

## Connecting the dots: What can we learn from other disciplines about behaviour change?

Janet Conte<sup>1</sup>, Catherine Baudains<sup>2</sup> & Tom Lyons<sup>2</sup>

<sup>1</sup> Department of Agriculture and Food, Western Australia, 120 South West Highway, Waroona 6215

<sup>2</sup> School of Environmental Science, Murdoch University

Email: janet.conte@agric.wa.gov.au

**Abstract.** Agricultural extension evolved from, and has drawn on, the disciplines of social psychology, education and rural sociology. However, agricultural extension has not remained connected with developments in psychological, educational and sociological theory. This paper proposes that there are critical lessons to be learned by aligning extension practices to developments in social science theory and practice. The theory of planned behaviour (TPB) from social psychology proposes that behaviour is partly explained by: people's attitudes towards the expected results of changing behaviour and how highly valued this is; norms related to the behaviour and degree to which people want to comply with these norms; and the degree of perceived control people have about conducting the behaviour, i.e. their perceptions of their ability to do it. While current agricultural extension practice already focuses on some of these areas through attempts to influence attitudes and improve skills and knowledge, application of this theory to agricultural extension may provide more rigour, more direction on the types of attitudes to influence and the way in which to do this. This could lead to improved rates of behaviour change as a result of extension programs and has the potential to be incorporated into both planning and evaluating these programs. In addition, while adult learning theory is regularly applied in agricultural extension, self regulation of learning (SRL) theory has not been implemented or trialled. SRL theory has been applied in environmental education in order to successfully increase rates of behaviour change and there may be lessons for agricultural extension. This theory also has many similarities to adult learning theory as it relates to: active involvement of learners in setting their learning goals; choices in the way they will learn; self-monitoring of achievement; and maintaining motivation to achieve goals. Three key learnings are: the theory of planned behaviour may provide some rigour to attempts to influence behaviour change in farmers; self regulation of learning theory has been successfully applied to environmental education; and while there are similarities between SRL and adult learning theories, SRL theory needs to be tested in extension.

**Keywords:** theory of planned behaviour, self regulation of learning theory.

### Introduction

Agricultural extension originated in the fields of social psychology, sociology, education and economics. It has traditionally drawn on areas like adult education and learning, communication, adoption and diffusion theory, systems theory, participatory research, learning styles and program logic.

One of the main aims of agricultural extension is to effect behaviour change in the target audience, whether they are, amongst others, farmers, land managers or consultants. A great deal of research has investigated the factors related to the farm/farmer that influence adoption, identifying many different factors, as categorised below.

1. Education and training
2. Farming or land management experience
3. Farm financial characteristics
4. Farm family characteristics
5. Farm structure
6. Attitudes, perceptions towards and expectancies of change
7. Social and institutional contact as sources of change
8. Voluntary participation (Fenton et al 2000).

The focus in agricultural extension is often on: 1. education and training; 6. attitudes, perceptions and expectancies; and 7. social and institutional contact. Attempting to influence these factors, and ultimately adoption, isn't easy. Agricultural extension has been searching for answers and it seems timely to look at other disciplines that are also attempting to influence behaviour change, like health education and environmental education.

### Health education

Health education aims to encourage people to adopt healthy behaviours (Campbell 2001). In terms of behaviour change models, health promotion draws on, for example:

- Transtheoretical Model or Stages of Change Model
- Health Belief Model

- Consumer Information Processing Model
- Social Learning or Social Cognitive Theory
- Theory of Planned Behaviour (Campbell 2001)

The Transtheoretical Model or Stages of Change Model (Prochaska et al 1992) has six stages: precontemplation, contemplation, preparation, action, maintenance and termination. A very similar model, the adoption decision process, is used in agricultural extension: awareness of the problem or opportunity, non-trial evaluation, trial evaluation, adoption, review and modification, and non-adoption or dis-adoption (Pannell et al 2006).

