

AMATEUR BOXING COACHES PERCEPTIONS OF THE TECHNICAL COMPONENTS OF STRAIGHT PUNCHES

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Boxing coaches' experiential knowledge from a variety of environments can be used to affirm quantitative findings and shed light on areas for future investigation. Five interviews were conducted with expert amateur boxing coaches on straight punch technique in amateur boxing. Reflexive thematic analysis revealed themes regarding the contributing body segments to straight punches, including the lower body, core and upper body. Coaches identified that important components of straight punches include stepping in, rotating the rear foot, rotating the hips and pronating the hand as well as bringing the shoulder up to protect the chin. Coaches stated that straight punch technique may change when used in combinations compared to single punches. Movements identified in this study can be observed in future kinetic and kinematic analysis of punching technique.

KEYWORDS: BOXING, QUALITATIVE RESEARCH, COMBAT SPORTS, JAB, REAR CROSS, PUNCH TECHNIQUE

INTRODUCTION: There are many quantitative studies investigating the kinetic and kinematic characteristics of punches (e.g. Atha et al., 1985; Smith et al., 2000; Tong-lam et al., 2017; Walilko et al., 2005; Whiting et al., 1987). Researchers have used direct and indirect measurements on varied targets including Hybrid III head forms, pendulums and foamed targets (Atha et al., 1985; Beckwith et al., 2007; Smith et al., 2000; Walilko et al., 2005) deriving useful information on maximum punch force and identifying different methods of assessing punch kinetics, however, they have been performed in predictable environments lacking in task constraints. Alternatively, Pierce et al (2006) investigated punch kinetics via instrumented boxing gloves during six professional boxing matches. They identified punch forces similar to peak values previously recorded in laboratory environments on static inanimate objects. Pierce et al (2006) recorded higher peak punch force for a light welterweight boxer (5033 N) than a heavyweight (3554 N) and the highest mean punch force was achieved by a light middleweight (1149.2 N) and a light welter weight (1124.3 N). The authors hypothesised that punch velocity and technique play a role in punch force. However, there is a dearth of research on the technical components of punching. Lindsay & Lenetsky (2022) examined punch technique, they interviewed five New Zealand boxing coaches and discovered four higher order themes including whole body movement, footwork, hip and shoulder rotation, and hand and arm position. Lindsay & Lenetsky (2022) provide the most comprehensive breakdown of punch technique and highlight the benefits of expert boxing coaches' knowledge as it represents a wide range of environments. However, no other research has confirmed or disproved these findings, in addition the authors fail to address the nuances of punch technique in the presence of a moving opponent. Therefore, the aim of the current study was to elicit data from expert Irish boxing coaches on their perceptions of the technical components of the lead hand jab and rear hand cross in amateur boxing for comparison to previous research.

METHODS: Five expert Irish boxing coaches were interviewed via semi-structured interviews both in person and online via zoom. Ethical approval was given by the Southeast Technological University school ethics committee. During interviews, broad questions were

asked about lead hand jab and rear hand cross technique (e.g. How would you describe a rear hand punch (jab or a rear hand strike)?). Depending on the level of detail given in answers, probes were used to elicit more detail on contributing body parts and their motions during the lead hand jab and rear hand cross (e.g. What body parts contribute to the punch (e.g. legs, torso, arms, hands)?). Coaches were also asked about the effect of stylistic preferences on straight punch technique, the boxers balance during punching, sensory feedback such as sound, feeling or visual feedback and finally changes in technique during single punches or combinations. Coaches were considered as expert level if they had been coaching for a minimum of ten years and had coached at an All-Ireland level, it was labelled as essential to have an Irish Athletic Boxing Association (IABA) Level 1 qualification and desirable to have an IABA level 2 coaching qualification. Semi-structured interviews were deemed usable by following the five-step framework from Kallio et al (2016). The audio from interviews was recorded and transcribed verbatim. Transcripts were returned to participants to ensure correctness prior to analysis. Subsequently, Braun and Clarke's Reflexive Thematic Analysis was performed on the transcripts (Braun & Clarke, 2019).

Data Analysis: This study was conducted via an essentialist epistemology, interpreting transcript data at face value (Byrne, 2022). Semantic coding was primarily used when analysing interview transcripts as answers given by coaches were descriptive and probes were used to further explore the given answers, this mitigated the need to further interrogate and interpret potential meaning behind coaches' responses. Finally, an experiential orientation was taken towards the data collected as the coaches were describing their perceptions on straight punch technique and strength and conditioning. The coding was primarily inductive however, due to the nature of the questions asked in the first part of the interview, a deductive approach was used occasionally (Byrne, 2022). Data were analysed via Reflexive Thematic Analysis (Braun & Clarke, 2019) where initial open coding was carried out, subsequently themes were generated. Themes were developed when multiple coaches yielded similar codes. Themes are hierarchical, when all coaches mentioned a topic it became a higher order theme, subsequently if most coaches mentioned a topic it became a second order theme.

RESULTS: All coaches had at least an IABA level 1 qualification or equivalent and two out of five coaches had an IABA level 2 coaching qualification. All coaches had been coaching for at least 10 years with some coaches coaching for as long as 25 years. The first theme identified by Irish boxing coaches was "stepping in" when using the jab, they also identified the different types of jabs and their uses. In the context of a stiff jab with the intent of hurting the opponent, coaches described stepping in, fully extending the arm as the lead shoulder elevates and the lead hand pronates just prior to impact. Coaches said that the elevation of the shoulder helped to transfer force as well as defend the chin from counter punches. Three out of five coaches specified that the jab starts from the ground and the energy is transferred to the upper body.

