

Queens under threat from Kings

An analysis of girls' performances in 12 US school chess tournaments has found they tend to underperform when playing against boys. The researchers Hank Rothgerber and Katie Wolsiefer believe this is the first real-life demonstration in children of a phenomenon known as 'stereotype threat'. This is when a person fears their performance will be used to bolster stereotypes about their social group. This fear then undermines their performance.

Most examples of stereotype threat have been demonstrated in social psychology labs. This has led to concerns that the phenomenon may not be so relevant in real life, especially since some studies of real exam grades have failed to reveal any evidence of the effect.

Rothgerber and Wolsiefer first surveyed 77 female school chess players and found they were familiar with the stereotype that men are better at chess than women (a stereotype reflected in the fact that there is only one woman, Judit Polgár, in the world's top 100 chess players). Next, the researchers analysed the outcomes of chess matches played by 219 girls (aged 5 to 15) in 12 tournaments rated by the United States Chess Federation. These official tournaments provide a pre-rating for each player based on their past performances, and a post-rating adjusted in line with their tournament performance. For comparison, the outcomes of tournament matches played by 195 boys were analysed.

The girls lost more often to boys than they should have done given their and their opponents' prior skill ratings. Overall, they performed at 83 per cent of their expected success rate when playing boys. 'Evidence of stereotype threat among young children, then, cannot be dismissed merely as an artefact of, or limited to experimental paradigms', the researchers said.

Girls particularly underperformed (relative to their skill rating) when playing a male opponent with a higher rating than them (in this case they performed at 56 per cent of what was expected of them, on average); and when playing an older boy (managing an average of 73 per cent of their expected success). Younger girls were more susceptible than older girls to underperformance against boys. In contrast, there was no evidence of underperformance among the boys; in fact they often exceeded expectations.

'This reinforces our interpretation that there is something specific to the interaction between female and male competitors that produced these performance deficits in females,' said Rothgerber and Wolsiefer.

The researchers' interpretation was supported by their further analysis of the girls' participation in future tournaments. Those who underperformed more against boys in the initial analysis tended to participate in fewer future tournaments during the ensuing year, consistent with the idea that stereotype threat can encourage people to disengage from an activity when they feel threatened. This argument is made stronger by the fact that for the most part, males who did worse when playing other males did not disengage from chess any more than males whose performance exceeded expectations.

Rothgerber and Wolsiefer said their results suggest interventions to combat stereotype threat are needed at an early age. In the context of girls playing chess, they said possible remedies include providing female role models and reframing the game as a problem-solving activity.

'Whatever the method of intervention, the findings indicate that for females to fully experience the cognitive and emotional benefits of chess, the earlier the intervention, the better', they concluded.



In Group Processes and Intergroup Relations



How being happy changes your personality

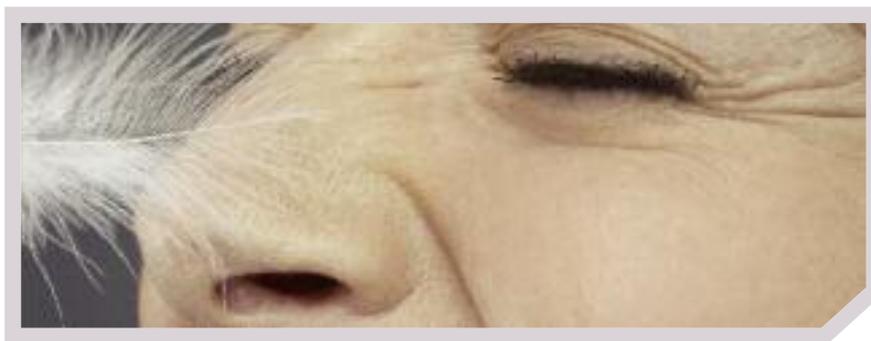
In the Journal of Personality

Outgoing, conscientious, friendly people who are open to new experiences tend to be happier than those who are more shy, unadventurous, neurotic and unfriendly. It's easy to imagine why this might be so. Barely studied before now, however, is the possibility that being happy could also alter your future personality.

