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A complete listing of his writings at <http://kmbpsychology.jottit.com>.

# **CONTENTS**

	Page Number
<b>1. MILD BRAIN INJURY IN SPORT AND COGNITIVE ABILITIES</b>	<b>4</b>
1.1. Introduction	
1.2. Lynch and Yarnell (1973)	
1.3. Measuring cognitive abilities	
1.4. References	
<b>2. FREE WILL VERSUS PARASITE?</b>	<b>8</b>
2.1. Introduction	
2.2. Toxoplasma gondii in animals	
2.3. Toxoplasma gondii in humans	
2.4. Appendix 2A - Self-control	
2.5. References	
<b>3. PREJUDICE AND DISCRIMINATION - TWO RECENT FINDINGS FROM THE NETHERLANDS IN THE NATURE-NURTURE DEBATE</b>	<b>15</b>
3.1. Introduction	
3.2. Oxytocin	
3.3. Disordered environment	
3.4. References	
<b>4. THE KEY POINTS OF CRITICAL PSYCHOLOGY IN QUOTES</b>	<b>22</b>

# **1. MILD BRAIN INJURY IN SPORT AND COGNITIVE ABILITIES**

- 1.1. Introduction
- 1.2. Lynch and Yarnell (1973)
- 1.3. Measuring cognitive abilities
- 1.4. References

## **1.1. INTRODUCTION**

Cognitive abilities are affected by mild head injury. Attention, memory, decision-making, and rate of information-processing are such cognitive abilities that can be disrupted by sport-related head injury. In contact sports, concussion and head injury are frequent (eg: up to 10% of rugby league players; Hinton-Bayre et al 1997).

## **1.2. LYNCH AND YARNELL (1973)**

Lynch and Yarnell (1973) interviewed six college American football players, who were concussed, within thirty seconds of the injury, and then three to five minutes later, and subsequently every 5-20 minutes during the game. Memory questions included the individual's name, where he was, who the opponents were, and what happened leading up to the head injury.

Immediate recall of the injury event was accurate, but declined with time passing. For example, "One concussed player, immediately after injury, told the interviewer that he had been hit 'from the front while I was blocking on the punt'. Questioned five minutes later, he said, 'I don't remember what happened. I don't remember what play it was or what I was doing. It was something about a punt'" (p644). This is retrograde amnesia (amnesia for events just before a head injury) <sup>1</sup>.

Eight control players who suffered non-head injuries and four non-injured substituted players did not show this decline in recall of events.

This study is quoted as evidence to support the trace-consolidation theory of memory. "The theory proposes that memory for events hinges on a time-dependent process in which traces of a perception are held temporarily in a short-term memory store and slowly made permanent.." (Lynch and Yarnell 1973 p643). An

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<sup>1</sup> Two players had some recall of events after four days. But Lynch and Yarnell admitted: "Opportunity for relearning through game films and discussion could not be eliminated, however, and it is possible that these subjects did not recover memory but relearned the details of those events about which the investigators questioned them" (p644).

uninterrupted time period is needed for consolidation (ie: no brain trauma).

### **1.3. MEASURING COGNITIVE ABILITIES**

Speed of information-processing can be tested using standardised measures like the Speed and Capacity of Language Processing Test (SCOLP) (Baddeley et al 1992). This involves two sub-tests:

a) Speed of Comprehension Test (or "Silly Sentences") In two minutes, individuals have to rate as many of 100 sentences as possible as sensible (eg: "lions move around searching for food") or non-sensible (eg: "lions are made in factories"). This test involves language comprehension, rapid decision-making, visual scanning, and psycho-motor speed.

b) Spot-the-Word Test - Individuals must say which of two similar words is a real word and which a non-word (eg: "work" and "wirk"). It is predicted that performance on this test should not change after head injury because it is testing word recognition (Hinton-Bayre et al 1997).

One problem with such tests is having an individual's baseline (pre-head injury) for comparison after the head injury. This is possible, however, with professional contact sportsplayers who can be measured at the beginning of the season.

Hinton-Bayre et al (1997) reported the use of these tests with professional rugby league players in Queensland, Australia (from the Brisbane Broncos club). Ten players who had received a knock to, or rapid acceleration/deceleration of, the head, and classed as concussed, were tested. The head injuries occurred through contact with the ground or with other players. No player experienced a loss of consciousness. Assessment of the player occurred 24-48 hours after injury. Each of these players was matched with a control player.

Overall, significantly less sentences were completed in two minutes on the Silly Sentences Test after injury compared to pre-season baseline (mean 55.4 vs 67.6 out of 100; ie: 18% reduction). Individually, seven of the ten players completed fewer sentences. The performance on the Spot-the-Word Test did not change post-injury. The control players showed no changes in performance on either test between baseline and mid-season.

Working memory capacity (WMC) refers to short-term memory capacity and general "executive attention" (to focus on relevant information). The prefrontal cortex is the brain area where it is processed (Mayers et al 2011).

One test of WMC is the automated operation span

(AOSPAN) test of WMC task capability (Unsworth et al 2005). The individual is presented on a computer screen with a simple mathematical problem, and when solved a letter appears on the screen. This continues and the individual must then recall the letters presented. The WMC score is the number of letters recalled correctly.