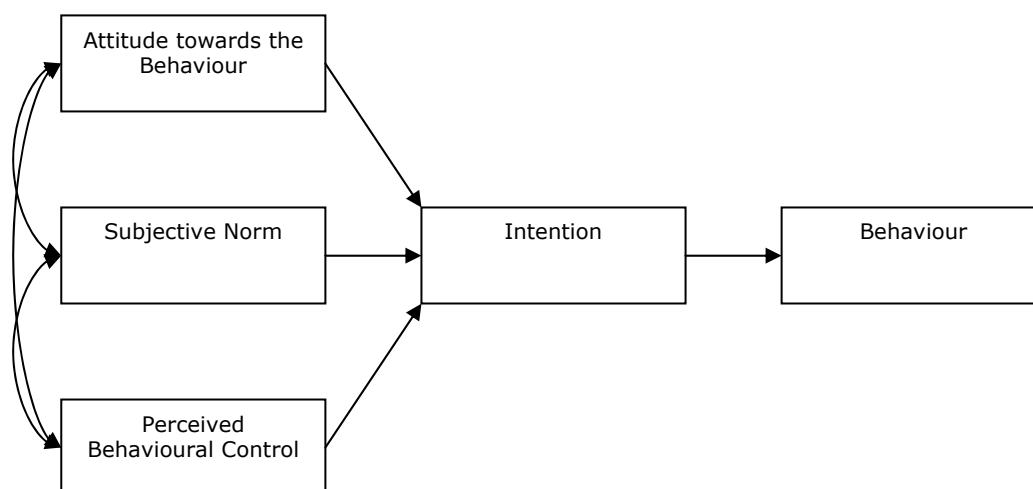
While the Health Belief Model, Consumer Information Processing Model and Social Learning Theories all potentially provide some useful guidance for agricultural extension, the Theory of Planned Behaviour will be examined in more detail. It has been applied to agricultural extension in Western Australia in the past, for example conservation cropping practices in the Avon Catchment of Western Australia (Gorrdard and Nash 1992), a qualitative study on land use practices in the Avon Catchment (Toric 2005), and in the adoption of forward contracts in the wool industry (Jackson 2008).

### ***Theory of Planned Behaviour***

The theory of planned behaviour (TPB), from social psychology, is based on the work of Fishbein and Ajzen (1975) and their theory of reasoned action (see Figure 1). It states that behaviour (and the intention to undertake the behaviour) is related to:

1. attitudes towards the behaviour
2. subjective norm
3. perceived behavioural control.

**Figure 1. Theory of Planned Behaviour conceptual diagram**



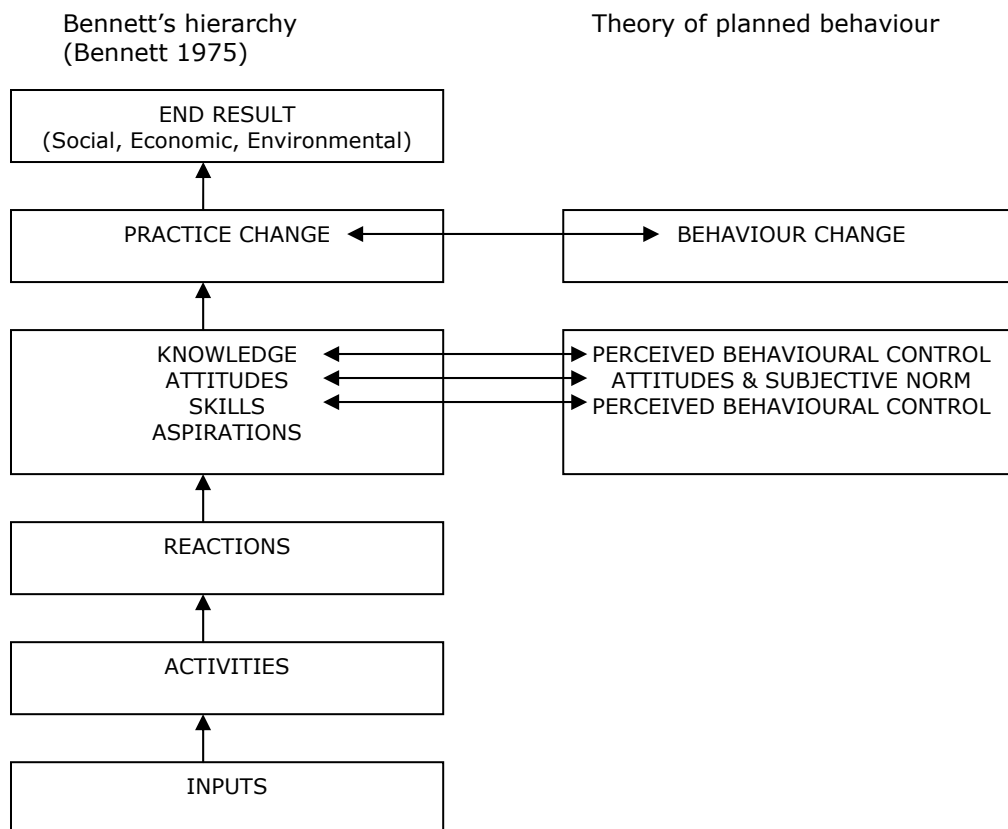
It has been used in many different contexts - recycling (Oom do Valle et al 2005), AIDS education (van der Pligt and de Vries 1995), transportation behaviour (Dalla Rosa 2007), farmers' use of seasonal forecasting (Hu et al 2006; Artikov et al 2006), academic performance (Manstead and van Eekelen 1998) among many others - and has shown to be robust over a long period of time. It is no wonder others have seen its potential for agricultural extension.

