29-31 August 2014
University of Otago,
Dunedin, New Zealand

New Zealand Association for Behaviour Analysis 11th Annual Conference

CONFERENCE PROGRAMME

www.nzaba.org

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of
OTAGO
Te Whare Wānanga o Otāgo
NEW ZEALAND

NZ
Association for Behaviour Analysis

STEWART'S COFFEE

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SAPERE AUDE

50 YEARS
1964 - 2014

50th Anniversary of the
Department of Psychology at Otago
Te Tari Whakamātau o Hinekaro i Otāgo

UNIVERSITY of OTAGO
Te Whare Wānanga o Otāgo
NEW ZEALAND

see further details at www.otago.ac.nz/psychology/news/50thanniversary

Welcome

Welcome to the University of Otago for the 11th Annual Conference of the New Zealand Association for Behaviour Analysis (www.nzaba.org). We hope you enjoy the conference and your time in Dunedin.

Venue

The conference will be held in the William James Building in the Department of Psychology (street address: 275 Leith Walk) – see pages 3-4 for maps. Presentations will take place in the Psychology 200 Teaching Laboratory on Level 2. Morning teas, lunches, and afternoon teas will be held in the Psychology Staff Room on Level 1.

Parking in reserved University car parks is permitted outside of the hours of 7:30am – 5:30pm Monday to Friday. If you park in a metered park on Saturday, you will need to pay. Parking in metered parks is free on Sunday.

Registration and Fees

PLEASE NOTE THAT ALL ATTENDEES MUST REGISTER. We strongly recommend you pre-register online at www.nzaba.org prior to the conference.

The registration desk will be open at 8:00am on Saturday outside the room in which the presentations are being held. The cost of conference registration is free for students and $130 for all other attendees. Conference fees can be paid online prior to the conference or in person at the registration desk.

Optional social activity fees (for the Speight's Brewery Tour and Speight's Ale House conference dinner) must be paid by Saturday lunch-time. If you are paying online prior the conference, the cost is $32.50 per person for dinner, or $54.50 per person for the tour + dinner. If you are paying in person at the registration desk on Saturday, the cost is $35 per person for dinner, or $60 per person for the tour + dinner. For more information, see http://nzaba.org/conference/conference-details/pre-registration-and-conference-costs/

Social Activities

Friday 29th August:

There will be a Friday evening welcome event at Geoff White's house, from 5.30 - 9.30 pm for pizzas and drinks. Geoff's house is at 32 Littlebourne Rd, just above Moana pool (drive or walk up the driveway between the two large Sequoia trees). Walk up London St or Stuart St to get to Littlebourne Rd (see map on page 4).

Saturday 30th August:

Please note that these activities must be paid for by Saturday lunch-time (either online prior to the conference or at the registration desk).

Speight's Factory Tour at 6pm – this is a 90 minute tour of the Speight's Brewery. Please arrive 10 minutes before the start of the tour. See map on page 4 for location.

Conference Dinner at the Speight's Ale House at 7:30pm - This is a 2 course set menu. The Speight's Ale House is next door to the Speight's Brewery. If you are not going on the tour, please arrive 10 minutes before the start of the dinner. See map on page 4 for location.

For more information about the tour and dinner, see: http://www.thealehouse.co.nz/index.html

Instructions to Presenters

Paper Presentations: Each talk slot is 20 minutes so aim to present for 15 minutes and leave 5 minutes for questions. All presenters are asked to upload their talk to the computer prior to their session.

Poster Presentations: The posters need to be mounted on the walls in the Staff Room before lunch on Saturday. The poster sessions will be held in conjunction with lunch (12:20 – 1:20pm) and afternoon tea (3:00 – 3:20pm) on Saturday. Poster presenters should be available during these times to answer questions about their posters.

## Morning Tea, Lunch, and Afternoon Tea

These will be served in the staff room each day. The staff room is on the first floor at the end of the corridor (follow the signs). Vegetarian options will be available.

Department of Psychology Map

The conference will be held in the William James Building (green building on the map below). See the Dunedin map on the next page for the location of the Department of Psychology.
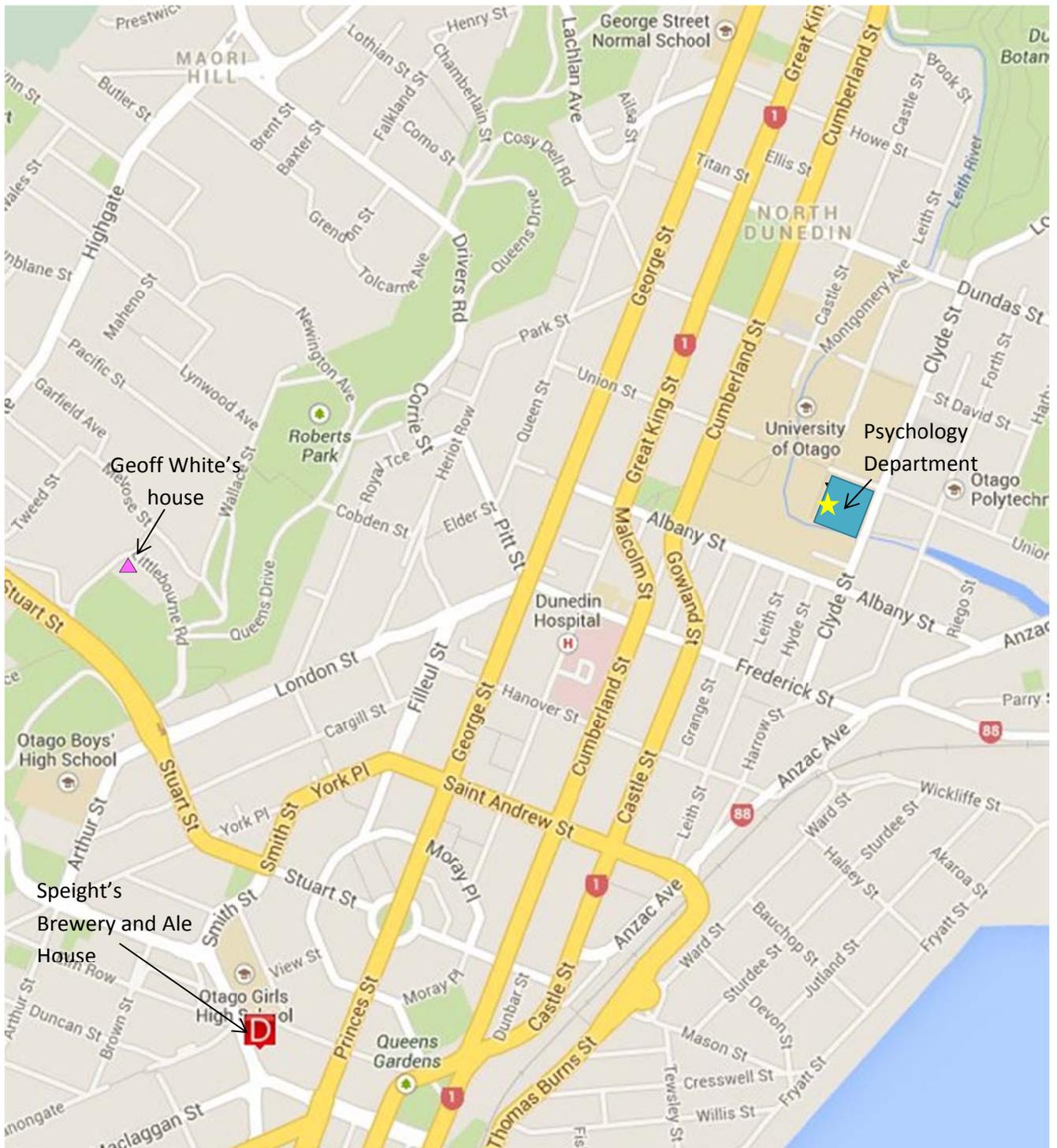
The conference will be held in the William James Building in the Department of Psychology. The location of the Department is marked with a blue square on the map above, and the William James Building location is marked with a yellow star (see the detailed department map on the previous page).