Mayers et al (2011) compared 105 student athletes and 42 non-athletes from an American university on the AOSPAN test. The student athletes were divided into head-contact-prone (HCP) sports (eg: American football) and non-HCP sports (eg: basketball). The mean scores were compared to validation data collected by Unsworth et al (2005).

Mayers et al found no significant differences in AOSPAN scores between athletes and non-athletes, or types of athletes (HCP or not), or recently/not recently concussed, or with validation data. The researchers offered some reasons for the surprising findings:

i) Most head injuries were months or years before testing, which allowed time for healing.

ii) The sample was volunteers, and individuals with memory impairments may not have volunteered to participate.

iii) The individuals who played HCP sports may have had enhanced WMC which masked the effects of head injury. This could only be checked by comparison of individuals at pre- and post-injury.

iv) "Our findings may reflect idiosyncratic characteristics relating to the particular cohort that we studied" (p535).

Mayers et al (2011) admitted other limitations to their study:

- Large gender differences in the sample - 68 men and 37 women in the athletes group (of which 50 of 62 in the HCP sports group were male), but thirty-one of 42 non-athletes were females.
- The students were not asked about behaviours like alcohol or drug abuse that can influence WMC.
- The head injury and concussion were self-reported.
- The sample was obtained from one US university.

It is also possible that the AOSPAN test is not valid (though it is commonly used with published psychometric properties; Unsworth et al 2005).

But, in a review of studies, Mayers (2008) found that recently concussed individuals (both athletes and non-athletes) showed normal WMC performance while neuroimaging showed the same individuals had cerebral dysfunction.

Jantzen et al (2004) found no difference in digit span performance among American football players comparing their pre-season scores with a week after concussion, but neuroimaging showed the brain more active during the task post-concussion than among non-concussed individuals. So, on the surface, the individuals appeared unaffected by the concussion, but the brain was compensating "below the surface".

#### **1.4. REFERENCES**

Baddeley, A et al (1992) The Speed and Capacity of Language Processing Test: Manual Bury St Edmunds, Suffolk: Thames Valley Test Co

Hinton-Bayre, A.D et al (1997) Mild head injury and speed of information processing: A prospective study of professional rugby league players Journal of Clinical and Experimental Neuropsychology 19, 2, 275-289

Jantzen, K.J et al (2004) A prospective functioning MR imaging study of mild traumatic brain injury in college football players American Journal of Neuroradiology 25, 5, 738-745

Lynch, S & Yarnell, P.R (1973) Retrograde amnesia: Delaying forgetting after concussion American Journal of Psychology 86, 3, 643-645

Mayers, L.B (2008) Return-to-play criteria after athletic concussion: A need for revision Archives of Neurology 65, 9, 1158-1161

Mayers, L.B et al (2011) Working memory capacity among collegiate student athletes: Effects of sport-related head contacts, concussions, and working memory demands Journal of Clinical and Experimental Neuropsychology 33, 5, 532-537

Unsworth, N et al (2005) An automated version of the operation span task Behaviour Research Methods 37, 3, 498-505

## **2. FREE WILL VERSUS PARASITE?**

- 2.1. Introduction
- 2.2. *Toxoplasma gondii* in animals
- 2.3. *Toxoplasma gondii* in humans
- 2.4. Appendix 2A - Self-control
- 2.5. References

### **2.1. INTRODUCTION**

In psychology there are many underlying debates about behaviour, and one of the strongest is autonomy/free will versus determinism. Are individuals free to choose their behaviour or is it determined in some way? "Common sense and volumes of psychological and neuroscientific research reveal.. that we are less free than we think we are" (Koch 2011 p16) <sup>2</sup>.

More approaches favour some form of determinism, whether it be genetic, physiology, or the unconscious doing the causing. But few psychologists have considered that parasites might be determining the behaviour, but this may be the case with *Toxoplasma gondii* (Tg).

### **2.2. TOXOPLASMA GONDII IN ANIMALS**

Tg is an intracellular apicomplexan protozoan <sup>3</sup>. That is a parasite that survives in the cells of different hosts depending on the life cycle stage <sup>4</sup>. It is highly abundant in mammals including humans <sup>5</sup> (Webster 2007).

To survive Tg must pass through intermediate hosts <sup>6</sup> to reach the definitive host (members of the cat family, Felidae, including domestic cats), and mate within their intestines. There is interest in how Tg, which can live in the brain as small thin-walled cysts, manipulates the intermediate host in order to get to be eaten by cats (in contaminated meat).

One common intermediate host are rodents <sup>7</sup>, who have ingested the Tg shed as oocysts in cats' faeces after the parasites mate. Laboratory mice have been experimentally given Tg, and they showed reduced learning and memory of

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<sup>2</sup> It is interesting to see the autonomy-determinism debate in relation to self-control and impulsive behaviour (appendix 2A).

<sup>3</sup> This is similar to Plasmodium in malaria (Torrey and Yolken 2007).

<sup>4</sup> It is able to remain latent for long periods in intermediate hosts, though still have an effect on the host's behaviour (Flegr 2007).

<sup>5</sup> Estimates of its prevalence in humans may be as high as 80% of people, particularly with the presence of domestic cats as pets (Flegr 2007).

<sup>6</sup> In the intermediate host, schizogony occurs, where the parasite is "dormant" (Webster et al 2006).

