

## **PCT 50 – A Review of the Day – Kieran Lord**

Control has long been a concept associated with the University of Manchester, UK. John von Neumann's control-based computer architecture led to Alan Turing's seminal development of the world's first 'computer', the SSEM at the University in 1948. In the same year, Norbert Wiener published *Cybernetics*, a book that was to prompt Bill Powers to produce a robust framework for psychological functioning based on control engineering. Twelve years later, in 1960, Bill Powers, Robert Clark and Robert McFarland eventually published their groundbreaking work on Perceptual Control Theory (PCT) - a theory which 50 years on, has inspired individuals from across the world to embark on the University's Coupland buildings to attend the PCT50 conference. Situated next to the newly built 'Alan Turing Building', and historic 'Rutherford Building' (renamed in testament to Ernest Rutherford who was the first to split the atom there), on the morning of July 24th this year there was a sense of another historic event about to unfold.

There was a full day of presentations ahead so a coffee reception by the hosts and organizers Dr Warren Mansell and Dr Sara Tai (both of the University's School of Psychological Sciences), was a great opportunity for delegates to get acclimatized and acquainted. Once in the conference room each delegate gave their introductions to the group highlighting their areas of interest, what they hoped to get out of the day and how far they had travelled. This included a tongue-in-cheek competition for who had come from the smallest or most remote town amongst the academics, professionals, and students assembled from Australia, the US, Canada, Europe, and from across the UK.

It seemed perfectly appropriate that the unofficial 'father' of PCT, Bill Powers, gave the first presentation. For many his making the trip all the way from Colorado was in itself an inspiring way to start the day. Bill's hands-on presentation placing PCT into a wider theoretical context included a computer disturbance analogy ('Ghost Writer', available free to download from [billpct.org](http://billpct.org)) to demonstrate visually that the variable that is controlled in a control system is not the output of the system. Volunteers attempted to maintain a cursor at a point on a screen whilst a pre-programmed disturbance affected the cursor's position. The disturbance programmed into the cursor's positioning spelt out an upside down "hello", so to keep the cursor at the point the volunteer had to oppose the disturbance. This had the effect of spelling the word "hello" on screen without any conscious attempt to do so, nicely summarising the basic tenet of PCT that *behaviour is the control of perception*. Or as Bill concluded "Words a person is saying to you might not be what they are actually saying", whereby "behaviourists would say they were".

Bill also answered questions about the Method of Levels (MoL) psychotherapeutic approach, and how this related to PCT. In MoL, individuals with psychological problems attempt to control conflict occurring at a higher level; this is observed as outward symptoms. They may for example demonstrate symptoms of anxiety as a result of the process of controlling the conflicting goals of satisfying their career and family needs. Bill answered questions regarding MoL with psychosis, where hierarchy is switched at certain levels, and how to deal with symptoms by making people look at themselves and "question if they can control it".

One of the world's leading practitioners and researchers into MoL is Professor Tim Carey, from Canberra, Australia. Tim had spent the previous week at the BABCP conference, also at Manchester University, where he chaired a symposium on PCT and hosted a day-long MoL workshop. After a break to give delegates an opportunity to present their posters, Tim gave a group talk on current research methods, loosely around the inadequacies of the standard Random Control Trial (RCT) methodology, and how to incorporate more effective, realistic practices into future PCT research including ideas around PCT modelling and testing.

Next up was Dr Sergio Pellis and Heather Bell, both of the University of Lethbridge, Canada, who have been using the PCT methodology in their research into animal behaviours, including rats, insects and fish. Using the PCT approach Sergio had shown accurate explanations opposed to long-held beliefs about animal behaviours, including rat's play-fighting. It was previously thought that rats were squaring up in a particular way simply to make themselves look large and to intimidate. However, it was shown that as a means to control the perception of winning rats actually position themselves in such a way as to moderate potential attacks on themselves whilst achieving their goal (to bite the other rat on the rear).