### ***Applying the Theory of Planned Behaviour***

Factors in the TPB reflect some of the constructs already addressed in planning and evaluating extension programs or activities. As an example, Figure 2 shows a comparison of the TPB with Bennett's Hierarchy (1975) a program logic framework widely used in agricultural extension.

One contribution that the TPB can make is in providing further rationale for the link between knowledge, attitudes and skills, and practice change. Aspirations are deliberately not included as some would argue that it's not ethical or practical to try and change people's aspirations. Many agree, however, that it is vital to understand them. For example, Pannell et al (2006) found that farmers' perceptions of how well an innovation helps them achieve their goals are very important in their decision to adopt.

**Figure 2. How Bennett’s hierarchy relates to the theory of planned behaviour**



The other contribution is in the deeper understanding of the types of knowledge, attitudes and skills that influence behaviour change. Figure 2 highlights some of the parallels between Bennett’s Hierarchy and the TPB but the concepts of the TPB are explained below.

Firstly, an obvious parallel exists between *practice change* and *behaviour change*.

Secondly, while Bennett’s hierarchy includes *knowledge* and *skills* and the assumption is that if *knowledge* and *skills* are improved then the likelihood of *practice change* is increased; the TPB includes *perceived behavioural control*. This concept goes further than just a person’s knowledge and skills in relation to the practice change and includes perceptions about how easy the behaviour is, but also *perceived self efficacy* (belief that they have the skills to undertake the behaviour) and *perceived controllability* (extent to which they believe it is possible to control a situation, regardless of skills or abilities).

An example of how the TPB may be applied to encouraging the use of climate information would be to ensure that tools and information are as easy to use as possible and that this is communicated and demonstrated to farmers, that farmers are given opportunities to understand climate information and learn how to use it (*self efficacy*), that climate information is accurate and timely and the information source is reliable (*perceived controllability*)

While Bennett’s hierarchy refers to *attitudes*, the TPB is very clear that the attitudes to focus on are *attitudes to the behaviour* and *subjective norm*. In other words, if someone believes that a behaviour will lead to a certain outcome and they value that outcome highly (*attitudes to the behaviour*) and if someone believes that many people want them to undertake a particular behaviour and they strongly believe that they should comply (*subjective norm*), they are more likely to undertake that behaviour. So rather than a vague notion of the attitudes to focus on, this provides very clear guidance on the types of attitudes to target.