<sup>7</sup> About one-third of wild rats have been found to be infected with Tg (Berdoy et al 2000).



a maze compared to uninfected controls (eg: Witting 1979). Furthermore, infected mice prefer exposed areas of the maze and move around a lot in the open, which is untypical of mice behaviour. It is suggested that this behaviour makes them more vulnerable to a predator (ie; cat), and thus to being eaten ("behavioural manipulation hypothesis") (Webster 2007) <sup>8 9</sup>.

Likewise, rats are usually neophobic (fear or wariness about novelty), whereas Tg-infected ones were significantly less so (ie: less cautious) than uninfected controls (eg: Webster et al 1994). Furthermore, infected rats showed a preference for areas with cat odour (as in urine), again opposite to the usual behaviour <sup>10</sup>.

Berdoy et al (2000) orally infected 23 rats via saline solution and compared them to 32 uninfected ones. Straw bedding, and food and water were placed in the four corners of a large room, but each corner had a different odour - rat's own smell, neutral smell (fresh straw), cat urine-soaked straw, and rabbit-urine soaked straw (figure 2.1). After 670 rat-hours of observation, the infected rats made, on average, twice as many visits to the cat odour corner as uninfected ones (significant at  $p = 0.0001$ ). Otherwise, there was no difference between the two groups in their number of visits to the other corners.

Webster (2007) concluded: "These results suggested a significant divergence in the perceived response to cat predation, where uninfected rats show a significant and innate avoidance of cat-scented areas while infected rats show a significant, potentially suicidal, preference for cat-treated areas" (p753) <sup>11</sup>.

In further experiments, infected rats given anti-psychotic medication (eg: haloperidol) (which inhibits replication of Tg), returned to their usual cat-fearful and neophobic behaviour (Webster et al 2006).

Webster et al (2006) orally infected 49 rats (with 39 controls). All the rats were divided into eight groups - infected/uninfected, and one of three substances given - pyrimethamine (anti-Tg treatment), haloperidol, and valproic acid (mood-stabiliser), and a water control (table 2.1). The drugs were given for fourteen days after 14 days of Tg exposure.

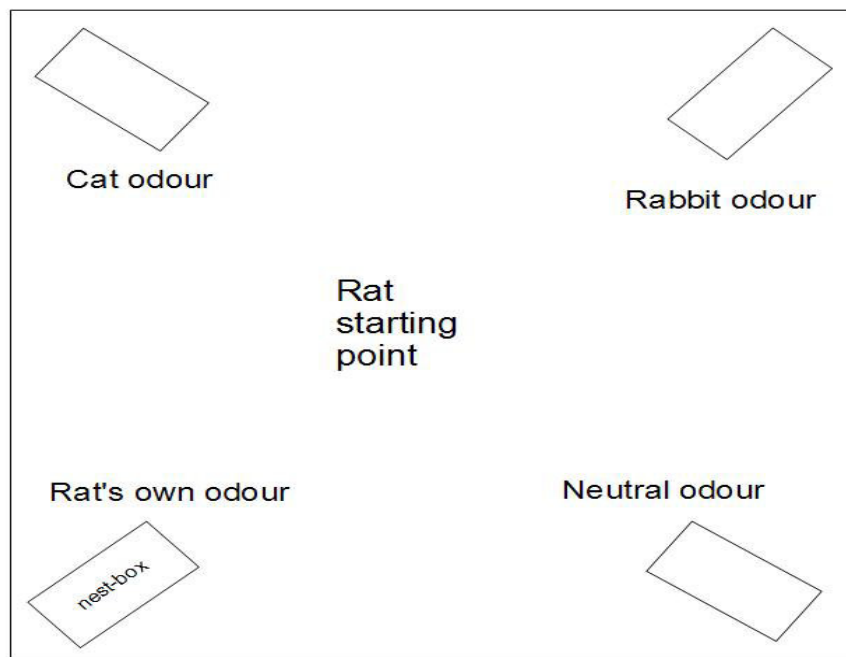
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<sup>8</sup> But competition for mates and social status is unaltered (Berdoy et al 2000).

<sup>9</sup> The parasitic worm, *Echinorhynchus truttae* infects fish (intermediate host) and increases the respiration rate, thereby forcing the fish to swim to the surface and to more oxygenated water, and increasing the likelihood of predation by a raptor (definitive host) (Vyas and Sapolsky 2010).

<sup>10</sup> This behaviour is not due to olfactory problems (ie: smell inhibited by Tg) because the rats still show an aversive response to novel odours (and foods) (Vyas and Sapolsky 2010).

<sup>11</sup> Interestingly, Tg is more prevalent in the amygdala (the brain area linked to fear) than other brain areas, and it contains two genes related to mammalian genes involved in regulation of dopamine (associated with reward in the brain) (Koch 2011).



(Based on Webster et al 2006 figure 1 p1026)

Figure 2.1 - Lay-out of experimental room used by Berdoy et al (2000).

Firstly, the response of the rats in a room with different odours in each corner was established (as in Berdoy et al 2000) in ten-second observation blocks during four hours of observation. Compared to uninfected rats, the infected ones spent nearly twenty times longer in or near the corner of the room containing cat odour.

When given the drug, the infected rats were less likely to enter the "cat area", but, if they did, they stayed for less time on haloperidol and pyrimethamine than infected rats given water.