The Friday night social gathering will be held at Geoff White's house at 32 Littlebourne Road (marked with a pink triangle on the map above). There is a hill to walk up, so you may want to plan to taxi/carpool to get there.

The brewery tour and conference dinner on Saturday will be held at the Speight's Ale House (200 Rattray St, see "D" on the map above). The distance between the conference location and tour/dinner location is approximately 2.5km (around 30-40 minute walk).

NZABA 2014 Programme Overview

Friday 29th August

5:30–9:30 pm	Social gathering at Geoff White's house (32 Littlebourne Rd – see map)

Saturday 30th August

	8:00 am	Registration and Coffee	
SESSION 1	8:50 am	Welcome by Emeritus Professor Geoff White	
	9:00 am	Dave Harper	The Effects of 3,4-methylenedioxymethamphetamine (MDMA) on Reinforced Responding in Rats: Perseveration, Variation or Loss of Stimulus Control?
	9:20 am	Jack Staniland	The generation effect in pigeons (Columba Livia)
	9:40 am	Anthony McLean	Bouts of responses on variable interval schedules
	10:00 am	Kristie Cameron	The effect of geometric and arithmetic progressions on demand for food under concurrent progressive-ratio and fixed-ratio schedules
	10:20 am	Morning Tea	
SESSION 2	10:40 am	Emma Beeby	Pigeon Choice with Multiple Alternatives
	11:00 am	Joshua Bensemann	Local analyses of four-alternative choice
	11:20 am	Denys Brand	Sequential Analyses of Two Discrete-Trial Teaching Task Sequencing Procedures
	11:40 am	Katrina Phillips	Using calibration to assess observer training
	12:00 pm	John Church	The Influence of Applied Behaviour Analysis Research on Teaching Practice in New Zealand Schools
	12:20 pm	Lunch and Posters	
SESSION 3	1:20 pm	Anneke Jurgens	Procedural Integrity and Social Validity of the Picture Exchange Communication System
	1:40 pm	Angelika Anderson	EdAble Flower Power: Enhancing Engagement in the Workplace for Adults with ASD
	2:00 pm	Mitchell Stevenson	Teaching Job Skills to Adults with ASD: Efficacy of Video Modelling
	2:20 pm	Monica Carr	A sensitivity analysis of three nonparametric treatment effect scores for single-case research for participants with autism
	2:40 pm	Leah Smith	Point-of-View Video Modelling and Chaining: Teaching Children with Autism Spectrum Disorder to Write Their Name
	3:00 pm	Afternoon Tea and Posters	
SESSION 4	3:20 pm	Jane Fullerton & Vikki Bland	Signalled alternative reinforcement and resistance to change
	3:40 pm	Sarah Cowie	Contradictory signposts: What's a pigeon to do?
	4:00 pm	John Bai	Response rates and persistence after response-contingent food and additional stimuli
	4:20 pm	Ludmila Miranda Dukoski	Choice, timing and contingency discriminability
	4:40 pm	AGM	
	6:00 pm	Speight's Brewery Tour	
	7:30 pm	Speight's Ale House Dinner	

Sunday 31st August			
8:30 am		**Registration and Coffee**	
SESSION 5	9:00 am	Douglas Elliffe	New Caledonian crows adapt their tool manufacture to changing environmental demands
	9:20 am	Nick Farrelly	Concurrent choice behaviour and sensation seeking
	9:40 am	Surrey Jackson	The effect of body weight manipulation on the concurrent schedule performance of hens
	10:00 am	Tegan Andrews	Body Weight as a Motivating Operation: The effect of body weight on demand for food in hens
10:20 am		**Morning Tea**	
SESSION 6	10:40 am	Amarie Carnett	Effects of a Perseverative Interest-Based Token Economy on Challenging and On-Task Behavior in a Child with Autism
	11:00 am	Jessica McCormick	Using the Differential Outcomes Procedure to Teach Novel Tacts
	11:20 am	John Wooderson	A Systematic Review of Interventions for Improving the Work Performance of Direct Support Staff
	11:40 am	Melissa Janson	New Funding Developments in New Zealand and their Potential to Create Jobs for Behaviour Analysts
	12:00 pm	Brett Furlonger	"We happy few but why so few?" Redux
12:20 pm		**Lunch**	
SESSION 7	1:20 pm	Stuart McGill	Investigating Choice Behaviour and Local Effects of Reinforcement by combining EAB with EEG
	1:40 pm	Lorance Taylor	The effect of free spins on slot machine preference
	2:00 pm	Randy Grace	A Cumulative Decision Model for Three-Alternative Choice in Concurrent Chains
	2:20 pm	Anne Macaskill	How often do you make a plan to complete a certain study activity but then find yourself doing another, non-study activity instead?
2:40 pm		**Afternoon Tea**	
3:00 pm		**Awards and Farewell**	

