3rd Annual Meeting of
New Zealand Association for Behaviour Analysis

Saturday 2nd Sept to Sunday 3rd Sept 2006

Venue:
Homestead
Ruakura Research Centre
Ruakura Rd.
Hamilton

Saturday 8:50 Welcome

Session 1: Preference and Choice Chair: Doug Elliffe

The relation between preference and demand for litter in hens.

Aimee Harris, Cath Sumpter,
Bill Temple, Mary Foster,
Nicola Starkey

The University of Waikato

Six hens’ preferences between 5-min access to each of two litter substrates, sand and sawdust, were measured using a concurrent schedules procedure. The obtained preferences were small and idiosyncratic. Demand functions were generated separately for each of the two substrates by requiring the hens to perform under increasing FR schedules. The demand functions were disorderly, some were linear, some were of mixed elasticity, and others curved upwards. The aim was to assess whether the demand functions for the more preferred litter substrate (as determined by the concurrent schedules) yielded higher initial consumption rates, less elastic demand functions and/or higher $P_{\text{max}}$ values when compared to the demand functions generated for the less preferred substrate, as has been found for qualitatively different foods. However, no clear relation between the individual hens’ preference and demand measures was found.

Sound preferences of hens using multiple concurrent schedules

Amy Tannahill Cath Sumpter,
Bill Temple, Mary Foster

The University of Waikato

In this study, six hens responded under equal independent multiple concurrent variable-interval schedules of reinforcement with an overlaid sound associated with one key. The key that the sound was associated with was alternated between components. In the first condition there was no sound, and the sound used over the following conditions was varied over conditions. The current results will be presented and discussed.
The Relation Between Preference and Demand at Varying Prices.

Julie-Anne Bruce, Cath Sumpter,
Bill Temple, Mary Foster,
Nicola Starkey

The University of Waikato

Six hens’ demand for, and preference between wheat and puffed wheat were examined using increasing fixed ratio schedules and concurrent chain schedules, respectively. The aim was to assess if demand functions could be used to predict preference. Demand functions of mixed elasticity were generated for each of the food types. The various measures of demand ($a$, $b$, and $P_{\text{max}}$ values, and break points) were higher across all subjects for wheat except for initial ($\log L$) levels of demand, which, counterintuitively, were higher for puffed wheat. Concurrent chain schedules were used to assess preference at prices of FR1, FR8 and FR32. The subjects showed a preference for puffed wheat during the terminal link at a price of FR1. Five of the subjects preferred wheat in all of the initial links, but one preferred puffed wheat at FR8.

Prenatal nutrition influences learning and preference between exercise and food

C. U. Krägeloh, M. Davison,
J. Landon, J. L. Miles,
N. M. Thompson, & B. H. Breier

National Research Centre for Growth and Development
The University of Auckland

Intrauterine growth restriction due to undernutrition during fetal development can lead to significant long-term health consequences, such as metabolic and cardiovascular disorders, but less is known about its effects on behaviour in adult life. In several independent studies, we investigated the long-term effects of prenatal undernutrition in the rat, on learning in a frequently changing environment (Davison & Baum, 2000), and preference for food versus exercise. Offspring of mothers undernourished during pregnancy learned less and showed a relatively higher preference for exercise over food than control rats. These findings will be discussed by reference to the theory of predictive adaptive responses according to which pathways of fetal development are initiated during early life based on predictions about postnatal environmental conditions.

Saturday 10:20 - 10:40 Morning Tea

Is body fat a free lunch?

Lindsay Matthews\textsuperscript{1}
Debbie Davison\textsuperscript{2}

\textsuperscript{1} AgResearch, PB 3123, Hamilton
\textsuperscript{2} Dexcel, Hamilton

The body condition (fat depots) of dairy cattle varies greatly between individuals and over the production cycle. The common perception is that lower conditioned animals are poorly fed and have a high requirement for additional feed. The food requirements of dairy cattle at each of two different body condition scores (BCS) at two stages of the production cycle (late lactation and late pregnancy) were quantified using behavioural economic demand curves. Six cows in each treatment (BCS 4 and 5) worked for all their daily forage requirements in closed economy 24h sessions on FR1 schedules. Price was varied across conditions by altering the duration of forage access. Counter-intuitively, demand for food was higher in the better conditioned animals, suggesting that body fat does not provide a free lunch.
Sakartvelos Bavshvebi: Developing Applied Behaviour Analysis in Georgia

Barry S Parsonson
Jane Mary Rawls

Sakartvelos Bavshvebi (Children of Georgia) 
NGO, Tbilisi, Georgia

Sakartvelos Bavshvebi has been involved in the development of Applied Behaviour Analysis in Georgia for 9 years, with special needs and institutionalized children as its primary focus. Its activities have included university teaching and practicum training, providing library resources (including an introductory manual in Georgian as a teaching resource), funded professional development opportunities for Georgians in New Zealand and the USA and established university curricula. Former trainees and the new generation of students are establishing a variety of applications, such as inclusive education programmes at pre-school and school level, programmes for children in institutions to prepare them for community living, and interventions with children with behaviour disorders. This paper traces the journey and looks to future developments.

