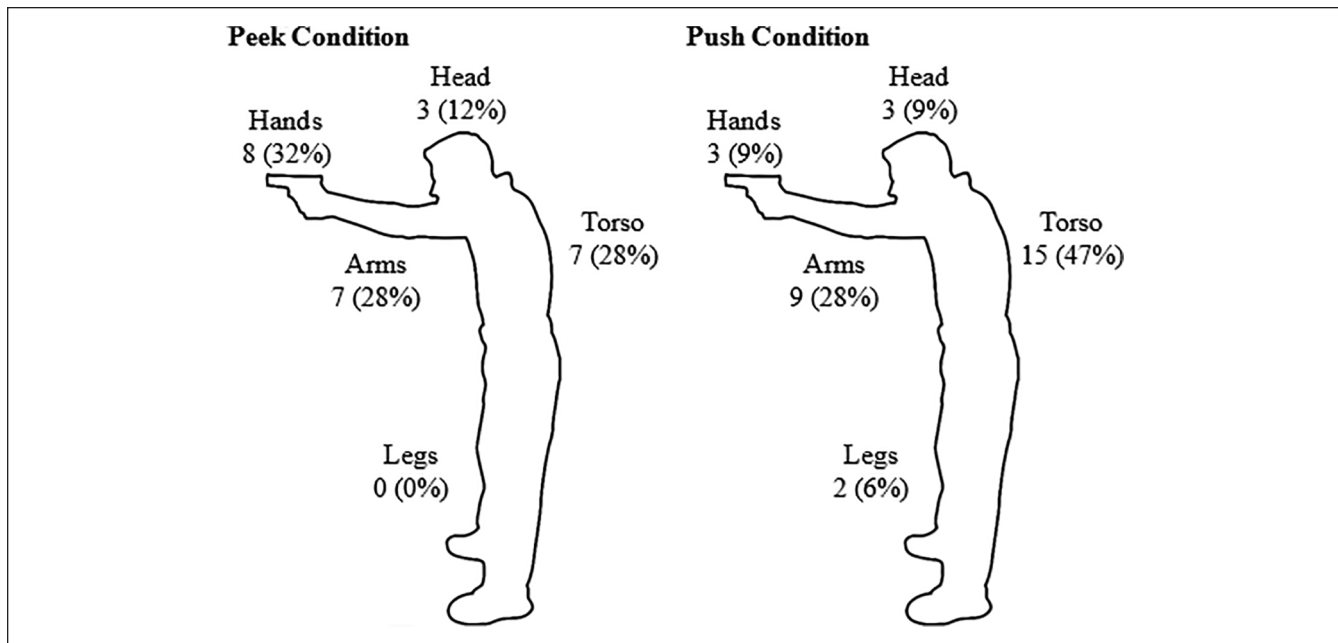


Figure 2. Hit locations by condition.

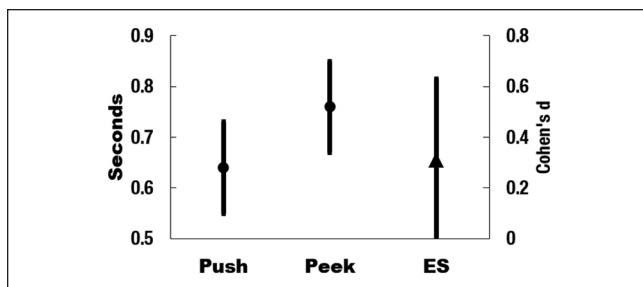


Figure 3. Reaction times and effect size (ES) with standard errors.

Reaction Time

Research Question 3 asked if there was a difference in suspect reaction time based upon entry style. As can be seen in Figure 3, the mean reaction time of the participants in the Peek condition was 0.76 s ($SD = 0.42$). The mean reaction time of the suspects in the Push condition was 0.64 s ($SD = 0.33$). This difference was not significant, $t(139.2)$ equal variances not assumed = 1.86, $p = .06$, but exhibited a moderate effect size (Cohen's $d = .31$). Although the difference was not large enough to be statistically significant, participants in the Push condition were moderately faster shooting than those in the Peek condition.

Discussion

This article examined the impact of two different room entry types on suspect accuracy: shot hit locations and reaction time. Overall, the results present a mixed picture.

Although participants hit the entering officer more in the Push condition than in the Peek condition, the difference in hits was not statistically significant and the effect size was small. Although not significant, our findings were in the opposite direction of what was suggested by research into manual interceptions. It may be that the entering officer was not moving fast enough or far enough to create a difference in the manual interception tasks between conditions. Furthermore, during a Push, the participant is presented with a full-body target while only the upper torso and head is presented during the Peek. The larger Push condition target may have inflated the shot accuracy of the participants in that condition.

In addition, the officer performing the Peek condition was moderately more likely to be shot in the head. This suggests that while officers might be shot more often in the Push condition than the Peek, when they are shot performing a peek, they are more likely to be shot in a way that is immediately disabling (e.g., shot in the head). Again, this may be a function of only the upper torso and head being visible to the participant in the Peek condition while the whole body is presented in the Push condition.

Participants in the Push condition had a moderately faster, but statistically nonsignificant, reaction time than those in the Peek condition. However, the observed reaction time difference did present a moderate effect size (Cohen's $d = .31$). Although this difference was only about one tenth of a second quicker reaction time, previous research has indicated that these small differences are often enough to determine who fires first in similar scenarios (Blair & Martaindale, 2013). This suggests that suspects in the push entry are more likely to shoot before the entering officer than suspects faced

with peek entries. It may be that the smaller target presented by the officer in the Peek condition caused the participants in this study to slow down just a little bit to aim more accurately at the smaller target. In addition, the fast reaction times in both conditions suggests that the participants were using pure manual interception (e.g., anticipating where to shoot) rather than manual interception combined with feedback or a locomotor type interception.