Poster Presentations	
Rebecca Armstrong	An analysis of Killeen's (1994) Mathematical Principles of Reinforcement (MPR) parameters
Susan Baxter	Can patient-informed protocol affect self-efficacy for physical activity?
Sinead Bicknell	The relation between preference and price of different amounts of food with hens
Katrina Clarke	Brushtail possums (*Trichosurus vulpecula*) counting using response sequences under ratio reinforcement
Lauren Colls	What Prevents Distraction: Resistance of observing behaviour to disruption in humans
Katheryn Neilson	Losses Disguised as Wins in Slot Machine Gambling: The Effect of Reframing Outcomes
Stephanie Ng	Local-Level Resurgence in Extended Trials of the Free-Operant Psychophysical Procedure
Kim van der Toorn	The effect of economy type (open vs closed) on the demand for foods by hens
Lisa Wiles	The ability of two internal clock models to predict performance on a temporal bisection task

Complete Programme: Saturday 30th August

Session 1: EAB1 — Chair: John Bai

| 9:00am | **The Effects of 3,4-methylenedioxymethamphetamine (MDMA) on Reinforced Responding in Rats: Perseveration, Variation or Loss of Stimulus Control?** Harper, D. N. & Olsen, R. Victoria University of Wellington |

Over the last 10 years evidence has accumulated that the effects of acute MDMA on memory function in rats can frequently be attributed to an increase in 'response perseveration' (i.e. immediately preceding responses or sequences are likely to be repeated on a subsequent trial). However, not all procedures have yielded results consistent with this interpretation and typically the analyses conducted have been post hoc. The current study reports the results from Neuringer's 'reinforced variability' procedure that signalled to rats they would be either reinforced for repeating a sequence of lever responses versus reinforced for conducting a novel sequence of lever presses. Although we expected MDMA to increase perseveration (i.e. enhance performance on the 'repeat' trials and impair performance on the 'vary' trials) the pattern of effect was much more consistent with an overall increase in variability (i.e. impaired performance on the 'repeat' trials and improved performance on the 'vary' trials). This effect is not consistent with the perseveration-based account of impaired memory function following acute exposure to MDMA … which is a little bit of a shame … time for a new theory I guess …

| 9:20am | **The generation effect in pigeons (Columba Livia)** Jack Staniland & Mike Colombo University of Otago |

The generation effect states that information is processed more effectively if it is actively retrieved compared to passive observation. Monkeys display the generation effect (Kornell & Terrace, 2007). Here, we show the generation effect in pigeons. Pigeons were trained to respond to three-item pictures in a certain order for ten sessions. On some lists they had to generate the answer from memory (active condition) whereas on other lists a hint guided behaviour to the next correct stimulus (passive condition). On the 11 test session all hints were removed, or continued as normal if the subjects were on a list that didn't have hints. Performance was high during the ten sessions when hints were provided but fell to near-chance levels when hints were removed on the test session. When no hints were provided, performance was initially low but increased steadily across the ten sessions, and remained high on the test session.

| 9:40am | **Bouts of responses on Variable-Interval schedules** Anthony McLean[1], Rick Shull[2], Ray Pitts[3], Chris Hughes[3], Tracy Smith[4], & Jill Rau[5] [1]University of Canterbury, [2]University of North Carolina Greensboro, [3]University of North Carolina Wilmington, [4]University of Pittsburgh, [5]University of Western Ontario |

Log survivor analysis of rat interresponse times distinguishes two constituents of the observed IRT distribution. Both constituents are exponential distributions, and therefore differ on both the mean IRT and the variance of IRTs. The one with larger mean sand variance is a distribution of "pauses"; pauses separate bouts of responses. The other represents IRTs emitted while engaged with the reinforcement schedule, or "within-bout" IRTs. Bout initiation rate, bout length, and within-bout response rate are found to bear different relationships to different experimental variables such as

reinforcer rate. But this method fails with pigeon IRT distributions, which are much more complex. In this paper, we attempt an alternative approach where IRT distributions are modelled with gamma distributions, and within- and between-bout IRTs are distinguished on the basis of their variance. We find evidence of bouts, the parameters of which bear similar relationships to reinforcer rate as are commonly reported in rats.

10:00am	**The effect of geometric and arithmetic progressions on demand for food under concurrent progressive-ratio and fixed-ratio schedules** Kristie E. Cameron, Katrina H. Clarke, Lewis A. Bizo, & Nicola J. Starkey University of Waikato

The aim of this study was to compare performance of 12 possums under concurrent progressive-ratio and fixed-ratio schedules to investigate whether using different schedule and progression types would affect the determination of relative food preference. A progressive-ratio schedule was increased within (PR FR) or across sessions (PFR FR) and the alternative schedule remained constant. The progression of the incrementing schedule was also varied between a geometric sequence (basis 2), and an arithmetic sequence (step 5). The food pairs of berries and egg, and a barley mix and oats were tested. The parameters of the exponential (Hursh & Silberberg, 2008) and cross-price demand (Hursh, Madden, Spiga, DeLeon, & Francisco, 2013) models predicted estimates that differed in their description of demand across schedules, progression and food type. Cross points were the most stable measure and showed that when preferred foods were available under the incrementing schedule higher cross points were observed.

10:20am	**Morning Tea**

Session 2: EAB1 continued / ABA1   Chair: Anne Macaskill

10:40am	**Pigeon Choice with Multiple Alternatives** Emma Beeby & Brent Alsop University of Otago

Five pigeons were presented with three simultaneously available alternatives using a concurrent schedule. These alternatives were assigned to one of three reinforcer ratios, 9:3:1. The reinforcer ratios positions were counterbalanced across pairs of birds. In some conditions all three keys were available and in others only two keys were available. There were no significant differences in behaviour between the two and three key conditions. However, preference was more extreme for the pair of alternatives with the lower pairwise reinforcer rate (3:1) than the pair with higher rate (9:3), regardless of how many alternatives were available. This finding may be explained by the birds responding significantly less to the 9 alternative across all conditions. The birds did not show any preference pulses, they typically made their first response to the 9 alternative irrespective of the just-reinforced alternative. These findings differ from previous multiple alternative research.