Multisystemic Therapy (MST): Does applied behaviour analysis fit?

Eric Messick

Youth Horizons

MST is an evidence-based model of service delivery for young people engaging in antisocial behaviour. It is based on social-ecological models of behaviour that suggest that the causes of behaviour are within the systems in which the young person is embedded: home, school, community, etc. Interventions target the causes of antisocial behaviour and build more appropriate behaviour across approximately 4 months of family/whanau involvement. The model will be discussed as it is being used in NZ and fits well with applied behaviour analysis.

The relative effects of fluent versus accurate practice on the acquisition, maintenance and generalisation of functional word reading.

Ainsley Darvell

Dennis Rose

The University of Auckland

The cause of the perceived success of fluency-based teaching methods has rarely been empirically evaluated, despite 30 years of its use. This study taught four adults with mild intellectual disabilities to read a set of self-selected functional words. They were taught under two conditions: fluency and accuracy. The fluency condition required participants to practice reading a set of 15 words as quickly as possible. The accuracy condition required the participants to practice a set of 15 words slowly and accurately. Generalisation and maintenance tests were conducted at 2, 4 and 8 weeks after training concluded. The results from an alternating treatments design showed that both methods produced acquisition and maintenance but that the fluency condition produced better generalisation.
To contrast two models of timing, Scalar Expectancy Theory (SET) and Learning to Time (LeT), that make substantially different predictions about how animals learn temporal tasks, we used a variation of a double temporal bisection procedure. Pigeons learned two discriminations, which were presented within sessions: on Type 1 trials, they learned to choose a red key after a 1-s signal and a green key after a 4-s signal; on Type 2 trials, they learned to choose a blue key after a 4-s signal and a yellow key after a 16-s signal. Then, pigeons were exposed to intermediate durations, (1 s to 4 s on Type 1 trials and 4 s to 16 s on Type 2 trials) and given a choice between novel key combinations (e.g. red vs. blue). Results were very similar to those one obtained when both types of trials were presented in the same session and they were closer to LeT than to SET’s predictions.

Effects of Initial-Link Duration in a Rapid Acquisition Concurrent-Chains Procedure

Pigeons were trained in concurrent-chains procedure in which the left terminal link was always fixed-interval (FI) 8 s and the right terminal link was changed between FI 4 s or FI 16 s across sessions according to a pseudorandom binary sequence (Grace, Bragason & McLean, 2003). Across conditions, the initial-link schedule was either short (variable-interval [VI] 5 s) or long (VI 30 s). For all subjects, sensitivity to the current session terminal-link immediacy ratio was greater when the initial links were short than when they were long. We propose a version of Grace and McLean’s (2006) decision model that can account for the results.
Model comparisons in a rapid acquisition design.

Darren Christensen
Randolph Grace
The University of Canterbury

8 pigeons experienced a concurrent chains rapid acquisition design where the left terminal link (TL) remained constant at 8 seconds while the right TL followed an evenly spaced ascending and descending sequence. Each sequence was replicated 3 times with order counterbalanced across birds in each group of 4 birds. We found evidence of hysteresis in both the ascending and descending sequences. In addition, subjects showed stronger sensitivity to shorter delays than longer delays, indicating a TL effect. There was even some evidence of categorical discriminations. An extended version of Grace and McLean’s (2006) decision model is proposed which includes an exponentially weighted moving average criterion and an across-session learning parameter. This model was able to describe our data better than either a simple linear operator model (Grace 2002), or the Generalized Matching Law (Baum, 1974). These three models are discussed in terms of their descriptive power and complexity.