	Water	Pyrimethamine	Haloperidol	Valproic acid
Tg-infected	1	2	3	4
Uninfected	5	6	7	8

Table 2.1 - Groups in Webster et al (2006) experiment.

In terms of the physiology of how Tg controls the rat's behaviour, the exact mechanism of action is unclear, but neurotransmitters are involved. For example, experimental alteration of serotonin levels has produced rat behaviour that is fearless of cat odours (Webster

2007).

The changing of host behaviour by Tg has also been reported among infected otters in the wild, whose consequent abnormal movements make them more likely to be predated by sharks (though Tg cannot develop in a shark) (eg: Kreuder et al 2003).

### 2.3. TOXOPLASMA GONDII AND HUMANS

If Tg can alter the behaviour of rodents, does it have an effect on human hosts? A series of studies in the Czech Republic since the 1990s led by Jeroslav Flegr have found significant differences on personality questionnaires between individuals known to be Tg-infected and those not. For example, on Cattell's 16-PF questionnaire, infected individuals are different on "superego strength" (factor G) which refers to moral rule obedience. Low scorers disregard rules and are a "law unto themselves", while high scorers are more rule-abiding and conscientious. Interestingly, Tg-infected men were more likely to be the former than non-infected ones, while infected women were the latter (Flegr 2007).

But these relationships are correlations, and the personality characteristic may cause the behaviour that leads to infection rather than the infection causing the personality characteristic. A correlation shows a two-way relationship, not the direction of the relationship (as in an experiment). Correlations can also be spurious. For example, infected individuals have lower verbal IQ scores, but this is a product of greater infection rates in rural areas in developing countries with lower education levels, and this accounts for the lower IQ score (Flegr 2007).

In terms of behaviour, Flegr et al (2002) analysed the blood for Tg of 146 individuals <sup>12</sup> in Prague who were responsible for a motor vehicle accident as a driver or a pedestrian. Tg-infected individuals were twice as likely to have such an accident (odds ratio 2.65) <sup>13</sup> <sup>14</sup> (though confounding variables could not be ruled out; Flegr 2007). This finding has been confirmed in Turkey (Yereli

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<sup>12</sup> Blood samples of 85 men and 61 women involved in a traffic accident between 1997-2000, who attended the Surgery Unit of a central Prague hospital and compared with 230 men and 216 women selected by quota sampling in central Prague.

<sup>13</sup> Individual odds ratios - men 2.71, women 2.68, all 15-29 year-olds 3.07, 30-44 year-olds 1.95, 45-59 year-olds 2.39, and 60-70 year-olds 3.16 (Flegr et al 2002).

<sup>14</sup> Tg-infection rates based on age were: 15-29 year-olds 15.3% (controls)/35.6% (traffic accident), 30-44 year-olds 22.4%/36.0%, 45-59 year-olds 24.4%/43.6%, and 60-70 year-olds 22.5%/47.8% (Flegr et al 2002).

et al 2006)<sup>15</sup>.

In evolutionary terms, the ability of Tg to influence rodent behaviour makes sense, but "humans are dead-end hosts for *T.gondii*, because the chances that a human being will be eaten by a feline are infinitesimally small" (Flegr 2007). But, Flegr (2007) argued, our primate ancestors would have been eaten by large cats, and "parasites are not aware that they have entered dead-end hosts, so they are likely to exert whatever effects they do in any host" (p758).

On the other hand, the change in human behaviour may be the product of the presence of an invader in the brain rather than the manipulation of the host by the parasite (Flegr 2007).

Most interest (and controversy) in Tg in humans is in relation to schizophrenia. Blood samples of mothers before and after giving birth showed significantly higher Tg antibodies (a sign of Tg presence now or in the past) whose children developed schizophrenia as adults than mothers of children who do not, and first-episode schizophrenics had significantly more Tg antibodies in their blood than controls (Webster et al 2006).

In the case of the latter finding, Torrey et al (2007) reported a meta-analysis of 23 studies<sup>16</sup> with a total of 3873 individuals with schizophrenia and 7046 controls from five decades in seventeen countries. This produced an odds ratio of Tg infection of 2.73 for schizophrenia, and 2.54 for "first-episode" schizophrenia.

However, Torrey et al (2007) wondered why in countries where the rate of Tg infection was high (eg: France, Ethiopia) due to eating uncooked or raw meat, schizophrenia was not higher in these countries.

Torrey and Yolken (2007) noted that it was difficult to detect Tg in the brains of individuals with schizophrenia, and, furthermore, why most individuals with Tg did not develop schizophrenia. The answer to question, Torrey and Yolken said, was related to the timing of the infection, the strain of the infection, and the genetic make-up of the infected person.

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<sup>15</sup> It has been proposed that Tg slows down reaction times in order to make rodents vulnerable to predation, and this is a by-product in humans (Flegr et al 2002).

<sup>16</sup> Nineteen studies were excluded because of including patients with other mental disorders than schizophrenia, or not using an appropriate test for Tg, or having no control group, or a biased selection of participants.

#### 1.4. APPENDIX 2A - SELF-CONTROL

Self-control can be defined as "the exertion of willpower in the interest of long term objectives" (Hofmann and Friese 2011 p44).

