

## Teaching PCT at an Undergraduate Level: A Review of the First Year and Plans for 2008/9

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### Background

At the International CSG Conference in 2007, I reported my plans for a third year undergraduate module on Perceptual Control Theory (see Mansell, 2008 and Appendix 1). In sum, the undergraduates studying psychology at the University of Manchester can choose their third year options of study, which are all specialist subjects taught by academic staff who work in that area. There are around 30 students per class, and they run throughout one semester for eleven to twelve 2-hour sessions, once per week. My module constituted an introduction to PCT, Method of Levels and a variety of applications of PCT. The teaching style involved a combination of live and computer demonstrations, group-working, lectures, student presentations and online e-learning using Blackboard virtual learning environment with discussion groups. Within this blended learning format I tried to encourage access to as many PCT resources as possible, including the key PCT websites (Appendix 2), and the most popular demonstrations (e.g. rubber band; coins TCV; standing on one leg; 'how' and 'why' questions; finger tracking). In addition, during some sessions postgraduate students knowledgeable in PCT helped out, there was an 'artist in residence' present during one session, and the penultimate session included another clinical psychologist with whom I demonstrated MOL.

In terms of assignments, the students had a formative multiple choice computerised assessment that was not counted towards their grade, plus three graded assignments:

- 2000-word essay: "What do we mean by 'control'? How does Perceptual Control Theory help us to understand how people manage to exert control over their lives."
- 1000-word assignment. See Table 1 below for the Instructions. The wide variety of topics the students chose are provided in Appendix 3.
- 10-minute oral presentation of a paper (see Appendix).

### Table 1: Instructions for the 1000-word assignment

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This 1000-word assignment is a proposal for an application, utilisation or extension involving Perceptual Control Theory. Essentially, it is your opportunity to apply PCT to any domain of interest you have, and in any way. For example the proposal could be:

- An explanation of how PCT can explain a particular phenomenon
- An description of how PCT can be used in an applied setting
- An example of an empirical study or computer simulation that could test PCT
- A theoretical addition to PCT that may improve the theory.

The domain of interest can be as wide as you like, not necessarily restricted to psychology. Examples include: business, education, politics, economics, personal development, computing, sociology, media, hobbies, health, etc, etc! Please think as widely as possible, and generate an idea that is personally important and valuable to you.

The key assessment domains will be:

- Adherence to, and understanding of, PCT
- Originality and creativity
- Clarity of language and coherence
- Impact of the proposal for development in theory, research or practice

You are encouraged to work in groups to help one another with this assignment. Please join the relevant Discussion Groups as soon as you are ready to begin working on this assignment.

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This paper summarises how module was received by the students, including any systematic attempts to get feedback from the students on improvements to be made.

### Methods for Receiving Feedback

I accessed feedback from several sources. First, a colleague of mine sat in on a session and provided feedback on my teaching. Second, I asked for questions and feedback at the start of each teaching session and encouraged students to email me. Third, I requested anonymous qualitative positive and negative feedback towards the end of the teaching. Finally, I generated some of my own impressions of how the teaching was progressing.

### Results

#### *Feedback from colleague*

The feedback was generally positive in terms of the teaching style and format. One suggestion was to tell the students in advance how long they were to have for a group task, and to count down the time they had left. Similarly, I was prompted to allow a full 10-minute break and 10 minutes at the end of the session. There were some difficulties at this stage getting volunteers involved for interactive tasks, so more creative methods may be necessary in the future.

#### *Direct feedback during teaching*

Few suggestions were provided by students during the teaching. However, it became apparent that there was some asynchrony between the oral presentations and the teaching plan. I had asked student to present on PCT-related papers before I had fully explained the theory to the rest of the class. Therefore, some students felt very much behind with the theory. One student asked for more lecture-based content during the teaching.

#### *Anonymous qualitative feedback*

Many students had very positive feedback for the theory (Appendix 4) and for the teaching as a whole (see Appendix 5). Many of them had grasped that PCT was like no other theory in psychology, with a wide, and yet parsimonious, capacity of explanation for a diverse range of phenomena relating to control. This was not completely universal with two students admitting not seeing the 'point' of PCT unlike their peers. In terms of negative feedback, the following suggestions were made:

- Explain PCT before introducing the student presentations on PCT studies; apparently the paper I wrote on PCT (Mansell, 2005) was particularly helpful but students came across it late in the course.
- Provide some critical debate about PCT
- Make the PCT books more available in the library
- Provide a wider range of questions for the 2000-word essay
- Where the group sessions were led by 'experts' this was not helpful as it divided the students into different levels (see later)

#### *My own impressions*

The positive experience from the teaching was very evident, and the students appeared to enjoy the involvement. Their 2000-word essays, while varying in level, nearly all showed that they had grasped the basics of PCT, which is more than most academics! The 1000-word assignments were a joy to mark (which is a rare experience!), given the sheer creativity and breadth. I believe that some of them are the start of publishable papers.

