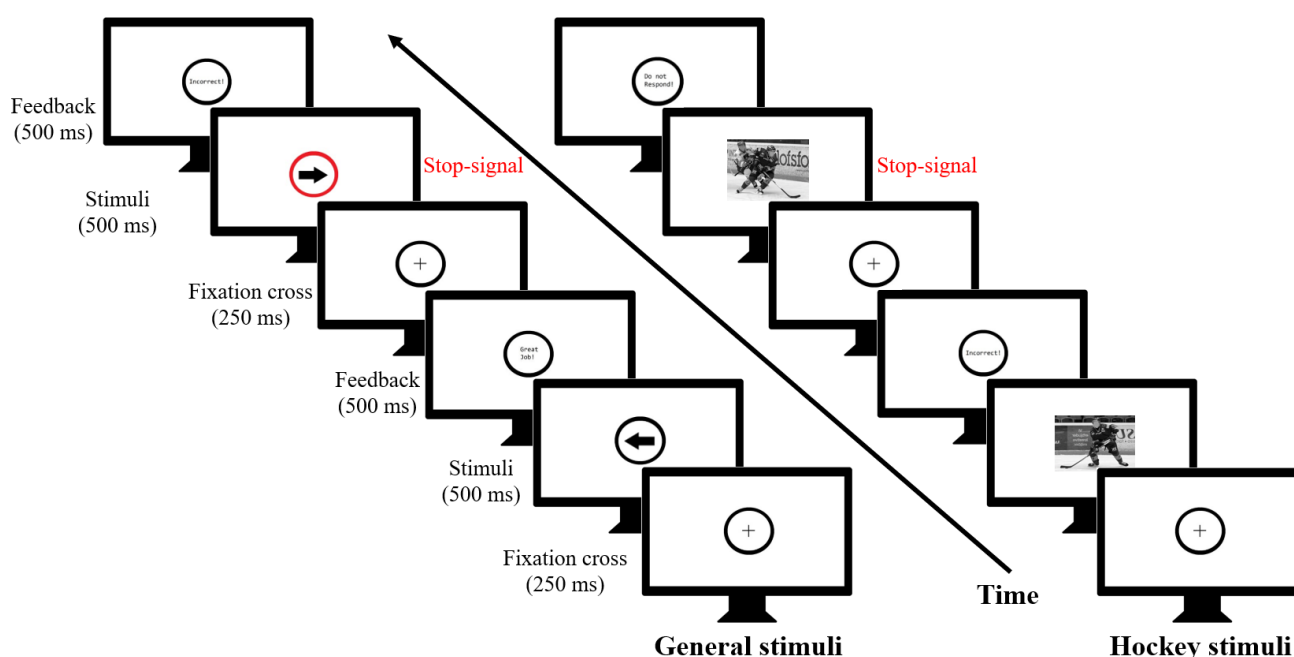


## Supplementary Material 1 for Relationships between Executive Functioning and Level of Competition in Ice Hockey SJSEP, 2026:8

The stop-signal task (Logan & Cowan, 1984) is often used as an indicator of response inhibition. In the general version of the test (available in the E-prime 3.0 Experiment Library, and further programmed into a Swedish version of the test) participants were instructed to determine the direction of a black arrow presented at the centre of a screen with a white background, one at a time. If the arrow, surrounded by a black circle, pointed to the left, the participant should press the Q key on the keyboard. If the arrow pointed to the right, the participant should press the P key on the keyboard. A fixation cross (+), also surrounded by a circle, was displayed for 250 ms, followed by the stimulus which was displayed for 500 ms.

After a response was given, the participant received instant feedback ("great job", "do not respond", or "incorrect"). In some trials, the black circle that surrounded the arrow was red (stop-signal). Under such circumstances, participants should inhibit their automatic response and not respond using the keyboard. Instead, they should wait until the next arrow appeared on the screen. The task began with 10 practice trials, followed by 150 test trials, which included stop-signal trials. In the version of the test using hockey stimuli, participants were required to determine the direction in which an ice hockey player on the ice was pointing, either to the left or the right. In some trials, an opponent stood close behind the player (stop-signal). The participant should not respond using the keyboard to the player's direction when an opponent appeared and surrounded the player.