Fritz and Deutsch (2004) described self-control as the outcome of impulses against reflection. These are two different information-processing systems in the brain (dual-system model). The impulsive self seeks pleasurable stimuli and relies on habits (which vary from individual to individual), while reflective thought uses reasoning and planning (which is resource-demanding).

Because the reflective part needs mental resources, activities that are demanding can reduce the resistance to impulses (known as ego-depletion; Hofmann and Friese 2011). For example, individuals undergoing a job interview (demanding task) were more likely to succumb to the temptation of fast food afterwards (when trying not to) than individuals not involved in such tasks (Hofmann and Friese 2011).

Alcohol can reduce self-control. Hofmann and Friese (2011) reported an experiment about resisting eating chocolate when hungry with participants who had drunk about half a pint of vodka or orange juice fifteen minutes beforehand. The orange juice-drinkers consumed less chocolate (ie: could resist temptation) than the vodka-drinkers.

In terms of achieving goals, like losing weight or giving up smoking, techniques can be used to aid self-control. For example, "implementation intentions" (Gollwitzer 1999) involves teaching "if-then" strategies to individuals, which are practised (eg: if I am hungry while on my diet, then I will eat celery not cake), or consistent repetition. This is repeating resistance behaviour until it becomes a habit. Wiers et al (2010) reported that alcoholics, who repeatedly signalled rejection when a picture of an alcoholic drink appeared on a screen, had a lower relapse rate one year later than controls.

#### 2.5. REFERENCES

Berdoy, M et al (2000) Fatal attraction in rats infected with *Toxoplasma gondii* Proceedings of Royal Society B 267, 1591-1594

Flegr, J (2007) Effects of *Toxoplasma* on human behaviour Schizophrenia Bulletin 33, 3, 757-760

Flegr, J et al (2002) Increased risk of traffic accidents in subjects with latent toxoplasmosis: A retrospective case-control study BMC Infectious Diseases 2, 11

Gollwitzer, P (1999) Implementation intentions: Strong effects of simple plans American Psychologist 54, 7, 493-503

- Hofmann, W & Friese, M (2011) Control yourself Scientific American Mind May/June, 42-47
- Koch, C (2011) Fatal attraction Scientific American Mind May/June, 16-17
- Kreuder, C et al (2003) Patterns of mortality in southern sea otters (*Enhydra lutris nereis*) from 1998-2001 Journal of Wildlife Diseases 39, 495-509
- Strack, F & Deutsch, R (2004) Reflection and impulsive determinants of social behaviour Personality and Social Psychology Review 8, 220-247
- Torrey, E.F & Yolken, R.H (2007) Editors' introduction: Schizophrenia and toxoplasmosis Schizophrenia Bulletin 33, 3, 727-728
- Torrey, E.F et al (2007) Antibodies to *Toxoplasma gondii* in patients with schizophrenia: A meta-analysis Schizophrenia Bulletin 33, 3, 729-736
- Vyas, A & sapolsky, R (2010) Manipulation of host behaviour by *Toxoplasma gondii*: What is the minimum a proposed proximate mechanism should explain? Folia Parasitologica 57, 2, 88-94
- Webster, J.P (2007) The effect of *Toxoplasma gondii* on animal behaviour: Playing cat and mouse Schizophrenia Bulletin 33, 3, 752-756
- Webster, J.P et al (1994) Effect of *Toxoplasma gondii* on neophobic behaviour in will brown rats, *Rattus norvegicus* Parasitology 109, 37-43
- Webster, J.P et al (2006) Parasites as causative agents of human affective disorders? The impact of anti-psychotic, mood-stabiliser and anti-protozoan medication on *T.gondii*'s ability to alter host behaviour Proceedings of the Royal Society B: Biological Sciences 273, 1023-1030
- Wiers, R.W et al (2010) Retraining automatic action-tendencies to approach alcohol in hazardous drinkers Addiction 105, 2, 279-287
- Witting, P.A (1979) Learning capacity and memory of normal and *Toxoplasma*-infected laboratory rats and mice Zeitschrift fur Parasitenkunde 61, 29-51
- Yereli, K et al (2006) Is *Toxoplasma gondii* a potential risk for traffic accidents in Turkey? Forensic Science International 163, 34-37

### **3. PREJUDICE AND DISCRIMINATION - TWO RECENT FINDINGS FROM THE NETHERLANDS IN THE NATURE-NURTURE DEBATE**

- 3.1. Introduction
- 3.2. Oxytocin
- 3.3. Disordered environment
- 3.4. References

#### **3.1. INTRODUCTION**

Prejudice and discrimination are behaviours that are explained in different ways by different theories. Without going into detail about the theories, they can usually be divided into nature explanations (which emphasise the innate aspect of the behaviour) or nurture explanations (which see behaviour as learned in some form and/or due to the environment).

#### **3.2. OXYTOCIN**

The nature side of the argument includes evolutionary explanations. It is suggested that ingroup favouritism and outgroup distrust/discrimination (which are core to prejudice) evolved in early human groups as a way to guard against exploitation by freeriders. This is also summarised with the term "ethnocentrism" - "the tendency to view one's group as centrally important and superior to other groups" (De Dreu et al 2011a).

De Dreu et al (2011a) proposed that the evolutionary mechanism behind ethnocentrism is oxytocin<sup>17</sup> produced in the hypothalamus and active in the hippocampus and the amygdala in the brain. It functions as both a neurotransmitter and a hormone.