Christopher Soto has conducted the first thorough study of this question. He analysed personality and well-being results for 16,367 Australians surveyed repeatedly between 2005 and 2009. He was curious to see whether personality measures at the study start were associated with particular patterns of well-being later on, and vice versa.

Soto replicated past findings for the influence of personality on well-being. But more exciting is that he found higher well-being at the study start was associated with various changes to personality. Happy people tended to become more agreeable, conscientious, emotionally stable and introverted over time. This last finding – higher well-being leading to more introversion – was opposite to what was expected, given that higher extraversion usually leads to future happiness. Soto isn't sure of the reason happier people appear to become more introverted, but he speculated it may be because they no longer need to seek out new relationships.

Looking at the size of the



You can't tickle yourself, even if you swap bodies

In *Consciousness and Cognition*

relationships between well-being and personality and vice versa over time, Soto said that both were pervasive and important but the influence of personality on well-being was 'somewhat stronger'. In both cases, the associations were modest, but Soto said we shouldn't assume they are unimportant. Any observed links are likely to be underestimated and will accumulate over time. 'Even small changes to an individual's personality traits or subjective well-being can have important consequences for the course of his or her life', Soto said.

The study has some limitations – it relied on participants' reports of their own personality and well-being (this included measures of life satisfaction; positive and negative affect). Despite the longitudinal design, it's also possible that unknown factors played a causal role, and that the mutual links between personality and well-being are correlational rather than causal. Assuming that well-being really does cause changes in personality, future research is needed to explore what the underlying mechanisms might be.

'These findings challenge the common assumption that associations of personality traits with subjective well-being are entirely, or almost entirely, due to trait influences on well-being' said Soto. 'They support the alternative hypothesis that personality traits and well-being aspects reciprocally influence each other over time.'

A popular, long-standing theory to explain the simple fact that we can't tickle ourselves is that it results from the way the brain cancels out sensations caused by its own movements. To do this, the theory states, the brain uses the motor command underlying a given action to make a prediction of the likely sensory consequences of that action. When incoming sensory information matches the prediction, it's recognised as self-generated and cancelled.

If this explanation is true, then any situations that confuse the brain's ability to predict the sensory consequences of its own actions should scupper the sensory cancellation process, thereby making self-tickling a possibility. George Van Doorn and his colleagues put this principle to the test. They measured the potential for self-tickling in 23 participants who underwent a body-swap illusion.

The experimental setup involved each participant sitting opposite the experimenter. The participant wore a pair of goggles that displayed a video feed from a camera that was either placed forward-facing on the participant's own head or forward-facing on the experimenter's head, the latter giving a view from the experimenter's perspective and provoking a body-swap illusion.

During both of these camera arrangements, the participant and experimenter each held one end of a wooden rod with foam at each end. The participant either moved the rod with their right hand, causing the foam to rub against their own left palm

(potentially causing self-tickling), and the experimenter's left palm. Or, the experimenter moved the rod, causing the foam to rub against the participant's left palm (i.e. potential for tickling by another person) and his own left palm.

During the body-swap illusion, the participants said they felt the sensation of the foam, not where their real hand was, but at the position of the experimenter's hand. Given the illusion, they perceived this to be their own hand, even though it looked like someone else's.

Crucially, even in this strange situation, participants were still unable to tickle themselves if they were the ones moving the rod (they felt the foam, but it didn't tickle). They felt much more of tickling sensation when it was the experimenter moving the rod.

The classic theory for why we can't tickle ourselves is unable to explain why tickling is still not possible in such

contexts when the brain's ability to predict the sensory outcomes of its actions is thrown into disarray. Moreover, self-tickling was still not experienced even in variations of the experimental setup, in which the body-swap illusion was combined with the 'rubber hand illusion' and the movement of the foam was felt in a baseball bat viewed from the experimenter's perspective!

Van Doorn and colleagues said their findings are consistent with an alternative neuroscience theory that's gaining currency. This 'active inference' theory states that self-generated movements cause non-specific suppression of sensory input, regardless of the accuracy of predictions of the consequences of the movements.

The researchers concluded: 'We asked "can you tickle yourself if you swap bodies with someone else?" The short answer is "no".'

I For more on body illusions, see p.176



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