11:00am	**Local analyses of four-alternative choice** Joshua Bensemann[1], Brenda Lobb[1], Christopher A. Podlesnik[2], & Douglas Elliffe[1] [1]The University of Auckland, [2]Florida Institute of Technology

A recent article by McLean et al. (2014) "Preference pulses without reinforcers" simulated responding in a 2-key environment. They demonstrated that a common finding in 2-key choice procedures, that an increase in short-term preference for the just-reinforced alternative could be partially explained by the method that data is arranged for local analyses. They suggested that previous research using local

analysis may be overestimating the local effects of reinforcement. We have replicated the simulation and extended it to produce data for 4-key environment and then compared it to real local data from two real 4-key datasets. Our simulation shows that run length parameters have the most influence over the results.

11:20am	**Sequential Analyses of Two Discrete-Trial Teaching Task Sequencing Procedures**
	Denys Brand, Oliver Mudford, & Douglas Elliffe
	The University of Auckland

Discrete-trial teaching (DTT) is used to teach academic and other skills to learners with intellectual disabilities. The discriminative stimulus (SD) is an antecedent stimulus during which the therapist provides the teaching instructions to the learner and is the distinct beginning of any discrete trial. Discriminative stimuli relate to tasks that are either in an acquisition phase or mastered. DTT task sequencing refers to the different procedures used to order SD to increase acquisition and maintain mastery. The DTT programmes for 6 therapist-learner dyads were investigated to compare two such procedures; concurrent (acquisition trials only), and interspersed (interspersing acquisition and mastered trials) training. Analyses investigating whether unprompted correct acquisition trial responses were more or less likely immediately following one or more mastered trials than they were following one or more acquisition trials were conducted. Collectively the results suggest that some learners may not be getting the full benefits of interspersed training.

11:40am	**Using calibration to assess observer training**
	Katrina Phillips, Oliver Mudford, & Douglas Elliffe
	The University of Auckland

Observers are integral to most measurement systems used in applied behaviour analysis and the need for observer training has been discussed since the 1960's. However, there has been little research on the topic and few published articles give details of their training procedure or criteria. The current study conducted pre- and post- training calibration analysis and three Interobserver assessments (block-by-block, exact agreement, and time-window analysis) for 4 novice observers who record the head-hitting and table banging of a man with intellectual disabilities. Once observers had meet training criteria the data from their in-vivo observations of the behaviours during baseline and intervention were assessed. The impact of training and the strengths and limitations of interobserver assessments and calibration will be discussed.

12:00pm	**The Influence of Applied Behaviour Analysis Research on Teaching Practice in New Zealand Schools**
	John Church
	University of Canterbury

The first applied behaviour analyses of children's learning in classroom settings appeared in mainstream academic journals during the first half of the 1960s. In the 50 years since then, some 2,000 applied behaviour analyses of classroom teaching variables have been published. Classroom settings have ranged from early childhood to upper secondary. Learning outcomes have included elements of attending, productivity, self-regulation, verbal behaviour, reading, writing, spelling, maths, science, social skills, and so on. In addition to experiments undertaken in mainstream classrooms, a further large but unknown number of applied behaviour analyses of teaching have involved learners in other settings and learners with extremely delayed language development. This paper addresses the following questions. To what extent has this very large corpus of well-controlled experimental research influenced teaching practices in New Zealand classrooms, the content of New Zealand's

	teacher education programmes, and the policies of the New Zealand Ministry of Education?
12:20pm	**Lunch and Posters**

Session 3: ABA2   Chair: Katrina Phillips

1:20pm	**Procedural Integrity and Social Validity of the Picture Exchange Communication System** Anneke Jurgens, Professor Dennis Moore, & Dr Angelika Anderson Monash University

While recent reviews of the Picture Exchange Communication System (PECS) research have provided support for the efficacy of PECS, they have also identified the need for future research to examine the long term maintenance of skills acquired through PECS training, as well as the social validity and procedural integrity of the intervention as used in practice. The aim of the present study was to examine the social validity and procedural integrity of parent implemented PECS in naturalistic settings, utilising three approaches: an analysis of YouTube videos, an internet survey, and a long-term follow-up. Results demonstrated a high rate of procedural errors in parent's implementation of PECS with their children in naturalistic settings and a lack of the long-term maintenance of skills acquired through PECS training, despite parents indicating that they believe PECS to be an effective and acceptable intervention and reasonably straightforward to implement. Implications of these results are discussed.

1:40pm	**EdAble Flower Power: Enhancing Engagement in the Workplace for Adults with ASD** Angelika Anderson & Sandhya Menon Monash University

The EdAble Flower Project is an ongoing research project conducted in the context of a not-for-profit social enterprise. The aims are to develop and pilot a training package to teach specific job-related skills to individuals with autism. Specifically this project explores the use of technology in training adults with autism to learn new skills and to manage themselves in a work environment. The project broadly consists of two parts: 1. Creating a safe and predictable context to facilitate participation and engagement; 2. Teaching job-specific skills to adults with ASD using modelling and self prompting procedures. This presentation describes the context of the project as a whole, including the vision of the not-for-profit social enterprise 'EdAble'.   Some preliminary data on part 1 will be presented then setting the scene for the presentation that follows.

2:00pm	**Teaching Job Skills to Adults with ASD: Efficacy of Video Modelling** Mitchell Stevenson, Shaun Pearl, Vanessa Rausa, & Simon Finkelstein Monash University

The EdAble Flowers program is a not-for-profit social enterprise designed to provide adults with an Autism Spectrum Disorder (ASD) with vocational training and employment in a business providing edible flowers for restaurants based in Melbourne. Video-based intervention packages and behavioural skills training packages both show moderate success teaching social and task based skills to children and adolescents with ASD. A group of independent researchers designed and developed intervention packages designed to train a range of skills; gardening, packaging, delivery and web management. Results across four unique participants indicate that video-modelling techniques are efficient at teaching a range of skills, while skill difficulty, task preference and heterogeneity of participant all appear to play mediating roles in learning abilities. As employee training videos are comparatively

easier to implement across a range of people than behavioural skills packages, this result provides a new hope for increasing postsecondary engagement in the growing ASD population.