Consistent with the students' feedback, I gained the impression that the earlier oral presentations relied too much on the audience understanding PCT. I also became aware that the students could see the conflict between the PCT approach and traditional psychology yet did not have a full opportunity to debate these issues. I also noted the problems with group tasks where I had deliberately asked students to nominate themselves as 'experts in PCT' to help facilitate the groups. Finally, I noted that the demo of MOL went down particularly well, and illustrated the direct application of PCT.

## Implications

The feedback has led to a range of improvements that I plan to put into practice for next year. These are as follows:

- Provide appropriate timings for tasks, and sufficient breaks (implemented during 2008)
- Introduce the theory in several sessions, using more lecture-based and interactive teaching, before beginning the student presentations that require a knowledge of PCT. Provide Mansell (2005) paper early on in the course.
- In lieu of some of the oral presentations, provide some new papers, plus two weeks of debates that reflect published debates between PCT and Behaviorism and between PCT and Self-efficacy. See Appendix 6 for the revised list of papers for presentation.
- Drop the 'expert on PCT' in the groups and replace with group nomination of a facilitator
- A choice of three questions for the 2000-word Assignment
- Order more copies of key books (e.g. Powers, 1973; Robertson & Powers, 1990) for the library
- Perform an MOL session early on, when the concept of conflict and levels are covered.

In addition to the changes that followed on from feedback, I am considered the following implications:

- I am considering collecting data from individuals on the tracker task near the start of the course and illustrating its reliability over time in those same individuals through the course.
- Provide an online advice sheet about how to give a good presentation
- Measure outcomes on attitudes and beliefs about behaviour and control before and after the teaching, possibly in comparison to another third year module that is not focused on PCT.
- Facilitate the development of a Student PCT Interest Group. This is now ongoing with a growing membership, and administered by two postgraduate students: Clive Ferenbach ([cferenbach@hotmail.com](mailto:cferenbach@hotmail.com)) and Caron Westwood ([caron.westwood-2@manchester.ac.uk](mailto:caron.westwood-2@manchester.ac.uk)).
- It became increasingly apparent that there was no up-to-date text book on PCT. Therefore I have begun to bring together editors and authors for a new edition of the Roberston & Powers text book that ideally will be in full colour, with images, inserts and online support.

## Conclusions

The first year of the module on PCT, the first on the topic in a UK university, has been a relative success, eliciting very positive feedback from a good proportion of the students, who continue to be interested in PCT. I plan to make a range of further improvements for the 2008/9 cohort and I am keen on disseminating this module, or components of it, to anyone who wishes to replicate it locally. I would also appreciate any new feedback and suggestions.

## References

Mansell, W. (2005). Control Theory and Psychopathology. An Integrative Approach. *Psychology and Psychotherapy: Theory Research and Practice*, 78, 141-178.

Mansell, W. (2008). Research and Dissemination of Perceptual Control Theory: Methods, Results and Conflicts. In P. S. E. Farrell (Ed.), *Control Systems Group: International Conference 2007 Proceedings*. [www.psych-sci.manchester.ac.uk/aboutus/events/csgconference/](http://www.psych-sci.manchester.ac.uk/aboutus/events/csgconference/)

## Appendix 1: Summary of Course Content

*Title: Control and Conflict in Human Behaviour: Implications for Theory, Research, Psychological Therapy and Other Applied Areas*

*Lecturer: Warren Mansell*

*No. Students: 35 maximum*

Psychology is accused of many things: being a 'soft' science; being too abstract; using 'folk' terms with ambiguous meanings (e.g. beliefs, attitudes, personality, etc), creating a 'little man inside the head', 'homunculus' or a 'ghost in the machine'; and being over-influenced by certain individual's global views, such as Freud, Skinner, Eysenck and Beck.