In five experiments, Dutch men<sup>18</sup> receiving oxytocin or a placebo were tested for signs of ingroup favouritism and outgroup discrimination by De Dreu et al (2011a). In total, 280 participants were recruited online by the researchers, at the University of Amsterdam in the Netherlands, under the pretext of a study about the effects of medication on decision-making. The oxytocin or placebo were administered nasally (three puffs) forty minutes before the experimental tasks.

Experiments 1 and 2 used the Implicit Association

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<sup>17</sup> Oxytocin is seen as encouraging trust, co-operation, and social bonding (Weaver 2011).

<sup>18</sup> The researchers did not say why only men were recruited for the experiments.

Test (IAT) <sup>19</sup> to assess implicit attitudes towards the ingroup (Dutch) and two outgroups (Arabs in experiment 1 and Germans in experiment 2). The IAT tests reaction time to associated words with the different groups. Individuals showing ethnocentrism will be quicker to react when positive words are paired with the ingroup and negative words with the outgroup than the other way around. In both experiments, the oxytocin groups showed such a faster reaction time than the control groups.

In experiment 3, participants had to rate, on a five-point scale, whether Dutch or Muslim individuals experienced uniquely human emotions, like embarrassment, hope or admiration. The oxytocin group attributed such emotions more to the ingroup than to the outgroup than the placebo group. This form of discrimination is called "infra-humanisation" ("the tendency to associate ingroup members more than outgroup members with secondary emotions that are commonly seen as uniquely human.. as opposed to primary emotions like joy and sadness" (De Dreu et al 2011a)).

Experiments 4 and 5 investigated ethnocentrism in relation to the Moral Choice Dilemma Test. Three dilemmas were devised which focused on the choice of killing one person to save five:

- A train (or trolley bus <sup>20</sup>) is heading uncontrollably towards five people, but hitting a switch will divert it and hit one person.
- Blowing up one person in a hole in a cave in order to allow five other people to escape.
- To stop one person from boarding a lifeboat to prevent it sinking with the five people already aboard.

There were also two control dilemmas - choosing one of two roads to take, and choosing coffee or milkshake.

The individual in the dilemmas who would die to save the five was given typical names - Dutch (eg: Dirk), Arab (eg: Ahmed) in experiment 4, and German (eg: Helmut) in experiment 5, but the five were nameless. It was predicted that ethnocentric individuals would be less willing to sacrifice an ingroup member to save the nameless group and more willing to sacrifice an outgroup member.

The oxytocin groups were more likely to sacrifice an outgroup individual than an ingroup one, whereas the placebo group showed no difference based on apparent

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<sup>19</sup> The IAT has been criticised for not providing conclusive evidence about an individual's views or beliefs (Chen et al 2011).

<sup>20</sup> Sometimes known as the "trolley dilemma".



nationality of the individual.

In many ways, the experiments by De Dreu et al (2011a) showed ingroup favouritism (or ingroup love-prejudice effect; Allport 1954) was enhanced by oxytocin rather than outgroup discrimination (or outgroup hate-prejudice effect; Allport 1954) being increased. Outgroup discrimination was almost a by-product of the enhanced ingroup favouritism and preferential treatment of those individuals. De Dreu et al (2011a) concluded that "oxytocin functions to strengthen an evolutionary evolved and rather functional tendency to discriminate between ingroup and outgroup as well as to give members of one's own group preferential treatment. Such ethnocentrism has adaptive value to individuals and their groups but, unfortunately, also paves the way for intergroup bias, conflict, and violence".

Chen et al (2011) challenged this interpretation of the findings. They argued that oxytocin "simply enhances the cognitive availability of salient information in the social environment, such as widespread stereotypes". Furthermore, they said, "Goodwill is not a fixed pie, and increased goodwill to ingroup members does not necessarily imply any change in goodwill to outgroup members. In fact, the authors' own evidence that oxytocin promoted ingroup favouritism but not outgroup derogation supports the idea that these two tendencies are distinct" (pE45). Finally, the experiments needed a comparison group who received another hormone, like vasopressin.

De Dreu et al (2011b) replied that "because oxytocin promotes ingroup favouritism and intergroup bias, oxytocin indirectly contributes to intergroup tension, conflict, and perhaps, even violence. Goodwill is not a fixed pie, but oxytocin-induced goodwill is limited to one's in-group and not extended to out-groups" (pE46).

### **3.3. DISORDERED ENVIRONMENT**

An example of the nurture side of the argument can be seen in the idea that a physically disordered environment (eg: litter on the street) can lead, indirectly, to prejudice and discrimination. The physical disorder increases the need for structure and order, which produces a reliance on stereotypes and highly simplified categories, and subsequently, prejudice and discrimination, argued Stapel and Lindenberg (2011): "Seen in this light, stereotyping is a way to cope with chaos, a mental cleaning device in the face of disorder"

(p251) <sup>21</sup>.

Stapel and Lindenberg (2011) tested this idea with two field experiments and three laboratory experiments.