Some examples to illustrate this are that the TPB would suggest that in encouraging the use of climate information, it would be important to communicate the ways in which the use of climate information can assist in increasing profits (for those who value increased profits) and there may be ways to communicate how other farmers are using climate information on their farms which may alter farmers’ perceptions of subjective norms about the use of climate information, assuming that they value the opinions of other farmers.

A broad assessment of the TPB factors in a target audience could then inform the design of the extension program and allow evaluation of any behaviour changes following people's participation in an extension activity or program.

### Environmental education

Environmental education, or education for sustainability, is also interested in influencing people's behaviour, towards more sustainable practices. The Australian government has recently moved away from the term environmental education and instead refers to 'education for sustainability', which has a focus on "equipping all people with the knowledge, skills and understanding necessary to make decisions based upon a consideration of their full environmental, social and economic implications" (Commonwealth of Australia 2009, pp.3-4).

In terms of the education processes used, various learning theories are drawn upon but one that has been researched in recent years is self regulation of learning theory. Like the TPB, it has been applied in a Western Australian context to behaviour change in encouraging choices away from single occupancy vehicle journeys (Baudains 2003).

### Self-regulation of learning theory

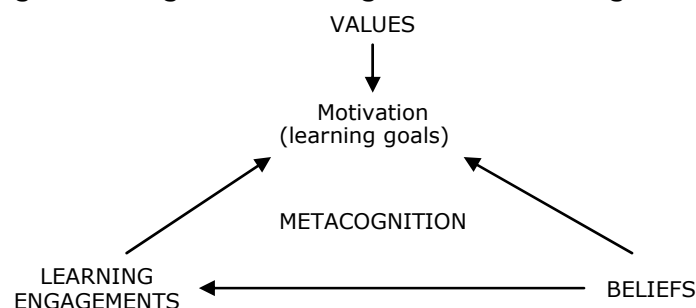
The theories of self-regulation of learning (SRL) and adult learning have quite a few similarities. Both emphasise the importance of the learner:

- participating in the learning process
- being involved in planning the learning experience
- feeling a need to learn
- feeling that the learning relates to their problems
- setting their own goals and having a sense of progressing towards them
- being self-directed
- undertaking a process of action, reflection, conclusion and planning
- being in a situation where learners can learn from each other.

The key difference is that SRL theory emphasises participants learning how to learn. Learners can be described as self regulated if they are metacognitively, motivationally and behaviourally active in their own learning process and use various strategies to achieve their learning goals (Zimmerman & Schunk 1989).

A diagram (see Figure 3) that is often used to explain SRL theory shows how values influence motivation (learning goals) which lead to learning engagements and, subsequently, learning outcomes (Radloff 1997). Beliefs about self and the task influence learning goals and learning engagements. In a cycle, learning outcomes also affect future learning goals by changing a learner's beliefs about themselves and the task.

**Figure 3. Diagram of self regulation of learning theory**



Self regulation of learning theory has been found to enhance learning in various applications; e.g. academic achievement (Zimmerman and Schunk 1989), on-line education (Dell 2006), transport choices (Baudains 2003), and field-based writing (Bhattacharya 2006). For these reasons, it is important that self regulation of learning theory be tested in an agricultural context, to see if it can influence behaviour change as a result of extension activities.

### Applying self regulation of learning theory

Agricultural extension activities frequently use adult learning and education principles in their design. SRL could be therefore be applied to agricultural extension in a similar way, by expanding on the application of adult learning and adult education principles and ensuring that participants are provided with some tools for how to learn. In relation to the use of climate information, an example might be in allowing opportunities for participants to set goals for their

use of climate information, to analyse or discuss the way in which they are currently making decisions, hearing how others are using climate information on their farms, discuss problems they face on their farms and ways to overcome these and to undertake a process of action learning (action, reflection, conclusion and planning).

### Our research

Our research is asking “can self regulation of learning theory be applied, cost-effectively, to the design of agricultural extension to increase the adoption rate of climate risk management tools among grain farmers in Western Australia?” Self regulation of learning theory will be used, and tested, in the design of agricultural extension interventions and the theory of planned behaviour may be used as a framework to inform early interview questions and baseline and post-intervention surveys.

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