This course takes the view that psychology is answerable to every one of the above accusations and more. As a consequence, it gets back to the roots of psychology within biology, and explores biological systems from a functional perspective. It then reconstructs the properties of human behaviour from here. Luckily a great deal of work has been done on this so far, behind the scenes of mainstream psychology. Students will be asked to explore the concept of 'control' as a property of living systems and how control is achieved in mechanistic terms (hierarchies of negative feedback loops). They will be asked to consider how conflicts between different control systems are inevitable, yet the management of these conflicts is the way that people adapt to new challenges and changes within themselves and their environment. Perceptual Control Theory (PCT; Powers, 1973; 2005) will be introduced as the most detailed and applicable theory of control in humans. PCT developed from the Cybernetics movement of the 1940s and 50s, and its author W. T. Powers continues to develop and illustrate its applications today. These range from robotics and ergonomics, to understanding stages of child development and improving techniques within psychological therapy (Method of Levels). Students will be encouraged to consider and develop their own applications too.

This course will particularly appeal to students who have one or more of the following: a drive to integrate psychology with wider disciplines; a motivation to draw on any existing knowledge of biology, engineering, computing or mathematics they may have; a fascination with how people control or fail to control; a desire to learn how to provide psychological therapy that is immediately empathic and empowering.

### *Aims*

- To appreciate the importance of control as a property of living systems
- To understand how control can be achieved in mechanistic terms
- To appreciate that conflict between different control systems best represents the problems to which humans need to adapt
- To understand the principles, mechanisms, implications and applications of Perceptual Control Theory (PCT).
- To develop experience and understanding of Method of Levels as a psychotherapeutic technique.

### *Objectives*

By the end of the course, the student should be expected to:

- Have a good understanding of the nature of control and theories of control within engineering, biology and psychology
- Have a good knowledge of PCT including its strengths and applications, limitations and potential extensions
- Have experience in Method of Levels and develop an understanding of how it may help people deal with their problems and manage their life

### *Course Outline*

The following topics will be covered:

1. The Problems with Psychology: A light but critical analysis of psychology as a discipline
2. What is Control? Introduction of the principles and mechanisms of control within engineering, biology, cybernetics and psychology.

3. What Causes Conflict and How is it Managed? A discussion of conflict across wide domains including practical demonstrations and everyday examples
4. Revisiting Psychology. A collaborative attempt to revisit key areas from the perspective of control, such as operant conditioning, cognitive psychology and neuroscience.
5. Perceptual Control Theory (PCT) Part One. An explanation of behaviour as the control of perception and introduction to the hierarchy of control systems.
6. PCT Part Two. A discussion of conflict within PCT, its causes, consequences and resolution through reorganisation.
7. Terminology Redefined. A discussion of how familiar concepts within psychology sit within PCT, including: automaticity, awareness, learning, memory, language, beliefs, emotion, imagination, personality, and cognitive behavioural therapy.
8. Applications of PCT. The wide uses of PCT within robotics, human factors, education, sociology, and psychology.
9. Peoples' Experience of Change. A discussion of how people manage, experience and overcome conflict in their lives, and how approaches such as cognitive behavioural therapy address change.
10. Method of Levels: A psychotherapeutic technique for facilitating intrinsic change or "How to do psychotherapy without getting in the way"
11. Future Directions of PCT. Student's perspectives on how PCT could be explored, utilised, and modified.
12. Review of Course. Questions and Answers.

**Appendix 2: Key Weblinks for the Course**

<http://www.mindreadings.com/demolist.html>

[http://www.brainstorm-media.com/users/powers\\_w/](http://www.brainstorm-media.com/users/powers_w/)

<http://www.perceptualcontroltheory.org/links.html>

<http://www2.cmp.uea.ac.uk/~jrk/Robotics/Archy/Archy.html>

[http://www.livingcontrolsystems.com/demos/tutor\\_pct.html](http://www.livingcontrolsystems.com/demos/tutor_pct.html)

<http://www.perceptualcontroltheory.org/articles/BestOfCSGNet/index.html>

<http://www.neurotransmitter.net/control.html>

<http://faculty.ed.uiuc.edu/g-cziko/twd/pdf/twd03.pdf>

[http://www.livingcontrolsystems.com/video/mol\\_session.wmv](http://www.livingcontrolsystems.com/video/mol_session.wmv)

<http://www.psych-sci.manchester.ac.uk/aboutus/events/csgconference/>

### **Appendix 3: Titles of Third Year 1000-word Assignments**

How can Perceptual Control Theory be applied to reflex reactions?

The development, maintenance and expansion of avoidance behaviours: A Perceptual Control Theory account

Is the 'self' an active agent setting our reference values that drive our behaviour?

Procrastination from a Perceptual Control Theory Perspective

How Perceptual Control Theory can help parents to understand how to control their emotions

Can PCT offer an insight into non-adherence in asthmatics?