2:20pm	**A sensitivity analysis of three nonparametric treatment effect scores for single-case research for participants with autism** Monica Carr Monash University

The widely used Percentage of Nonoverlap (PND) treatment effect calculation was compared to more recently developed methods which, it has been argued, better account for outlying variables and trend in single-case design intervention studies. Percentage of All Nonoverlap (PAND) and Nonoverlap of All Pairs (NAP) were selected for comparison as both are amenable to hand calculation, making them widely accessible to clinicians and teachers as well as researchers. A data set was developed through a systematic search of peer-reviewed literature on self-management interventions conducted with participants with autism spectrum disorder (ASD).   Treatment effect sizes derived from each method were compared for studies that provided sufficient data. Results indicated that PND provided a conservative measure of strength of treatment effect when compared to PAND and NAP scores. Interpretation scales for treatment effect scores derived from each method were reviewed. Implications for selecting a calculation method for participants with ASD are discussed.

2:40pm	**Point-of-View Video Modelling and Chaining: Teaching Children with Autism Spectrum Disorder to Write Their Name** Leah Smith, Sallyanne Marlow, & Nicholas Yap Monash University

The current study aimed to further investigate the effectiveness of point-of-view video modelling procedures in conjunction with chaining procedures, reinforcement and prompting, in teaching children with Autism how to write their name. Three children with Autism Spectrum Disorder; two males of five years of age and one female aged six years were recruited for this study. A multiple baseline across behaviours design was used treating each letter as a different behaviour to determine the effectiveness of the intervention package. At present, ongoing experiments preclude final conclusions from being formulated. However, existing data support the prediction that point-of-view video modelling combined with separate chaining procedures would be effective in teaching a child with autism how to write the letters of their name. Results thus far also support a second hypothesis that systematic replication of previous studies would be observed.

3:00pm	**Afternoon Tea and Posters**

Session 4: EAB2	**Chair: Surrey Jackson**

3:20pm	**Signalled alternative reinforcement and resistance to change** Christopher Podlesnik[1], Jane Fullerton[2], & Vikki Bland[2] [1]Florida Institute of Technology and [2]The University of Auckland

According to behavioral momentum theory, persistence depends on the overall reinforcer rate within a stimulus context. Therefore treatments used by applied researchers to decrease problem behaviour by concurrently reinforcing appropriate behaviour could inadvertently increase the persistence of problem behaviour. Treatments to decrease problem behaviour (e.g., Functional Communication Training) reinforce alternative desirable behaviour. These treatments signal the availability of alternative reinforcement. In animal studies, subjects prefer a schedule of signalled availability of reinforcement relative to an unsignalled schedule. Because preference and persistence have been shown to be positively correlated, the present study arranged signalled and unsignalled alternative reinforcement across two components and assessed persistence of target responding in each. We found no systematic effect of the signal on the persistence of target responding between components. This suggests signalling alternative reinforcement may not enhance persistence of target responding beyond the overall rate of reinforcement obtained in the presence of a stimulus context.

3:40pm	**Contradictory signposts: What's a pigeon to do?** Sarah Cowie, Michael Davison, & Douglas Elliffe The University of Auckland

Pigeons worked on a modified concurrent schedule where the local reinforcer ratio depended on both time since the last reinforcer, and on the location of that reinforcer. When the location of the most recent reinforcer was signaled by a keylight stimulus, choice was under strong control of the local reinforcer ratio during the stimulus presentation. When a keylight stimulus signaled the location of the next reinforcer, choice came under control of this stimulus, but control was weakened when the signalled location of the next reinforcer was different to the likely location of a reinforcer at that time. Thus, choice comes under the joint control of stimuli signalling contradictory information about the likely location of food.

4:00pm	**Response rates and persistence after response-contingent food** John Y. H. Bai[1], Douglas Elliffe[1], Sarah Cowie[1], & Christopher A. Podlesnik[2] [1]University of Auckland, [2]Florida Institute of Technology

Response-contingent stimuli can have a diverse range of effects on behavior when they are related with primary reinforcers. However, recent findings suggest that brief tones uncorrelated with reinforcement can enhance both the frequency and persistence of behavior. The present study investigated the generality of this finding with 16 pigeons in two-component multiple schedules. Both components arranged equal rates of food reinforcers on independent variable interval 60-s schedules. One component also arranged 0.5-s key-light colour changes on a separate VI 60-s schedule. Across multiple replications, no evidence was found to suggest that response-contingent stimuli systematically affect either the frequency or persistence of behaviour when uncorrelated with food. Furthermore, preliminary data from a follow-up study show inconsistent effects on both the frequency and persistence of behaviour even when stimuli alternate with food on VI schedules.

4:20pm	**Choice, timing and contingency discriminability**
	Ludmila Miranda-Dukoski & Douglas Elliffe
	The University of Auckland

Choice and timing processes interact: Choice only briefly tracks changes in local food ratios when those changes are complex. Thus, it is of interest to assess the extent to which the inability to discriminate local food-ratio changes might affect performance in already established procedures. In the current experiment, we replicated Jozefowiez et al.'s (2006) experiment, in which a single food on successively changing locations could be obtained in a trial. Some of the current conditions were different from those run by Jozefowiez et al. in that each time-to-food was associated with its own response key – easing the burden of tracking which key was currently locally richer. In these conditions, choice ratios resembled the obtained food ratios more closely than in conditions that were a direct replication of Jozefowiez et al. Thus, this experiment highlights that choice and timing processes affect each other, and models of performance in integrated choice-timing procedures ought not to treat them independently from each other.

4:40pm	**AGM**

Session 5: EAB3   Chair: Kristie Cameron

9:00am	**New Caledonian crows adapt their tool manufacture to changing environmental demands** Douglas Elliffe, Brenna Knaebe, Alex Taylor, & Russell Gray The University of Auckland

New Caledonian crows manufactured stick tools to extract food from a hole. They made either longer or shorter tools according to the requirements of variations of the task, and continued to do so even when they could not see the probe apparatus from the site of tool manufacture. We argue that their behavior implies causal mechanical understanding and not simply contingency-based learning, because the crows often failed to obtain food even with a correct tool, or succeeded even with an incorrect tool. We suggest that this audience has a critical role to play in the design of appropriate controls to eliminate mechanistic explanations of putative 'cognition' in the broad discipline of animal behaviour, and that the distinction between arranged and obtained contingencies is not well understood in animal behaviour and needs continual emphasis.