**Figure S1. Illustration of the stop-signal task. The test that used general stimuli (i.e., arrows) is displayed on the left side. The test that used hockey-specific stimuli (i.e., players) is displayed on the right side. The arrow in the middle illustrates the timeline.**

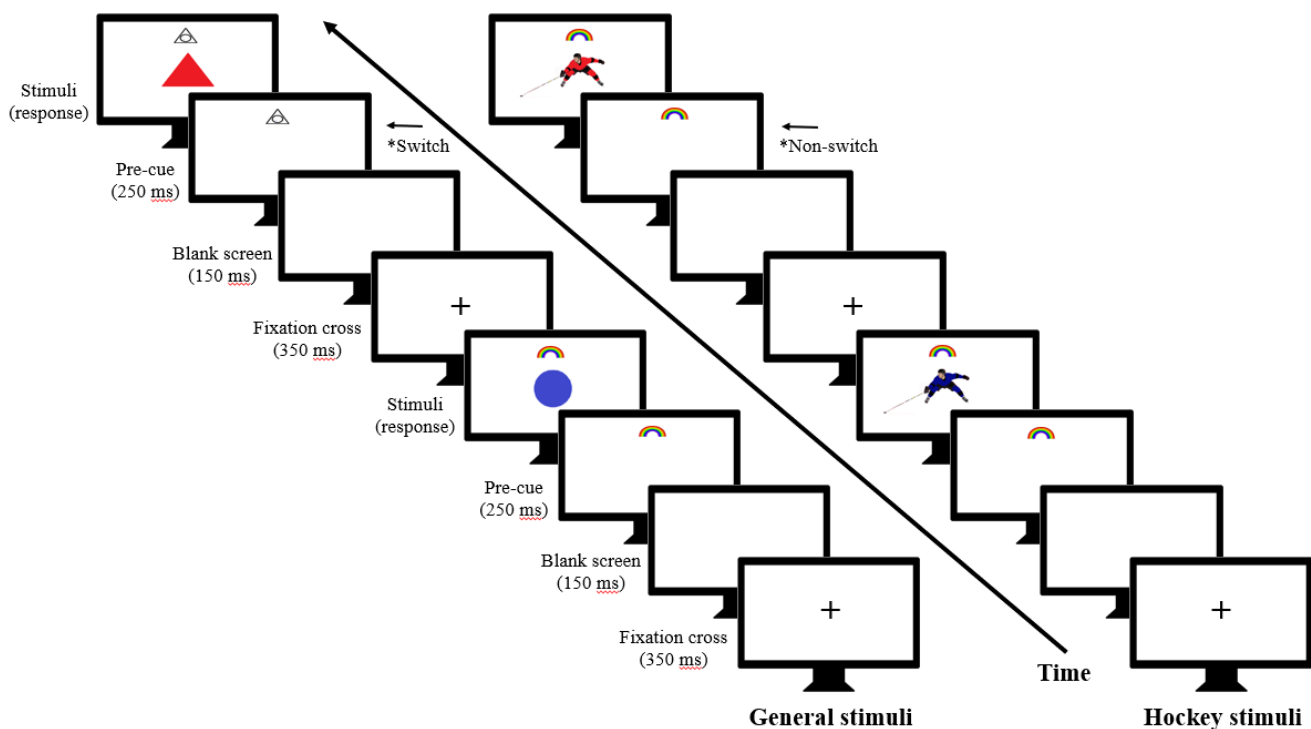


Two versions of the Color-Shape task were used to measure switching ability. The general version was based on the one used by Prior and Macwhinney (2010). For the majority of the test, participants were required to switch between determining either the colour or the shape of a figure presented at the centre of the screen (3x48 trials). However, before this mixed condition started, participants had to perform trials in which they only identified the colour of the figure (36 trials) and trials in which they only determined the shape of the figure (36 trials). Each trial began with a fixation cross presented at the centre of the screen for 350 ms, followed by a blank screen displayed for 150 ms.

In the mixed condition, the figure was presented on a white screen and could be either a blue circle, a blue triangle, a red circle, or a red triangle. Whether participants should focus on the colour or the shape of the figure was determined by a pre-cue displayed on the screen. This pre-cue, shown for 250 ms before the figure appeared, was either a rainbow, indicating that they should focus on the colour of the figure, or a black circle embedded within a black triangle, indicating that they should focus on the shape of the figure. The pre-cue remained on the screen, just above the figure, until a response was given. If participants were to focus on the colour, they pressed the Z key with their left middle finger when the figure was blue, and the X key with their left index finger when it was red. If participants were to focus on the shape, they pressed the M key with their right middle finger when the figure was a triangle, and the N key with their right index finger when it was a circle. Participants completed three mixed-task blocks, each comprising an equal number of switching and non-switching conditions, meaning that they would either switch in their categorization (e.g., from colour to shape or vice versa) or continue categorizing similarly to the previous trial (e.g., colour).