The interpersonal civil war: How PCT can aid in our understanding of Dissociative Identity Disorder

Application of Perceptual Control Theory to Anorexia Nervosa

A PCT hypothesis for the explanation of the behaviour of Anorexia Nervosa sufferers

An explanation of Bulimia Nervosa as a control system out of control

Using Perceptual Control Theory to explain the occurrence and treatment of phobias

Perceptual Control Theory applied to Trichotillomania

An application of Perceptual Control Theory: Understanding and explaining symptoms and features of Autism

ADHD: A PCT Perspective

A discussion on the applicability of Perceptual Control Theory to drug abuse in the female prostitution industry

Trafficked women: Using PCT to improve and extend existing treatment models

Principles of Perceptual Control Theory in relation to the 'Milgram effect'

How PCT could be used to explain and possibly address rapid shifts of behavioural control – the examples of mob mentality and sensation seeking behaviour

The benefits and limitations of explaining the behaviour of social groups and nation states using PCT

How could the principle of PCT be used to explain the behaviour of Hitler during the Holocaust?

Control in the extreme: The Zimbabwe crisis

A theoretical account of how PCT relates to business and may help minimise sexism within work

The under-representation of Afro-Caribbean females within British higher education: A case of choosing education or ethnicity? A Perceptual Control Theory perspective

The application of Perceptual Control Theory to a 'St. Trinians' classroom environment

How does Perceptual Control Theory explain the experiences of the protagonist in the movie 'Donnie Darko', his lack of behavioural control, hallucinations and the ineffective treatment he receives?

Application of Perceptual Control Theory to the film 'Monster'

In the movie 'Cruel Intentions', how might Perceptual Control Theory explain the reference values, reorganisation of reference values and the consequential behavioural changes of Kathryn and Sebastian?

#### Appendix 4: Students' Comments on PCT

"PCT as a theory inspires me more and makes greater sense to me than any other psychological theory I have studied in the three years of psychology."

"PCT and the lecture content has fueled many debates, outside of lectures, within my peer group far more than any previous lectures."

"It may be the most practical/applicable module I have studied in that it seems totally relevant even 'outside of the classroom' unlike some aspects of psychology. The theory is also logical and sensible and does not feel like learning"

"I enjoy the real life application of PCT – in everyday life we discuss PCT in relation to our lives, which has never happened before."

"It is interesting to learn about a theoretical framework that seems to apply to a number of domains and explain things in a different way to traditional psychological theories."

"This course brought many aspects of psychology together."

"PCT is an interesting theory that should be involved far more in the teaching of psychological processes – therefore, this course has advanced my understanding of psychology."

"It is very different to any lecture course I have ever taken. The teaching is very enthusiastic and has enabled me to take on a new perspective to psychology that I hadn't thought of before."

"I really enjoyed the course, it kept me interested, and I can now look at behaviour from a totally different point of view."

"It was great to be introduced to a theory that, once having studied it, seems so obviously 'true' and its application so wide-reaching, but that is so ignored by the scientific literature that its crying out to be taught, discussed and researched more thoroughly!"

"The topic of PCT I found pretty boring, but that's probably just me and was nothing to do with the teaching (which was good)."

"The topic of PCT didn't particularly interest me (but that's just personal taste)."

"When I first came across PCT I was somewhat scared by the theory. I doubted that I'd ever be able to understand how it worked as it wasn't really like anything I had come across before in psychology. However, with perseverance I managed to get my head around the basic principles of the theory and then pretty much became captivated by it! I'd attempt to explain anything and everything I saw in terms of the control of perception, and with lots of reading I became completely impressed by the breadth of explanatory power PCT had. My own research involved applying PCT to the understanding of the causes, maintenance and recovery from psychological distress. What struck me, is that PCT incorporates many familiar principles from quite divergent theoretical approaches and combines them into a unified theoretical framework. What I like about PCT is that it forces me to remain very much theoretically minded about a somewhat applied topic. With PCT I have the best of both worlds in that it enables me to combine a robust and vigorous theory (something surely every psychologist wishes to find?!) with the 'real life' topic of psychological distress, a topic I am very much passionate about." [postgraduate student]

**Appendix 5: Quotes from Undergraduates about teaching style**

“The course leader was very approachable and is clearly very interested in the topic which leads to a stimulating learning atmosphere.”

“Teaching style is exciting! And different from every other module.”

“Resources provided online are excellent and info about upcoming assessments, etc is really helpful. Provisions of learning materials, etc are above and beyond all other modules. Very good!!”