Lunch was held in the cafe at the adjacent Museum of Manchester, currently host to the 'Darwin - Evolution of a Scientist' exhibition, established to celebrate 150 years since Darwin, from nearby Shropshire, published the world changing '*On The Origin of Species*'. The links with PCT appear again! Darwin's work still struggles to be accepted because it challenges the received view in certain arenas - just like PCT; and Gary Czikó has explained in his book, *Without Miracles*, how the principles of PCT are closely aligned to those of Darwin's (for example in using a form of 'universal Darwinism'). Lunch at the museum was buzzing with new friendships formed, contacts exchanged, and ideas evolving through excited discussions.

Economics was next on the menu with Kent McClelland from Iowa, USA, giving a lively, graphic and topical presentation on his application of PCT in analysing stock markets. Those assembled in the room were apparently equally as amused as Kent's wife as to why he did not dabble with the markets himself considering his insightful approach. Kent models individual agents using characteristic controlled variables, and by changing control system properties like gain and reference values he compares the respective behaviours and outcomes of agents on the virtual stock market. Following this another leading figure in MoL practice and research, Chris Spratt, a NHS therapeutic practitioner from Fife in Scotland chose to talk about some thought and discussion-provoking ideas he and others shared regarding the utilisation of control theory in eating disorders.

The brightly lit room often used as a classroom for Manchester University Psychology students (where PCT has become established on the syllabus) became increasingly warmed by the broad range of topics at hand. A number of delegates with student connections to the department were present, many who at the early stages of their academic and professional careers had been given a unique opportunity to learn of the global applications of PCT. Clearly a universal appreciation of PCT amongst all delegates was the platform for invaluable cross-discipline learning. Fitting therefore that Fred Good was next on the rostrum.

Fred, from Orange County, North Carolina, gave a talk on 'Evaluating teaching PCT in schools' which highlighted the historical development of education research in the US, and the work past and present conducted by the National Research Council into scientific enquiry into education.

This included the future funding and direction of research into improving schools from the 'inside out' utilising PCT.

From the *outside in* it was apt that Rick Marken, another 'father' of PCT, apologetic at being unable to make it on the day, gave the final presentation via video-link from his home in California, USA. Richard gave a talk highlighting how in a closed loop system the independent variable (IV) does not cause the dependent variable (DV), "blowing away experimental Psychology". Aided graphically in-house by Sara Tai, Richard also showed how the correlation between the Input variable (I) and DV in a control view of systems due to potential disturbance in the system is "none". Rick also used the opportunity to suggest future experimental research in PCT should be aimed at "causes", and "mapping hierarchy" within systems; more to mull over before the final poster presentation session.

There were numerous colourful and attention grabbing posters presented across the fields of economics, education, psychology, psychotherapy, and PCT at large. One presentation appeared to capture the attention of all delegates at some point during the day and was the subject of much debate in the penultimate discussions: Jason Wright from the host University had created a computer application which mimics a MoL therapist's responses to textual inputs. It even used PCT methodology in its programming to enable auto-development over time. In an age of increasing computer and Internet usage, with restricted resources, funding and access considerations, the program was met with universal reverence. Further developmental ideas for this futuristic package suggested in the discussion included voice and facial recognition.

And so indeed to the future, the final discussions of the event led by Warren and Sara (aside from the later social dinner and pub discussions) related to 'where PCT is and 'where it is going'. The group agreed that the conference should be the first of many; where and when being the only unresolved issues, testament to the increasingly international involvement of PCT. Bill was noticeably impressed with, and proud of the day's proceedings occurring within his lifetime, fifty years since his seminal work. He explained to the younger delegates that they would remember this historic day long into the future, met by nods of appreciation all round.

There have already been several world changing developments over the years in this group of buildings; could this conference be the beginning of another? The destiny of Bill's prediction is in the hands of all those who filtered out slowly from the conference room, stopping only to ensure they had made the contacts they needed to control any disturbances on making this DV a reality.