

# Defeating aliens with critical thinking

Diane Halpern tells Lance Workman about her efforts to improve work-life balance and increase creativity

**You've had a very productive career, publishing widely from handedness to gender differences in cognition to developing critical thinking skills. I'd like to explore all of these, but how did you start out?**

When I first went to college at the University of Pennsylvania – we're going back a long ways – I actually started in engineering. I was interested in how things work. In my freshman year I was doing mechanical engineering and I wrote an article for the student magazine about breakthroughs in the mechanics in birth control devices. This really suggested I was studying the wrong area! At the time my then boyfriend, who later became my husband, was taking a psychology course and I sat in on a lecture and loved it. That started me off – I was hooked.

**Once you transferred into psychology were there any major figures that influenced you?**

One prominent early tutor was Henry Gleitman. He was a well-renowned psychologist but he was also an actor. He was involved in community theatre and he brought acting into the classroom in a way that made you think there was nothing more important in the world than studying psychology. Many years later I had the chance to get to know Henry on a personal level – and I was able to tell him how much he had influenced me.

**In 1995 you were one of a number of psychologists that responded to the controversial *Bell Curve* book that suggested cognitive differences between ethnic groups. Was this something you felt strongly about?**

The idea of group differences in intelligence in relation to race and ethnicity is something that has been misunderstood and misused. So I was very pleased to be involved in a rejoinder that pointed out some of the things that we felt the *Bell Curve* got wrong. Just recently I was involved in a group that updated that intelligence paper. It was

my great honour to be the only person who was on both papers. Both were really about how we conceptualise intelligence and differences here as honestly and as accurately as we can, and point out where we felt others had made mistakes.

**You are known for research into gender differences in cognition. Are there robust differences between the sexes, and if so where did they come from?**

These are complicated questions and I'm always loath to give a two-minute answer to something that is so complicated. There are some differences – some are large and some are small. And for some the contribution of biology is not zero. In other words, there is a biological contribution. But our environment certainly alters biology just as our biology alters how we construct our environment. The differences that we find today are not deficiencies – nor are they immutable. We have seen some of the size of the differences change in as little as a decade.

**Some people are uncomfortable with such ideas. Do people get moral and empirical arguments mixed up here?**

Absolutely, we have a sense of fairness. People don't like group differences of any sort – it seems unfair, un-American and un-British to suggest such things to many people. And it's true that socialisation processes are largely responsible – we certainly socialise girls and boys differently. People are often more comfortable attributing differences to socialisation processes – but there are data that suggest there are biological contributions as well. And indeed there are those who seek to misuse biological data to support sex-role stereotyping. There is no doubt that all of our advances in brain and neuroscience have re-shaped how we think about all areas of psychology. But there is considerable misuse here. I wrote a journal article several years ago titled, 'Mind the gap' which is a term that will be familiar to British readers – in this case the gap is

between mind and brain and between the differences we find in the brain and how these are somehow responsible for behaviours. We know that one of the chief architects of the brain is experience and education. I think we need to rethink the old nature–nurture dichotomy. Nature and nurture are not two independent main effects. It is really a much more interactive, circular process. Our experiences change our biology, they change the hormones we secrete, they change our brain structures and this, in turn, changes how we interact with the environment.

**You are interested in creativity. Is there anything we can do to improve our level of creativity?**

Absolutely! Most of my work is in critical thinking and I think of creativity as one aspect of critical thinking. They are not separate. All we need to do is tell a group of students that we want a creative project – try this if you are teaching right now. Give your students the freedom to be creative. You tell them that creativity is valued, and you suddenly get much more creative projects. It's really that simple. People do incredible creative projects such as, rap songs about psychology, teaching a dance as a way of enhancing memory and even baking a brain cake with ingredients that represent parts of the brain inside. I think it is a sad mistake that we aren't doing more of this and allowing our students to be creative.

**You are also interested in work-life balance. In 2005 you co-authored a book called *From Work-Family Balance to Work-Family Interaction: Changing the Metaphor*.**

This book gave me the opportunity to combine my research on work and family interaction and gender differences. My co-authors and I looked at why so few women are in top positions of leadership. One reason is of course because women have primary care responsibilities. A more recent book with Fanny Chung is *Women at the Top: Powerful Leaders Tell Us How to Combine Work and Family*. We examined powerful leaders with care responsibilities and how they manage to combine their work and family responsibilities. You can't have equality at work unless you have equality at home. I would add that most women work outside the home – and women in general have less money to hire additional help and less flexibility in scheduling tasks. The topic of combining work and family involves everybody from the CEO of an organisation to the person who sorts the mail. Men and women both want to be successful at work and good

parents and caregivers. One of the main findings is that there are tremendous benefits for men if they are more involved in their children's lives.