“I enjoyed the interactive elements – playing with elastic bands!”

“The lectures involved a lot of group discussion and group work which I think helped to understand the concept of PCT more than just listening to a presentation.”

“The assignments encouraged ‘out-of-the-box’ thinking.”

“I really enjoyed the interactive element of the course, such as the demonstrations. It really helped me to understand the mechanism of PCT which I think would be hard to do just by reading about it or seeing diagrams. Also, the discussions in the class also really helped as they allowed me to consider other people’s take on the theory.”

“I really like the way the course is assessed – I enjoyed doing the presentation and was glad to have a choice of topic for the extension of PCT coursework. The varied assessments made it easier to develop a broader knowledge and made it more fun and interesting to learn.”

“The thing I liked about this unit was the interactive nature of the course through online and class discussions.”

“Discussion and group work helped my understanding of the topic.”

“It was a very involving course for all students – rather than merely being taught a specific approach, we had an involvement in developing our own viewpoints and ideas regarding PCT and its applicability.”

“The demonstrations were really helpful. They illustrated certain aspects of the course that, on paper, may have been difficult to understand.”

“Group tasks helped increase involvement and interest in the topic. Tug-of-War contests were fun example demonstrating conflict in PCT, and helped visualise the processes involved.”

## Appendix 6: Revised Oral Presentation Papers 2008/9

### **Non-PCT Papers on the key phenomena and principles**

Esiikovits, Z., & Buchbinder, E. (1999). Talking control: Metaphors used by battered women. *Violence Against Women*. <http://vaw.sagepub.com/cgi/content/abstract/5/8/845>

Jarman, M., Smith, J. A., & Walsh, S. (1997). The psychological battle for control: A qualitative study of health-care professionals' understandings of the treatment of Anorexia Nervosa. *Journal of Community & Applied Social Psychology*, 7, 137-152.

Hunter, S. C., & Boyle, J. M. E. (2002). Perceptions of control in the victims of school bullying: the importance of early intervention. *Educational Research*, 44, 323-336.

Green, J. M., & Baston, H. A. (2003). Feeling in control during labour: Concepts, correlates, and consequences. *Birth*, 30, 235-247.

MacFarlane, D.A., (1930). The role of kinesthesia in maze learning. *Univ. Calif. Publ. Psyc.*, 4, 277-305.

Rosenblueth, A., Wiener, N., & Bigelow, J. (1943). Behavior, Purpose and Teleology. *Philosophy of Science*, Vol. 10, No. 1 (Jan., 1943), pp. 18-24. [http://www.jstor.org/sici?sici=0031-8248\(194301\)10%3A1%3C18%3ABPAT%3E2.0.CO%3B2-8](http://www.jstor.org/sici?sici=0031-8248(194301)10%3A1%3C18%3ABPAT%3E2.0.CO%3B2-8)

### **Testing and Explaining PCT**

Marken, R. (2002). Looking at behavior through control theory glasses. *Review of General Psychology*, 33, 260-270.

Bourbon, W. T. (1996). On the accuracy and reliability of predictions by Perceptual Control Theory: Five years later. *The Psychological Record*, 46, 39-47.

Marken, R. S. (2003). Error in skilled performance: A control model of prescribing. *Ergonomics*, 46, 1200-1214.

Powers, W. T. (1979). The Nature of Robots. *Byte Magazine*.  
[http://www.livingcontrolsystems.com/appendixes/byte\\_june\\_1979.pdf](http://www.livingcontrolsystems.com/appendixes/byte_june_1979.pdf)

### **Debate Papers**

Powers, W. T. (1973). Feedback: Beyond behaviorism. *Science*, 179 (4071), 351-356.

vs

Baum, W. M., & Reese, H. W. (1973). Behaviorism and feedback control. *Science*, 181 (4105), 1114, 1116, 1118-1120.

[Both papers are available in Powers (1989; 2005) *Living Control Systems*.]

Bandura, A., & Locke, E. A.. (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology*, 88, 87-99.

vs

Vancouver, J. B. (2005). The depth of history and explanation as benefit and bane for psychological control theories. *Journal of Applied Psychology*, 90, 38-52.

### **PCT Applications**

Phipps, D. (2008). A Perceptual Control Theory Approach to Task Analysis. In P. S. E. Farrell (Ed.), *Control Systems Group: International Conference 2007 Proceedings*. [www.psych-sci.manchester.ac.uk/aboutus/events/csgconference/](http://www.psych-sci.manchester.ac.uk/aboutus/events/csgconference/)

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