Given the mixed findings of this study, it is difficult to recommend one entry technique over the other. Each has strengths and weaknesses. The push may have a slight edge in that it can be used either by solo responders or a team (see Note 2).

Like any study, this one had limitations. The Force-on-Force training rounds used in this study are similar to small paintballs and will not penetrate walls. It is therefore possible that the hit rate in the Peek condition was underestimated because rounds that hit the wall in a way that would have penetrated and hit the officer (if they were actual bullets) were instead stopped. In addition, while these scenarios are considered moderately stressful, it is impossible to replicate the stress of an actual shooting situation in the laboratory. Also for the purposes of control, we only gave each suspect a single round to shoot. In an actual firefight, numerous rounds would be fired by both the participant and the officer.

Despite these limitations, we believe that this study provides important information to practitioners and policy makers about the effectiveness of two room entry types. It is our hope that this information can help protect police officers when they are performing this dangerous task.

Declaration of Conflicting Interests

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Notes

1. The term “cover” here is used colloquially. In the tactical community, “cover” refers to things that can physically stop a bullet. Typical interior walls in American construction (sheetrock and two-by-fours) will not generally stop bullets.
2. It is possible to have two officers conduct a peek using a hi-low technique; however, this technique has fallen out of favor because of incidents where the low person moved in an attempt to avoid fire and was shot in the back of the head by their partner. This is particularly a concern when discussing techniques for patrol officers who have fewer opportunities to

practice and train than SWAT personnel and also cannot be certain about the training level of the people that they are with when responding to an active shooter event.

References

- Berman, M. (2016, February 26). Kansas gunman served with restraining order just before shooting spree, police say. *The Washington Post*. Retrieved from https://www.washingtonpost.com/news/post-nation/wp/2016/02/26/kansas-gunman-served-protection-from-abuse-order-shortly-before-shootings-sheriff-says/?utm_term=.e950955e1192
- Blair, J. P., & Martaindale, M. H. (2013). *Evaluating police tactics: An empirical assessment of room entry techniques*. New York, NY: Routledge.
- Blair, J. P., & Martaindale, M. H. (2017). Throwing a chair could save officers' lives during room entries. *International Journal of Police Science & Management*, 19, 110-119.
- Blair, J. P., Martaindale, M. H., & Nichols, T. (2014). Active shooter events from 2000 to 2012. *FBI Law Enforcement Bulletin*, 7.
- Blair, J. P., Nichols, T., Burns, D., & Curnutt, J. R. (2013). *Active shooter events and response*. Boca Raton, FL: CRC Press.
- Blair, J. P., Pollock, J., Montague, D., Nichols, T., Curnutt, J., & Burns, D. (2011). Reasonableness and reaction time. *Police Quarterly*, 14, 323-343.
- Blair, J. P., & Schweit, K. (2014). *A study of active shooter incidents, 2000-2013*. Washington, DC: Federal Bureau of Investigation, U.S. Department of Justice.
- Chardenon, A., Montagne, G., Bueckers, M. J., & Laurent, M. (2002). The visual control of ball interception during human locomotion. *Neuroscience Letters*, 334, 13-16.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (Rev. ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Doherty, M. (2016). From protective intelligence to threat assessment: Strategies critical to preventing targeted violence and the active shooter. *Journal of Business Continuity & Emergency Planning*, 10, 9-17.
- Dorfsman, J. (2014). Responding to the active shooter. *Law & Order*, 62(9), 36-39.
- Martaindale, M. H., Sandel, W. L., & Blair, J. P. (2017). Active shooter events in the workplace: Findings and policy implications. *Journal of Business Continuity & Emergency Planning*, 11, 6-20.
- McBeath, M. K., Shaffer, D. M., & Kaiser, M. K. (1995). How baseball outfielders determine where to run to catch fly balls. *Science*, 268, 569-573.
- McLeod, P., & Dienes, Z. (1996). Do fielders know where to go to catch the ball or only how to get there? *Journal of Experimental Psychology: Human Perception and Performance*, 22, 531-543.
- Tresilian, J. R. (1995). Study of a servo-control strategy for projectile interception. *The Quarterly Journal of Experimental Psychology*, 48, 688-715.
- Tresilian, J. R. (2005). Hitting a moving target: Perception and action in the timing of rapid interceptions. *Perception & Psychophysics*, 67, 129-149.
- Tresilian, J. R., Plooy, A., & Carroll, T. J. (2004). Constraints on the spatiotemporal accuracy of interceptive action: Effects of target size on hitting a moving target. *Experimental Brain Research*, 155, 509-526.

Author Biographies

J. Pete Blair is the executive director of the ALERRT Center at Texas State University. His research has focused on active shooter events, police tactics, and deception detection. His research has resulted in journal publications and books. He has been invited to speak on active shooter events and police tactics by groups across the United States and internationally.

M. Hunter Martaindale is the director of research at the Advanced Law Enforcement Rapid Response Training (ALERRT) Center at Texas State University. He has published

multiple reports, articles, and a book on active shooter events and law enforcement tactics. In addition, he has presented findings from his research across the nation. He is responsible for the development and implementation of ALERRT's research agenda.

William L. Sandel is an assistant professor at Missouri State University's Department of Criminology & Criminal Justice. William specializes in active shooters, police tactics, perceptions of force, and quantitative methods. His work has resulted in multiple publications and conference presentations.