Coach 3: "There are, I suppose...the biomechanics of the jab and the back hand. There's an emphasis, or there should be an emphasis on your whole body working together. Yeah, so you're like it...starts with the legs and then the hips, so it's like a wave effect coming through."

The second theme was "whole body movement", coaches reported that the rear hand cross was more powerful than the jab due to increased rotation. Coaches described rotation of the rear foot, knee flexion, rotation of the hips and thoracic region, shoulder elevation on the punching arm and pronation of the hand prior to impact.

Coach 1 "so you're bringing your heel off the ground you're dropping your knee down and that's bringing in all these muscles here. Your leg muscles are much much bigger than your arm muscles, so the power is coming up. Again, you're twisting the hand out and you're driving your shoulder forward like that, so it's all coming again, so you're getting all this power here, so you're generating it from the ground up. Again just at the sweet spot where you twist your hand, boom, that's where the power is in that punch."

Finally, a second order theme of “punch range” was identified. Four out of five coaches said that straight punch technique may change when the jab or rear cross are used in combinations. Coaches identified that punches may be thrown without full extension if trying to set up other punches or if an opponent is moving.

Coach 1: “When you hear someone outside shouting in double jab. Double jab is completely different to a single jab, because the first one is more of a range finder, because you’d never throw two hard jabs together, you’d always you kind of, with your range finder, boom, or BOOM with a hard one then a soft one afterwards. With the one two, its pretty much two hard punches, its exactly the same as the jab on its own or the right hand on its own, you’re just throwing the two together.”

Coach 5: “Yeah it will yeah, of course it will depending on how the opponent sits in front of you, it depends on how you’re transferring through your feet, how you’re transferring through that particular combination.”

DISCUSSION: These findings support previous research by Lindsay & Lenetsky (2022) that identified four higher order themes of 1) whole-body movement, 2) footwork, 3) hip and shoulder rotation and 4) hand and arm position. In the current study coaches described the need to step in with punches to move their body weight forwards, this was often seen as an essential component of a hard jab. Lindsay & Lenetsky (2022) identified the theme of footwork where coaches had described pushing off with the feet. Irish boxing coaches described the punch as starting from the ground up however, only some coaches described pushing off with the feet instead the term rotation was often used. Irish coaches did identify the importance of shoulder elevation, elbow extension and pronation of the hand prior to the punch landing in both the lead hand jab and rear hand cross. Irish coaches stated that elevation of the shoulder protects the chin from counter punches and the pronation of the hand contributes to the transfer of force in a straight punch. Conversely, Irish coaches identified changes in straight punch technique during combinations due to the movement of the opponent. This change in technique was not identified by Lindsay & Lenetsky (2022).

The contribution of the legs during both the jab and cross is supported by Cheraghi et al (2014); Filimonov (1985). Filimonov (1985) used a tensiometric dynamometer to record straight right punches from 120 boxers. They identified that more experienced boxers had better coordination between the lower limbs, core and upper body and utilised greater leg drive. Similarly, Cheraghi et al (2014) investigated punch kinetics and kinematics in eight male Iranian amateur boxers using a straight right punch to a foamed wood target with maximal intent. They identified a forward shift of the anterior superior iliac spine (ASIS) during the rear hand cross which is in line with the rotation of the hips described in the current study.

Finally Irish coaches reported that straight punch technique for both the jab and rear cross may change when used in combinations compared to singular strikes. Some coaches identified that due to having a moving target initial punches may be used to elicit responses prior to delivering a more forceful blow. Other coaches suggested that straight punches may be altered if full extension of the arms is not possible due to changing distances. Some coaches described varying the force and intent of punches within a combination. This is supported by Piorkowski et al (2011) who assessed the kinematics of 10 boxers (7 male, 3 female) when striking a striking dummy with an accelerometer while being video recorded. Piorkowski et al (2011) reported that combinations were delivered faster than single maximal force straight punches. In the current study, Coach 3 described a reduced range of motion during a four-punch combination which may account for the decreased delivery time.

This study can help coaches to analyse and teach straight punching technique when throwing single punches and combinations. Coaches described contextual factors such as the type of jabs, varying power during combinations and punching a moving opponent which will alter punching technique. These factors haven’t been mentioned in previous research and can aid

technical and tactical training for boxing coaches. Additionally, this highlights areas of importance when quantitatively investigating punches in future investigations, depending on the intent of a punch and the target, the kinetic and kinematic characteristics may change.

A limitation of the current study was the use of zoom for conducting one of the interviews. During in person interviews coaches often demonstrated the techniques they were describing which aided their descriptions, on zoom the ability to demonstrate technique was limited which may have affected the interpretation of the coaches description. Future investigations should attempt to conduct all interviews in person and may benefit from video recording to further analyse demonstrations in relation coaches verbal descriptions.

CONCLUSION: Coaches identified key technical aspects of the lead hand jab and the rear hand cross and revealed technical nuances between single punches and combinations in the presence of a moving opponent. The key body segments for straight punches are the legs, torso and upper body, with punching requiring stepping in using a whole-body movement. These data can help combat sports athletes and coaches to refine technique as well as guide future investigations into the biomechanics of striking.

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