The Number Crunch: Counting, Variability and Numerical Reproduction

Lavinia Tan
Randolph Grace
The University of Canterbury

Significant numerical control over behaviour, above and beyond control by temporal cues, has previously been obtained in a numerical reproduction procedure with both temporally regular and irregular stimuli. But were these pigeons really counting? A hallmark of both timing and nonverbal counting processes is scalar variability in responding. Variability increases proportionally with response number, resulting in constant coefficients of variation (CVs). Pigeon CVs in the numerical reproduction procedure decreased as the inverse square root of average response number, consistent with CVs obtained in human verbal counting. We investigated temporal patterning of responding as a possible explanation for this, and developed category learning model that describes performance in the task.

Stimulus correlations override reinforcer relations in producing equivalence classes

Douglas Elliffe,
Sara Minster
The University of Auckland

We arranged a many-to-one training procedure that used class-specific incorrect comparison stimuli. That is, trials with either Ax or Cx as a sample stimulus always arranged a comparison array of Bx-Gx-Hx, and choices of Bx were reinforced. Tests for the relations of symmetry (Bx→Ax and Bx→Cx) and equivalence (Ax→Cx and Cx→Ax) demonstrated the emergence of three three-member (AxBxCx) equivalence classes for almost all subjects. In two separate experiments, we then either overtrained the baseline conditional discriminations and then ran a second series of test trials, or proceeded directly to the second test phase. In the second series, we tested for the emergence of relations between the trained sample (Ax and Cx), comparison (Bx) and class-specific incorrect (Gx and Hx) stimuli. Some of the non-overtrained subjects, and all the overtrained subjects, responded consistently with the emergence of three five-member equivalence classes (AxBxCxCxGxHx). That is, subjects chose stimuli that had been correlated with other stimuli during training even when choices of those stimuli had been explicitly not reinforced. Stimulus correlations are evidently more important than operant contingencies in establishing equivalence classes.
Investigations of Picture/Object Equivalence in Hens

Renee Railton, Bill Temple, Cath Sumpter, T Mary Foster

The University of Waikato

In animal research, two dimensional pictures have been used to represent three dimensional objects. There is, however, relatively little research on whether animals can or do interpret two dimensional stimuli as the three dimensional objects they represent and the results of this research are often conflicting. This paper will report a series of experiments that attempted to determine whether hens, having learned a discrimination between objects (or between photographs of the objects), can generalize the discrimination to the photographs of these objects (or to the objects). The results will be presented and discussed in light of their implications for assessing two dimensional/three dimensional equivalence in hens.

Saturday 3:30 - 3:50 Afternoon Tea

Why 4-alternative choice is interesting

Michael Davison, Christian U. Krägeloh, Mhoyra Fraser, and Bernhard H. Breier

National Research Centre for Growth & Development
Department of Psychology
The University of Auckland

Two groups of 10 male rats were trained to nosepoke for food pellets at 4 alternatives that provided differing rates of pellet delivery on aperiodic schedules. After a fixed number of pellets had been delivered, 5, 10 or 20 in different conditions of the experiment, a 10-s blackout occurred, and the locations of the differing rates of pellet delivery was randomized for the next component. Two groups of rats were used: The AD group consisted of 10 rats born to dams that had normal (ad libitum) nutrition during pregnancy, while the 10 rats in the UN group were from dams exposed to reduced food availability during pregnancy. All pups received normal nutrition after birth. Choice between the nosepoke alternatives quickly adapted when the rates of pellet delivery were changed in both groups, but there were no consistent differences in the speed of adaptation between the 2 groups. The generalized matching relation failed to describe the allocation of responses between alternatives, but the contingency-discriminability model provided a precise description of performance.

Smart heuristics that make life simple: response allocation when reinforcement varies on multiple dimensions in concurrent chains

Elizabeth Kyonka, Randolph Grace

The University of Canterbury

When terminal-link schedules are arranged according to a pseudorandom binary sequence, pigeons track changes in reinforcement immediacy across sessions (Grace, Bragason & McLean, 2003). We investigated whether they are able to track changes to multiple dimensions of reinforcement. In Experiment 1, the initial-link alternatives associated with the shorter delay and the larger reinforcement magnitude were determined across sessions by independent random series. In Experiment 2, immediacy, magnitude and probability of reinforcement varied randomly and independently. Multiple regression analyses showed that pigeons were able to track all three simultaneously. This result is compatible with two interpretations: either pigeons integrate information about all cues every session, or on any given session they exclusively prefer the richer alternative for a single, stochastically selected dimension, ignoring any other(s). We conducted analyses of within-session acquisition to investigate which interpretation was supported by the data.
Extinction-induced variability in human behaviour.

Jennifer Kinloch,
James McEwan
Mary Foster.

