Blinking is Linked to Our Perception of Time

By Alex Berezow — June 7, 2016

After he conquered chess, child prodigy Josh Waitzkin (whose life was featured in the movie Searching for Bobby Fischer) then became a Tai Chi Push Hands world champion, a story that he tells in The Art of Learning. In the book, Waitzkin discusses how he carefully observed his opponents and took advantage of them in brief moments of vulnerability, such as when they blinked. It seems that, perhaps unbeknownst to him, he was taking advantage of a quirk of neurobiology.

The neurotransmitter dopamine -- which is most famously associated with the "reward system" in the brain -- is also linked to eye blink rate and time perception, both of which are in constant flux. Because little is known about how natural dopamine fluctuations influence our perception of time, a team of researchers sought to discover if there is a link between eye blinks (a proxy for dopamine-related activity) and time perception. Their results are published in the journal Current Biology.

The scientists trained individuals to judge between short- and long-time intervals using either a visual stimulus (a flashing light) or an auditory stimulus (a noise burst). For instance, participants were trained that two light flashes separated by 300 milliseconds represented the "short" interval, while two light flashes separated by 700 milliseconds represented the "long" interval.

Then, they were shown flashes of light (or noise bursts) that were separated by different lengths of time, and the volunteers were asked to judge if the gap was closer in length to the short or long interval. Simultaneously, the researchers kept track of whether or not the participant had blinked during the previous trial. The team found that, if the participant had blinked, his perception of time
changed in the subsequent trial. (See figure.)

As shown above, a participant was more likely to estimate a longer time interval if he blinked (red dots) than if he did not blink (black dots). In other words, immediately after a blink, time is perceived to go by a little more slowly.

It should be noted that blinking itself does not change our perception of time; instead, blinking is perhaps indicative of changes in dopamine levels, which are linked to our perception of time.

The authors write, "[I]nterval timing ... undoubtedly influences performance variability in a variety of contexts requiring precise timing of the environment and it is closely intertwined with transient fluctuations in conscious states." This likely comes as no surprise to Mr. Waitzkin.