9:20am	**Concurrent choice behaviour and sensation seeking** Nick Farrelly & Brent Alsop University of Otago

Our personality is partly defined by how we behave. It stands to reason, then, that behaviour analysis can provide methods for systematically examining the behavioural manifestation of personality. Behavioural research examining personality and individual differences is scarce, however, and delay discounting has typically been used when these areas have been researched. The present study examined the association between concurrent choice preferences and sensation seeking – a personality trait associated with risk-taking behaviour– using a gambling-like task. Two experiments investigated how reinforcer magnitude, reinforcer frequency, response cost, and equal intermittent punishment influenced choice behaviour in sensation seekers, and how this choice behaviour varied during the task. Risk-taking behaviour following wins and losses was also analysed. The results and implications of the study, as well as possible avenues to explore in the future, are discussed.

9:40am	**The effect of body weight manipulation on the concurrent schedule performance of hens** Surrey M.K. Jackson, T. Mary. Foster, James S. McEwan, & Lewis A. Bizo University of Waikato

Motivating Operations (MOs) are frequently manipulated (by changing access to commodities and manipulating other variables such as body weight) in order to change the probability of responding. This study aimed to investigate the effect of altering body weight on concurrent schedule performance and to investigate the effect that altering body weight had on the durations of each component of the hens' peck response. Three hens held at 85% ± 5% were shaped via the method of successive approximations and three via autoshaping to respond for food reinforcers on a touch screen. Hens then worked for the same reinforcer under concurrent VI VI schedules across a range of reinforcer ratios with body weight held at 85% ± 5%, 95± 5% and 100± 5% in separate conditions. Results showed no consistent differences in concurrent schedule performance across body weights, in addition durations of peck components were consistent across body weights.

10:00am	**Body Weight as a Motivating Operation: The effect of body weight on demand for food in hens** Tegan Andrews, T. Mary Foster, & James S. McEwan University of Waikato

Demand for wheat and puffed wheat was examined with hens using increasing fixed-ratio schedules and 40-min sessions. Hens started Conditions 1 (wheat) and 2 (puffed wheat) at 80 ± 5% of their free-feeding body weights but sessions were conducted even if their weights moved beyond this range. In Conditions 3 (puffed wheat) and 4 (wheat) sessions were conducted only when the weights were within the specified range. There were differences in performance and in demand associated with food type. Although the weight criterion did not affect performance greatly, essential value differed over conditions. In Experiment 2 the strict weight criterion was maintained, sessions terminated after 40 reinforcers or 40-min, and both foods were used. Results showed that the performance of the fixed-ratio schedules was now similar for both foods, and the difference between the demand functions for the two foods was greatly reduced in comparison to Experiment 1.

10:20am	**Morning Tea**

Session 6: ABA3	**Chair: Monica Carr**

10:40am	**Effects of a Perseverative Interest-Based Token Economy on Challenging and On- Task Behavior in a Child with Autism** Amarie Carnett (Victoria University of Wellington), Tracy Raulston (University of Oregon), Russell Lang (Clinic for Autism Research Evaluation and Support, Texas State University), Amy Tostanoski (Vanderbilt Univesity), Allyson Lee (Texas State Univeristy), Jeff Sigafoos (Victoria Univeristy of Wellington) & Wendy Machalicek

We compared the effects of a token economy intervention that either did or did not include the perseverative interests of a 7-year-old boy with autism. An alternating treatment design revealed that the perseverative interest-based tokens were more effective at decreasing challenging behavior and increasing on-task behavior than tokens absent the perseverative interest during an early literacy activity. The beneficial effects were then replicated in the child's classroom. The results suggest that perseverative interest-based tokens might enhance the effectiveness of interventions based on token economies.

11:00am	**Using the Differential Outcomes Procedure to Teach Novel Tacts** Jessica McCormick The University of Auckland

The differential outcomes effect is a robust phenomenon whereby the use of response specific reinforcement enhances acquisition of conditional discrimination. This procedure was used to teach three children with autism to tact the names of musical instruments in response to that instrument's sound. For one set of instruments, response-specific reinforcers were used; for the other set, reinforcers were provided non-differentially. Two out of three participants showed enhanced learning in the differential outcomes condition, as demonstrated by faster acquisition and greater performance accuracy relative to non-differential outcomes. This provides some support for the differential outcomes procedures as a useful tool for teaching individuals with autism or learning difficulties.

11:20am	## A Systematic Review of Interventions for Improving the Work Performance of Direct Support Staff John R. Wooderson[1], Monica Cuskelly[1], & Kim A. Meyer [1]University of Queensland

An important focus of disability services is optimising the work performance of their staff members. A substantial body of literature is available to those who are responsible for ensuring that staff perform their roles adequately. The aim of this study was to systematically review this literature to determine the most effective approaches to improving staff work performance. Literature published between 1974 and 2013 were reviewed and 77 studies that met the criteria for inclusion were categorised according to type of outcome measure employed, intervention focus, and results. The findings suggest that interventions which focus solely on changing individual staff characteristics are less effective than approaches which seek to address problems in the work environment, often in combination with staff development. The present study provides important considerations for those responsible for improving the work performance of direct support staff.

11:40am	## New Funding Developments in New Zealand and their Potential to Create Jobs for Behaviour Analysts Melissa Janson University of Waikato

How do most people pay for Behaviour Therapy? Access to funding is crucial - it can determine whether people can or can't afford Behaviour Therapy. The Ministry of Health is changing some of the ways in which it will distribute funding for behaviour support (Ministry of Health, 2014). This presentation will explore the new avenues of Individualised Funding, Enhanced Individualised Funding, Enableing Good Lives, and The New Model. These new funding mechanisms aim to give back control and determination to people and families themselves. This approach has gained traction in New Zealand but has yet to gain more visibility in the disability environment to reach many more eligible people, in order to maximise their quality of life (InCharge, 2013). This session will provide a forum for discussion, including limitations of new models. With access to novel funding information, emerging Behaviour Analysts can collaborate with families, and create jobs for themselves.