The University of Waikato

Increased behavioural variability is a known product of extinction, however, there have been few human experimental studies done in this area. The five experiments in this study involved a computer task where participants received points (by either pressing the space bar or drawing rectangles with the mouse) contingent upon either the inter-response time (DRL schedule) or the size of the rectangle. Experiment 1 was a replication of Morgan and Lee (1996). Experiment 2 altered the response requirement, and Experiment 3, the reinforcement contingency. Experiments 4 and 5 were replications of Experiments 2 and 3, respectively, but with the provision of more specific instructions. Variability was always greater during extinction on the reinforced dimension. The effect on the non-contingent dimension varied. The results suggested effects of reinforcement history and instructional specificity.

Human signal detection and punisher control?

Celia Lie

The University of Otago, Dunedin, NZ

McCarthy and Davison (1984) identified two different response bias functions using a signal-detection procedure with pigeons. When stimulus disparity was varied with constant, controlled reinforcer ratios, isobias functions were found. However, when stimulus disparity was varied using uncontrolled reinforcer ratios, allobias functions were found. Johnstone and Alsop (2000) systematically replicated this finding using human subjects. The present study investigated bias functions from human subjects when constant, controlled punisher ratios were arranged at different levels of stimulus disparity.

An animal analogue of gambling and the 'near miss' phenomenon

Kevin Greig, Maree Hunt,
Dave Harper

Victoria University of Wellington

One aspect of human slot machine gambling that has not been thoroughly studied using an animal analogue is the 'near miss' phenomenon. Near misses can be defined as “failures that are close to being successful” (e.g., having 4 cherries appear on a slot machine when 5 are required for a payout). Some evidence suggests that the response latency to initiate a new trial (i.e. insert more money into a slot machine) is longer following a 'near miss' trial compared to a 'clear miss' trial (e.g., if 1 cherry appeared in the preceding trial). The longer latency following a near miss trial is consistent with a view that near miss trials possess some of the reinforcing properties of 'win' trials (i.e., a relatively long latency following a 'win' trial). A number of theories within the gambling literature attempt to explain the near miss phenomenon using various indirect (typically cognitively-based) mechanisms. From a behavioural perspective the “near miss” effect may be viewed as a product of stimulus generalisation, conditioned reinforcement or a form of response generalisation based on prior learning histories. We developed a rat-based paradigm that possessed many of the structural aspects of a human slot machine gambling situation and examined whether we could replicate the near miss phenomenon (‘yes’ we did). Subsequent analysis suggested that in the rat analogue this effect was a product of stimulus generalisation and thus may not capture the same phenomena seen in human behaviour.
Saturday 7:00  Dinner Sahara Tent 254 Victoria st.  (078340409)

Sunday 8:50  Remorse

Session 1: *Dogs at Work*  
Chair: *Mary Foster*

**Sun 9:00**

**Odour capture for landmine detection by dogs**

Rebecca J. Sargisson  
Ian G. McLean  
Geneva International Centre for Humanitarian Demining (GICHD) & The University of Otago

Unlike traditional methods of mine detection in which the detector is taken into the minefield, *Odour Capture* (OC) brings the minefield to the detector, using filters. The technique has been in use since 1993, but was poorly researched. In 2002, a mine-action programme in Angola sought help from the Geneva International Centre for Humanitarian Demining to save a stagnant OC programme. During a two-year intervention (2003-5), the entire programme was re-evaluated and rebuilt, with considerable improvement in training and testing results. However, in 2005 all 12 dogs failed a key test, involving detection of novel odour of mine. The failure to generalise accurate performance to novel stimuli has serious implications for the applicability of OC as a mine-detection technology. Solutions focused on creating greater variability in training stimuli.

**Sun 9:20**

**Directional Tracking in Police Dogs**

Janine Locke,  
Doug Elliffe  
The University of Auckland

A large part of police dog work involves tracking offenders or lost persons. The ability to determine the direction of a track is often assumed to be an innate ability of dogs, and therefore has been subject to little research. We investigated the ability of police dogs to determine the correct direction of 10 human-laid tracks. Turning behaviour and tracking time was analysed with respect to the dog’s age, level of training and operational experience. Preliminary findings will be discussed.