### 1st Field Experiment

The researchers used the opportunity of a strike by cleaners at Utrecht train station in the Netherlands, which lead to a dirty and disordered environment <sup>22</sup>, to question forty White commuters about their attitudes towards certain groups (Muslims, homosexuals, and the Dutch). They were asked on a nine-point scale whether certain traits applied to each group (table 3.1). To fill out the questionnaire, the participants were instructed to sit on one of six chairs in a row, of which the first chair was taken by a young Black (Dutch-African) or young White (Dutch) man. How close the participants sat to this man (confederate) (scored as 0-4 chairs away) was taken as a measure of prejudice (based on the idea that greater distance equals greater prejudice). This was the dependent variable, while the independent variable was the confederate being Black or White. A week later, after the strike was ended and the station was cleaned, control groups were run.

GROUP *	POSITIVE	NEGATIVE
Muslims	Hardworking Loyal	Aggressive Intolerant
Homosexuals	Creative Sweet	Strange Feminine
Dutch	Tolerant Transparent	Stingy Rude

(\* All groups were offered neutral traits: impatient and intelligent)

Table 3.1 - Traits offered for the different groups.

During the disordered condition, attitudes were more stereotyped on the questionnaire than during the ordered condition (total mean: 5.12 vs 4.28 out of 9), and individuals sat significantly further away from the Black confederate (mean: three vs two chairs away). The distance away from the White confederate was not different in the ordered and disordered conditions (mean:

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<sup>21</sup> It could be argued that this need for order is an innate drive.

<sup>22</sup> The participants were asked about their perception of the environment with the statement, "I think this train station leaves a.", (1) chaotic impression, to (9) organised impression. The mean scores were 4.33 in the disordered condition and 5.46 in the ordered condition.

2.25 chairs away).

## 2nd Field Experiment

On a street in an affluent area in another Dutch city, 47 passersby were asked to complete the stereotype questionnaire in exchange for five Euros. This time the researchers manipulated the environment by putting a badly parked car, an abandoned bicycle, and misplaced pavement tiles around the area. The measure of discrimination was the willingness of the respondents to donate any of their five Euros gained to "Money for Minorities" to help minority groups. A control condition was performed with a neat environment. Again, individuals in the disordered condition scored higher on the stereotype questionnaire (total mean: 5.07 vs 4.29), and gave significantly less money to the charity than the ordered condition (mean: 1.70 vs 2.35 Euros).

## 1st Laboratory Experiment

In this experiment 47 students were shown four pictures to memorise. They were shown either disordered scenes (eg: bookcase with chaotically stacked books), ordered scenes (eg: bookcase with nicely stacked books), or were neutral (eg: chair). This was the independent variable. The dependent variable was measured by the stereotype questionnaire, and the personal-need-for-structure scale (with items like, "I do not like situations that are uncertain"). The mean scores on both questionnaires were significantly higher after viewing the disordered scenes than the other two conditions.

## 2nd Laboratory Experiment

Fifty-eight students were used to test the effect of unconscious exposure to disorder. While performing a vigilance task which involved pressing different keys depending where a flash appeared on the computer screen<sup>23</sup>, words were presented outside of awareness (ie: faster than the individuals could consciously perceive - 80 ms). The words were either related to disorder (eg: anarchy), order (eg: neat), or neutral (eg: table). The same two questionnaires were used as in the previous experiment, and the findings were the same.

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<sup>23</sup> Press "L" if the left side of the screen and "R" if the right side.

### 3rd Laboratory Experiment

This experiment tested the effect of abstract disorder with 66 more students. Disorder was created by showing the participants a sheet of paper containing circles, squares, and triangles chaotically on the page, while they were neatly spaced to create order. The findings on the two questionnaires were similar to the previous two experiments.

Table 3.2 summarises the independent and dependent variables in the five experiments.

EXPERIMENT	INDEPENDENT VARIABLE	DEPENDENT VARIABLE
1st field	1. Ethnicity of confederate on seat. 2. Station ordered or disordered.	1. Stereotype questionnaire. 2. Chair chosen in relation to confederate (ie: distance).
2nd field	Street ordered or disordered.	1. Stereotype questionnaire. 2. Amount of money given to charity for minorities.
1st laboratory	Pictures of ordered, disordered or neutral scenes.	1. Stereotype questionnaire. 2. Personal-need-for-structure scale.
2nd laboratory	Words presented very fast - related to order, disorder or neutral.	1. Stereotype questionnaire. 2. Personal-need-for-structure scale.
3rd laboratory	Abstract drawing - ordered or disordered.	1. Stereotype questionnaire. 2. Personal-need-for-structure scale.

Table 3.2 - Summary of variables in five experiments by Stapel and Lindenberg (2011).

Stapel and Lindenberg (2011) concluded that "people are very sensitive to their experience of disorder". Environments perceived as disordered encourage stereotyping as a means to apply (cognitive) order (ie: the need for structure) more than ordered environments <sup>24</sup>. They called this the "disorder-to-stereotyping effect".

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<sup>24</sup> It is possible that "cognitive load" is increased in a chaotic environment and this leads to the use of stereotyping. In the Supplementary Online Material, Stapel and Lindenberg (2011) reported a "cognitive load" version of the first laboratory experiment where participants had to remember a nine-digit number while viewing the pictures. The effect on stereotyping after viewing disordered pictures was not as strong as the need for structure, so the researchers dismissed this idea.