12:00pm	## "We happy few but why so few?" Redux Brett Furlonger Monash University

Skinner's (1981) original presentation summarised the sentiments of many behaviour analysts who, while recognising the value of applied behaviour analysis to society also accepted that behaviour analysis occupied a smaller space in the academic and public arena than did other psychological approaches to understanding human behaviour. The limited influence of behaviour analysis on the wider community has continued to the present day. Schlinger (2010) has suggested, that "… we cannot shape the developmental course of our field, and that, like evolution by natural selection at the biological level, the evolution of behaviour analysis, whether in research or application, is subject only to selection by the culture". If this is so, then what do we need to understand about how the power of culture shapes public understanding and what can we do to increase the variations in the application of behaviour analysis that may result in increased chances of cultural selection? Three environments will be examined, whose current designs give an indication as to why 'we are so few', and what we need to do.

12:20pm	**Lunch**

Session 7: EAB4	Chair: Emma Beeby

1:20pm	**Investigating Choice Behaviour and Local Effects of Reinforcement by combining EAB with EEG** Stuart McGill, Douglas Elliffe, & Paul M. Corballis The University of Auckland

The effect of reinforcement on human two-alternative-choice behaviour was investigated via a discrete-trials design. Relative reinforcer probability varied from 3:1, 1:1 and 1:3. Non-rewarding stimulus events (non-rewards) were non-contingently presented at a rate matching the reinforcers. Electroencephalography was used to assess any differences between event related potentials (ERP) evoked by reinforcers versus non-rewards, as well as any effect of the differential frequency of reinforcers and non-rewards. Previous electrophysiological studies implicate the ERPs reward-positivity and the P300 as neural correlates of reward. To examine the effect of the reinforcer ratios on response preference, the cumulative difference between response and reinforcer imbalances was submitted to a change point analysis (Gallistel et al. 2004). Behavioural results were consistent with previous findings suggesting that the participants altered their response preference to approximate their obtained reinforcer imbalance. However, ERP results were inconsistent with studies of reward, suggesting the absolute rate of reinforcers modulate corresponding ERP.

1:40pm	**The effect of free spins on slot machine preference** Lorance Taylor, Anne Macaskill, & Maree Hunt Victoria University of Wellington

Slot machines are the primary mode of gambling for around ¾ of problem gamblers, yet are played by fewer people than other gambling activities like Lotto, or Instant Kiwi. Structural characteristics of gambling activities are an important factor in determining gambling behaviour. One feature of slot machines that has received no experimental analysis is the "bonus feature" or "free spins" that are commonly central to machines' designs. We investigated the free-spins feature using an experimental design with slot-machine simulations, to see whether participants preferred a machine that has a free-spins feature. Participants preferred a machine with free spins, but only when the free spins incorporated additional features such as sounds, animations, and an increased win frequency. Future research could look at the relationship between free spins and players' betting strategies, such as whether the presence of free spins influences the number of lines bet or the amount of money wagered.

2:00pm	**A Cumulative Decision Model for Three-Alternative Choice in Concurrent Chains** Randolph C. Grace & Anthony P. McLean University of Canterbury

The vast majority of research on behavioural choice with nonhumans has used procedures with just two response alternatives. The apparent rationale has been that binary procedures are sufficient to isolate the fundamental principles which determine choice, but is this assumption valid? Here we test if the cumulative decision model (Christensen & Grace, 2010), developed for two-alternative choice in the concurrent-chains procedure, can apply without modification to three-alternative choice, and compare its predictions with those of the hyperbolic value-added model (Mazur, 2000). Two experiments and a residual meta-analysis of previously published studies are presented. Results show that the cumulative decision model provides an excellent account of the data, superior to the hyperbolic value-added model, confirming that the principles which explain binary choice generalize to choice with three alternatives.

2:20pm	**How often do you make a plan to complete a certain study activity but then find yourself doing another, non-study activity instead?**
	Anne Macaskill & Maree Hunt
	Victoria University of Wellington

How useful is it to think of spending time studying as a self-control dilemma for students? This study investigated this question while testing a novel delay discounting task using video clips as reinforcers. Students reported that they regularly spent less time studying than they initially intended (preference reversal) and attributed disappointing marks to a lack of time studying. These responses were not correlated with delay discounting for hypothetical money or experienced video clips. We asked students to evaluate interventions that course coordinators could implement to increase the likelihood that students choose larger, but delayed reinforcers that result from studying. Impulsivity was weakly related to negative evaluations of the usefulness and desirability of these interventions.

2:40pm	**Afternoon Tea**
3:00pm	**Awards and Farewell**

Poster Presentations

Posters will be presented at lunch and afternoon tea times on Saturday in the Staff Room.

An analysis of Killeen's (1994) Mathematical Principles of Reinforcement (MPR) parameters

Rebecca Armstrong

University of Waikato

Mathematical principles of reinforcement (MPR, Killeen, 1994) uses three principles: (1) The qualities of a reinforcer will affect the probability of responding (specific activation; a in the model). (2) Time and energy constraints result in response rate limitations (constraint; δ) and (3) Reinforcement only occurs to the extent that responses are associated with reinforcers (Coupling; c). It was assumed that increased force would affect constraint, δ, and increased access to food would increase activation, a. Five hens responded on a geometric Fixed Ratio (FR) schedule in three conditions; low force (0.24N/2s access), high (1.1N/2s) and high force plus increased reinforcer duration (1.1N/4s access). Response rates were well described by a bitonic function as predicted by the model. Response rates were higher when the force requirement was low. Doubling the reinforcer duration had no effect on response rates. Interestingly a was most effected by the increase in force requirement. While the a parameter was not affected by the increase in the magnitude of the reinforcer.

Can patient-informed protocol affect self-efficacy for physical activity?

Baxter. S V; Hale LA; Smith CS; Stebbings S; Gray., A; Treharne, GJ.

University of Otago

Rheumatoid arthritis (RA) is a chronic disease that causes joint pain. Regular participation in exercise could assist people with RA manage their symptoms which contribute to disability, and avoid secondary conditions like heart disease. However, it is hard for people with RA to participate in exercise. In various behavioural models the conflict between intention and action is predicted by self-efficacy. A qualitative study (telephone interviews) informed the subsequent physical activity protocol for a between-participants experiment. Thirty patients were randomized to either a control group (20) or a walking group (10), and barriers and facilitators were addressed where possible. People with RA were feasibly able to regularly engage in exercise the suggested frequency over 6 weeks and self-efficacy for physical activity was increased in the walking group only (albeit not significantly). The subtle change in self-efficacy is promising for addressing patient identified concerns for exercise participation in an acceptable and simple program.