In the version with hockey stimuli, participants were required to determine either the colour or the shape (i.e., position) of an ice hockey player presented on the screen. If the pre-cue was a rainbow, participants should, similar to the general version, focus on the colour of the player (red or blue jersey). If the pre-cue consisted of arrows indicating two different directions, the task was to identify the player's position (offensive or defensive). Apart from the differences in the stimulus and one of the pre-cues, the procedure was identical to the general version of the task.

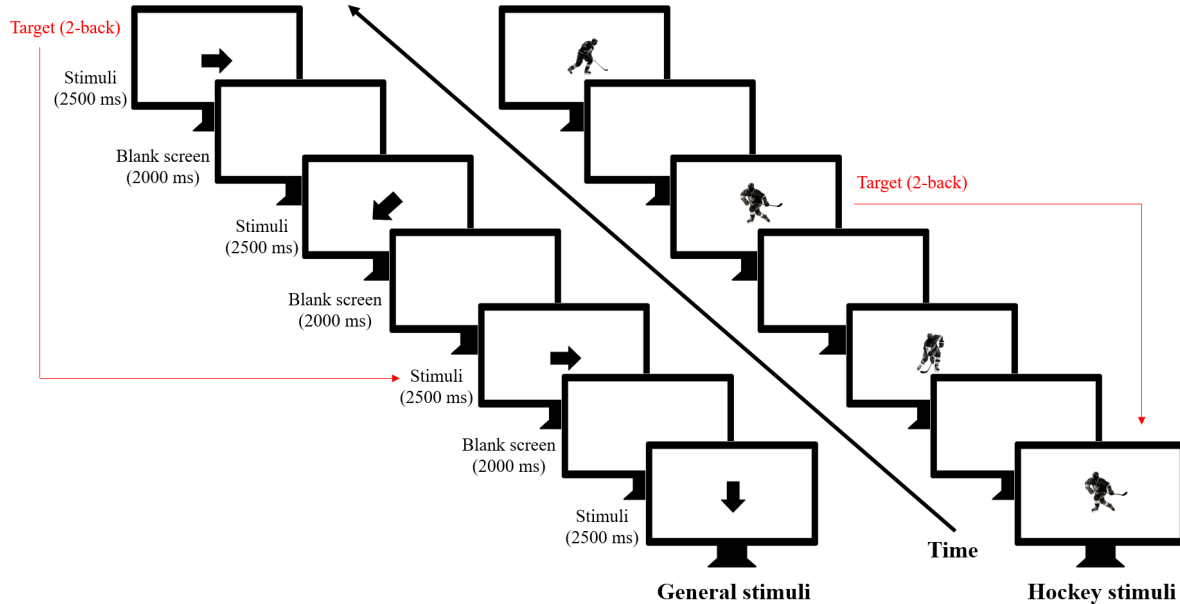
**Figure S2. Illustration of the color-shape task. The test that used general stimuli (i.e., shapes) is displayed on the left side. The test that used hockey-specific stimuli (i.e., players) is displayed on the right side. The arrow in the middle illustrates the timeline.**



The visual 2-back task was used to measure updating ability (Kirchner, 1958; see also Forsyth et al, 2021). In these two versions of the test, the task required participants to determine whether the arrow (general stimuli) or player (hockey stimuli) displayed on the screen was identical (i.e., pointing in the same direction) as the stimuli shown two steps back (2-back). If the answer was "yes," participants pressed the M key; if "no," they pressed the X key. Each stimulus was displayed for 2500 ms at the center of the screen, followed by a 2000 ms blank interval. The task started with 15 practice trials, followed by 40 test trials.

In the general version, the arrow pointed in one of five directions (left, left diagonally, straight ahead, right diagonally, right). In the 2-back task version using hockey stimuli, the stimuli consisted of an ice hockey player wearing an all-black uniform who could move in five directions (left, left diagonally, straight ahead, right diagonally, right). Apart from differences in the stimuli, the hockey version followed the same procedure as the general version. Distractors were included in both versions, meaning identical stimuli also appeared at positions other than two steps back in the sequence (non-targets).

**Fig S3. Illustration of the 2-back task. The test that used general stimuli (i.e., arrows) is displayed on the left side. The test that used hockey-specific stimuli (i.e., players) is displayed on the right side. The arrow in the middle illustrates the timeline.**



## References

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