### 3.4. REFERENCES

Allport, G.W (1954) The Nature of Prejudice Cambridge, MA: Addison-Wesley

Chen, F.S et al (2011) Oxytocin and intergroup relations: Goodwill is not a fixed pie Proceedings of the National Academy of Sciences, USA 108, 13, E45

De Dreu, C.K.W et al (2011a) Oxytocin promotes human ethnocentrism Proceedings of the National Academy of Sciences, USA 108, 1262-1266

De Dreu, C.K.W et al (2011b) Reply to Chen et al: Perhaps goodwill is unlimited but oxytocin-induced is not Proceedings of the National Academy of Sciences, USA 108, 13, E46

Stapel, D.A & Lindenberg, S (2011) Coping with chaos: How disordered contexts promote stereotyping and discrimination Science 332, 251-253

Weaver, J (2011) The prejudice hormone Scientific American Mind May/June, p8

#### **4. THE KEY POINTS OF CRITICAL PSYCHOLOGY IN QUOTES**

1. "Psychologists in Britain usually assume that they are scientists, and that they study the mind and behaviour in much the same way that chemists, for example, study acids and alkali. Critical psychology questions this underlying assumption but also, more importantly, questions whether the discipline is really scientific at all" (Parker 2006).

2. The humanistic critique of scientific psychology stands against the reductionism (with holism) and artificially controlled environment which predicts and controls behaviour (by not treating the individual as an object). This is an objection to "science", whereas critical realism objects to "psychologists pretending that they are scientific" (Parker 2006).

3. In traditional psychology, "Oppression is rationalised through the myth of 'value-neutrality' and a specific status quo is legitimised, which favours certain groups of the population with opportunities and access to social and public goods" (Dafermos and Marvakis 2006).

4. Critical psychology questions the "truth claims" of "facts" produced by scientific psychology as "stories about human behaviour" which are "no more than fictions" (Parker 2006).

5. "Everyone is affected by psychology at some point in their lives, and many people have been used and abused by psychologists. The use of psychology ranges from the nonsense peddled in advice columns and chat shows in the name of 'science'... to the brutalising of patients subjected to drug treatments or electroshocks.. This includes even those subjected to the soft side of the psychological professions in the form of psychotherapy or counselling..." (Parker 2006).

6. "In short: Critical Psychology has a mission, and its mission is to struggle for a 'good' Psychology, a Psychology that takes into account human beings as societal beings, that does not degrade persons to values and variables, and that does not just serve the actual power without raising any questions" (Sanin 2006). Furthermore, "Critical psychology focuses on transforming the discipline of psychology in order to promote

emancipation in society" (Sloan et al 2006).

7. Dafermos and Marvakis (2006) argued that critical psychology should critique mainstream psychology in the following ways:

- Critique the (ab)use of psychological knowledge and techniques (eg: use of psychological knowledge in marketing and advertising).
- Critique psychology's societal and political function (ie: its "reproduction of structures of power and social inequality") (eg: intelligence testing and selection).
- Critique the underlying (theoretical and methodological) presuppositions and perceptions of knowledge in psychology (eg: the theoretical basis to modern individualism and the focus on the individual while ignoring the social context).

8. Piper Shafir (2006) emphasised two distinctions for critical psychology:

i) To be distinct from psychology implies a distancing from the individual as centre.

- "Conventional psychology reasons with the individual situated as the centre..."
- "... "a subject's (individual) separate existence that relates to an object (society), and the separate existence of some subjects with respect to others".
- "It is important to emphasize that for the Critical Psychology that we propose, the social dimension is not an attribute, a secondary specification, or an external characteristic of objects that might or might not exist. Therefore, no objects exist that do not contain it; ie: that are 'non-social'".
- "From the perspective of Critical Social Psychology, what conventional psychology terms mental entities, or, psychic apparatus do not have their origins inside people's heads, neither are they internalisations produced by a linkup with an external environment. These are in themselves social processes (and are therefore symbolic), constituting and constituted by what we call 'subjectivity'" (Piper Shafir 2006).

ii) Distinctiveness from conventional psychology is

being critical toward scientific rationality.

- "A scientific psychologist conceives of persons and societies as natural entities; ie: that possess a certain nature with laws that can be known and controlled".
- "To be critical toward scientific rationality is to mistrust the evidential force of facts; of the idea of knowledge as representation of the world; of faith in the efficaciousness of techniques; of the possible existence of a reality that goes beyond human action. Scepticisms derive from thinking that reality is a human production" (Piper Shafir 2006).

## REFERENCES

Defermos, M & Marvakis, A (2006) Critiques in psychology - critical psychology Annual Review of Critical Psychology 5 (<http://www.discourseunit.com/arcp/5.htm>)

Parker, I (2006) Critical psychology and critical practice in Britain Annual Review of Critical Psychology 5 (<http://www.discourseunit.com/arcp/5.htm>)

Piper Shafir, I (2006) Reflections on the emergence of a critical psychology in Chile Annual Review of Critical Psychology 5 (<http://www.discourseunit.com/arcp/5.htm>)

Sanin, D (2006) Critical psychology in Austria Annual Review of Critical Psychology 5 (<http://www.discourseunit.com/arcp/5.htm>)

Sloan, T; Austin, S & Warner, D (2006) Critical psychology in the belly of the beast - notes from North America Annual Review of Critical Psychology 5 (<http://www.discourseunit.com/arcp/5.htm>)