The relation between preference and price of different amounts of food with hens

Bicknell, S., Foster., T.M & McEwan., J.

University of Waikato

Does preference change with price? Concurrent-chain schedules have been used to examine how preference may relate to demand. Bruce (2007) showed (with six domestic hens) that wheat was generally preferred to puffed wheat. As the schedule requirement was increased on a FR schedule in the terminal links of the concurrent-chain, the hen's preference for wheat became more extreme. This finding suggested that there is a systematic relation between preference and schedule requirement. The current experiment aims to replicate Bruce (2007) concurrent-chain schedules of reinforcement using different magnitudes of wheat reinforcement (2, 8 and 4 sec access). It will test if preference for a commodity can be measured when two commodities are available concurrently. It also seeks to see if preference will change as the overall FR requirements are increased.

Brushtail possums (*Trichosurus vulpecula*) counting using response sequences under ratio reinforcement

Katrina H. Clarke, Lewis, A. Bizo, & James S. McEwan.

School of Psychology, The University of Waikato

The aim of this study was to replicate the 'Mechner Counting Procedure' and conduct a variety of conditions to determine whether possums have the cognitive ability to count. Previous research has shown that animals are able to count the amount of responses they make and the number of light flashes that occur. Six brushtail possums participated in three conditions where FR responses were required to gain access to food reinforcement. Reinforcement was delivered either upon the completion of an FR response requirement on lever A, or on the completion of the FR on lever A, followed by an additional response on lever B. The results have shown that the possums do have the cognitive ability to count the number of responses they make. The mean response on lever B typically occurred slightly above the FR response requirement across conditions.

What Prevents Distraction: Resistance of observing behaviour to disruption in humans

Lauren Colls, David Harper, Maree Hunt, & Anne Macaskill

Victoria University of Wellington

We examined observing responses by humans playing a computer game in the context of behavioural momentum theory. Periods of extinction alternated with periods of rich or lean variable interval reinforcement; observing responses produced stimuli indicating which schedule was in place. Observing responses were manual in Experiment 1 and ocular in Experiment 2. We investigated 1) Rates of observing responses (OR) and reinforcement responses (RR) under extinction and rich and lean VI 2) Resistance to disruption of OR under rich and lean VI. In both experiments, participants responded at a higher rate during VI than extinction but there were inconsistent effects of schedule richness. The average rate of OR was higher during periods of extinction and in the lean component. There was little disruption of manual observing in either component while there was greater resistance to disruption of ocular observing in the rich component. This provides tentative support for a behavioural momentum account of observing but replication with a more reliable disruptor is required.

Losses Disguised as Wins in Slot Machine Gambling: The Effect of Reframing Outcomes

Katheryn Neilson, Dr Maree Hunt, & Dr Anne Macaskill

Victoria University of Wellington

In multiline slot machine gambling, a loss disguised as a win (LDW) occurs when a player "wins" a sum of money that is less than the original wager. Following LDW's, players exhibit behaviours associated with winning rather than losing. This may occur because slot machines frame LDW's as wins, with similar sounds, animations and outcomes descriptions. The current study investigated one of these framing elements – the words used to describe wager outcomes. Participants were exposed to two simulated slot machines. The STANDARD machine worded LDW's as wins whilst the LOSS machine described LDW's as losses. It was predicted that participants would prefer the STANDARD machine, however there was no preference for either machine when return to player was held constant. The results suggest that interventions regarding the wording of wager outcomes would do little to reduce problem gambling.

Local-Level Resurgence in Extended Trials of the Free-Operant Psychophysical Procedure

Stephanie Ng (University of Auckland), John Y. H. Bai (University of Auckland), Sarah Cowie (University of Auckland), Christopher A. Podlesnik (Florida Institute of Technology)

Reinforcing an alternative response while extinguishing a target response is a commonly-used procedure for decreasing problem behavior. However, target responding may relapse when alternative reinforcement is discontinued (i.e., resurgence). The present experiment examined local-level resurgence using a modified free-operant psychophysical procedure (FOPP). In baseline sessions, left-key responding was reinforced intermittently in the first 25 s of each 50-s trial, and right-key responding was reinforced in the last 25 s of each trial. In FOPP trials extending beyond 50 s, no reinforcers were arranged, and left-key responding resurged after 50 s. Moreover, a 5-s stimulus change occurring at the 50-s time mark produced even greater resurgence. These results are consistent with previous findings that greater relapse occurs when contextual changes are more discriminable. These findings reveal additional evidence that time and discrete stimuli play a role in defining stimulus context.

The effect of economy type (open vs closed) on the demand for foods by hens

Van der Toorn, K., Andrews, T., Foster, T.M., & McEwan, J.

University of Waikato

The present study examines the amount of time hens are given access to responding in a day and its effects on consumption across Wheat and Puffed Wheat. Demand was assessed using increasing fixed ratio schedules, with sessions terminated after 40 reinforcers or 40 min. Body weight was held close to 80% of free-feeding weight in an open economy. Demand functions were very similar for the two foods in comparison to other open-economy studies, where sessions terminated after 40 minutes. Thus, session termination criteria affect the shape of the demand function. The parameters of the fits of different demand functions will be presented. The next conditions use a closed economy with each food and with long (9 hour) sessions and body weight free to vary. These data are presently being collected and will be compared with the demand functions from the open economy data sets.

The ability of two internal clock models to predict performance on a temporal bisection task

Lisa Wiles, Lewis A. Bizo, & James S. McEwan

University of Waikato

This research tested the ability of two competing models of animal timing, Learning to Time (LET) and Scalar Expectancy Theory (SET), to predict hens' performance on a temporal bisection task, in a replication of an experiment by Machado and Keen (1999). Hens were trained in two temporal discriminations; in Type 1 trials they learned to choose a red key after a 1-s signal and a green key after a 4-s signal and in Type 2 trials they learned to choose a green key after a 4-s signal, and a yellow key after a 16-s signal. After they learnt these discriminations, intermediate durations were presented. The resulting psychometric function did not superpose, violating the scalar property of timing. When novel key and duration combinations were presented and performance on subsequent generalisation tests closely matched LETS predictions. Overall, the results support the findings of Machado and Keen (1999) and supported LET's rather than SET's predictions.