**One thing I'm personally interested in is handedness and abnormal patterns here (I have mixed handedness). Is this a rare phenomenon and is it true that left-handers have increased risks?**

Mixed hand use is not that unusual – you probably do some things with one hand and other things with the other. What would be unusual is if you changed these preferences for the same task, such as sometimes writing with each hand, instead of the more usual mixed hand pattern such as writing with one hand and throwing a ball with the other.

I did some early work with Stanley Coren on this – he really is one of the most knowledgeable people in the world on the topic of laterality and handedness. The idea that left-handed people have a shorter lifespan does appear to stand up quite well. It's partly because they have more accidents, largely because the world is engineered for right-handed use. We also have to take into account the fact that more males than females are left-handed and they have a shorter life expectancy. Finally, there's a small statistical association between left-handedness and being gay. This may have affected our findings because we did that work when a lot of gay men had reduced life expectancy due to AIDS. Handedness is an interesting phenomenon that is affected by, for example, circulating sex hormones during fetal development. But there are other factors involved also. Identical twins are most often discordant for handedness – probably due to crowding in the uterus

**You have been president of the American Psychological Association. That must have been a big job!**

Yes, due to the scale of the APA – it is much bigger than the BPS for example! Also, like psychologists, APA is everywhere – the APA is involved in colleges in hospitals in the military – in virtually every organisation. There is almost no place where the APA is not involved in the US.

**In the early 1990s you spent some time teaching in Russia – that must have been an unusual experience for**

**an American academic?**

It certainly was. I was a Fulbright scholar and I got to teach in Moscow State University. I was there two years after the end of communism. It was a time when everything they had learned was turned around for the people there. A time of great change.

**There must have been differences between the Russian psychologists and the way you do things in America?**

Absolutely! It was not long after the end of communism and it was a time of big transitions. I liken it to when my children were young and played the opposites game. You know the opposite of everything they said becomes true – you say you're not hungry when you really are, you roll on the floor laughing about something sad, and so on. That's what it was like when communism ended. Everything people had been taught got



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turned around – like capitalism, that suddenly became a good thing. It was a hard change. I did a book with a colleague in Russia where we compared post-communist and Soviet psychology with US psychology. We both got to work in Bellagio, Italy, on Rockefeller Fellowships. What stood out for me was that my Russian colleague kept wanting to put things together that didn't seem to go together for me. I had to understand the politics of contemporary Russia to understand his proposed grouping. Until I understood that the breakaway republics from the Soviet Union were part of prejudice, I could not understand why these topics would be grouped together conceptually. Because we don't have breakaway states in the US – although Texas comes close sometimes – I had to understand someone else's history and viewpoint to understand why that made

sense for him. But I'm always pleased to experience psychology in other cultures. I have taught in many places around the world, like Turkey, Mexico, Canada and of course Russia, because I really do believe that if you want a psychology of all people then you need to travel and get into the classroom in different places.

**Recently you developed a computerised game to help develop scientific reasoning and critical thinking.**

That's right – it's a computerised game that I developed with two colleagues, Art Graesser of the University of Memphis and Keith Millis of Northern Illinois University and it has a big team behind it. Operation ARA, which is the name of the game, teaches critical thinking by involving young people in reacting to an alien invasion. The aliens are invading the planet and are turning us into mindless consumers with no science. Your first task as a player is to join something called the 'Federal Bureau of Science'. For the first module you have an interactive textbook that was written by an alien. It's written in natural language and you respond in natural language. In the second module you play a game – a jeopardy-like game that you play with an avatar. There is an interspecies love interest. There are also twists and turns and there is a green plot. In the third module you have to identify whether someone is an alien or human. Tutoring is based on your performance. So if you do well you tutor the animated avatar, if you are middling then the avatar tutors you and if you do poorly then you mostly watch the avatar. You get to save the Earth by identifying whether an individual is a human or an alien and in the process you learn about science.

**That sounds like quite a game! As I said at the beginning, you have achieved a great deal in your career. Are there any ambitions that you would still like to fulfill and is anything you feel strongly needs to be pursued?**

There's so much! I'm very much dedicated to trying to help people think better. I think the internet and mass media in general have made bad information more easily available. A legitimate-looking website, for example, can often turn out to be a racist hate website. I increasingly think we need to be sure the general public understands why we need data, what constitutes good data and what you can do with it. That's one of the things I'm still striving to achieve.