Visual training – improving your aiming accuracy

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In order to determine ways to improve aiming accuracy we first need to understand the manner in which pistol shooters use their visual skills. Research suggests that the aiming task consists of two separate components (i) a cognitive component related to determining the distance between the gun sight aiming point and the target centre and (ii) a physical component that determines the minimum margin of error for executing the aiming task. It is suggested that this second component is due to the effects of body sway and arm/hand tremor.

Cognitive requirements dictate that as expertise increases, the time for aiming or 'quiet eye' (QE), increases and the time to stabilise the pistol decreases. QE is a period of time when the gaze is stable on a spot that gives spatial information critical to effective motor performance or an accurate shot.[1] Put simply, expert shooters take more time to aim at a target and less time to adjust the pistol and arm, whereas novices spend more time adjusting their posture and less time aiming.

Research from the Korean Institute of Sports Science supports the fact that experts produce more effective results by increasing duration of QE and spending more time aligning the rear sight to the target than those less skilled. Furthermore, experts are more efficient in managing these tasks under time constraints or during periods of increased pressure such as in the rapid fire event and/or during major competitions.

The difference in performance due to levels of experience appears to lie mainly in the physical aspect of the aiming task, namely in errors caused by body sway or tremors. Learning to control body sway during the aiming and trigger phase provides the shooter with more QE, which improves aiming accuracy.[2] Further research from the Republic of China indicates that postural tremors experienced by air pistol shooters are linked to the shooter's skill and that elite shooters can maximise their control of the pistol – hand segments, which determines greater shooting success.[3] In discussing previous research, it is worth noting the research conducted by Lajie et al who looked at improving performance by decreasing forearm tremor by way of cooling the forearm using a cold pack wrapping. I bet someone reading this will try that over the weekend. Who says research is boring?

Expert shooters also appear to fix their gaze directly on the target or at a point between the target and the pistol. Conversely, less skilled shooters tend to position their gaze on the sight and follow its movement towards the target.[4] With an understanding of the visual differences of aiming between shooters of differing skill levels, coaches will have some idea of what they should be looking for and how they can guide young or inexperienced shooters towards improved performance.

Scientific research indicates that the value of visual training to improve aiming accuracy remains unclear[5,6] yet many coaches and athletes use these practices on a regular basis. Some studies show that both knowledge of results (what the shot scored) and knowledge of performance (feedback on shooters technique) have equal value in their own right and are not always required simultaneously. Similarly, another project with pistol shooters showed little difference in performances between novice shooters who receive no assistance from the coach except to see their scores, and other shooters who are provided verbal coaching support. This suggests that novices learn equally as well by simply doing and seeing the result of their shot compared to shooters with continuous coaching.

There appears to be both anecdotal and practical support for the value of visual training as a means to improve shooting performance, especially with novice shooters. In particular the fact that the actual task of shooting develops automatically and in doing so reduces the cognitive activity required and provides the shooter with more time to develop proper aiming alignment rather than control posture and arm segments.

Laser based software systems are regularly used in pistol shooting as both a diagnostic and training tool. A laser system provides excellent feedback for shooters to diagnose a sight or trigger issue. When utilising this system the shooters are provided with laser equipped pistols, given time to develop their shot to a satisfactory level and then the laser is turned on. If the laser centres on the target, the sights are properly aligned and the problem is not 'aim' based, but rather the problem is rooted elsewhere. In this case the coach can progress to drills to improve triggering and avoid the sight changing during the squeezing action.

If the laser is not centred it may be that you need to adjust the sight, the technique or both. Again, using a laser equipped pistol provides immediate and accurate feedback, which allows the shooter to correctly diagnose and then alter the shooting technique to improved accuracy.

Shooting with one or two eyes open has also been researched and the results show no effect as to whether one or two sides of the shooter's glasses are open for viewing. This suggests that shooters should simply choose the most suitable option for them rather than choose one option over another for technical reasons.

It appears that visual training can be integrated into every training session by firstly devoting to this as well as devoting time to understanding the differences between elite and novice shooters. Training sessions should provide opportunities for novices to develop the processes already learned by elite shooters. However, remember that postural control and stability is as important as the aiming process in improving shooting accuracy.

References

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