**Sat 9:40**

**Weed Sniffer dogs**

Ian Popay  
Northern Regional Office  
Department of Conservation

When attempting to eradicate weeds from a site, finding every last individual is difficult. At present it is done by intensive human searches, which are difficult in rugged terrain or where weeds are cryptic. Biosecurity beagles regularly detect vegetable matter in luggage. Dogs could probably be similarly trained to detect individual weed species even where the plant is growing in dense bush or difficult terrain. This project aims to see if trained dogs can find all the individuals of a species. Further refinement would be to test if a dog can find and indicate more than one species of weed at a site. The concept is already under trial in Montana, USA. This technology could revolutionise weed eradication from islands, or other discrete locations.
Sunday 10:00 - 10:20 Morning Tea

Session 2: Applied Behaviour Analysis (2)  Chair: Dave Harper

Increasing the Range of Play Activities Using Premack’s Principle and Activity Schedules

Katrina Phillips
Dr. Angela Arnold-Saritepe  The University of Auckland

The intervention was designed to increase the range of play activities that a 13 year old boy with Down syndrome engaged in during playtime. Play activities were ranked according to Premack’s principle. Phase 1 of the intervention required the completion of 10 minutes of his least preferred activity with no non-compliant behaviour before access to playdough, the most preferred activity, was granted. Each subsequent phase added another activity that was more preferred than the previous activity but less preferred than playdough. By the end of the intervention DM engaged in four other activities for 12 minutes each prior to playing with playdough. The stimulus control of the behaviour was then transferred from adult prompt to a picture activity schedule.

Sun 10:40

Using Signs to Encourage Students to Reserve Aisle Seats "...for Those Unfortunates Who Have to Arrive Late".

Louis S. Leland, Jr
Daniel White, Zhe Xin Ang, Chew Wuei Chong, Peggy Pei-Chi Chao, Karen Walsh  The University of Otago

In lecture theatres latecomers searching for a vacant seat create disturbances. We tested a method of alleviating the problem using signs that requested students to reserve every other aisle seat “...for those unfortunates who have to arrive late”. The experimenters compared the number of empty (alternate) marked aisle seats (the marked end seat and the adjacent two seats) of corresponding lecture theaters: One with signs (experimental) and one without signs (control). The number of empty seats in the experimental room was significantly higher than the corresponding seats in the control classes, and that this was only true for rows with signs. The number of empty seats for rows with signs was also significantly greater than in rows without signs.

Sun 11:00

Token Economy in a Substance Abuse Programme for Teens

Sarah Taylor
Oliver Mudford  The University of Auckland
Odyssey House

Minimal positive reinforcement was introduced at a residential facility for adolescents with substance abuse problems. This was met with approval by staff and residents and led to the introduction of a token economy named “Thumbs up”. The Thumbs Up programme has rewarded participants for behaviours such as positive verbal statements, cleaning rooms up to standard, leadership responsibilities and adhering to aspects of the treatment programme. A multiple baseline across settings, behaviours, and participants was used. The programme is individualised in the sense that participants have input in the behaviour they want to change and the back-up rewards they will work for. Results gained so far and future directions will be discussed.
Observer agreement and accuracy with computer-recorded behavioural data

Oliver Mudford
Sarah Taylor
Neil T. Martin
The University of Auckland (OCM & ST)
Treehouse Trust, London (NTM).

Direct observational recordings of behaviour may be facilitated by providing observers with portable computers programmed to record observations. In many settings, this method has replaced the traditional paper-and-pencil recordings using time-sampling and interval recording. There is a paucity of research on methodological issues with computer-recorded data, i.e., interobserver agreement, observer accuracy, and observer training. The results of our preliminary studies in these areas will be presented. The observational materials were video recordings from analogue functional analyses with adults with mental retardation and children with developmental disabilities. Recommendations for practice and further research will be made.

Super-Nanny versus the ODD Kid: Old fashioned parenting becomes state-of-the-art behaviour therapy.

Richard Etheredge
Group Special Education

This seminar reviews what Oppositional Defiant Disorder and Conduct Disorder are; and what current best-practice in their treatment looks like. Treatment often involves “Parent-Training”: This explains why employing a nanny might be an effective treatment for a disorder listed in the DSM. Unfortunately, service provision is not that simple. Examples of New Zealand practice will be discussed and compared to suggestions from the literature on best practice.

Practice Makes the Difference: The Effect of Rate-building and Rate-controlled Practice on Retention

Susan McGregor
Mary Foster
The University of Waikato

Seven participants practiced to accuracy two decks of five previously unknown multiplication facts, yoked for practice and reinforcement. Overpractice was then undertaken using custom built computer software that allowed free-operant rate-building practice, to an established fluency performance standard, on one deck and an equivalent number of rate-controlled practices on the other. 4- and 8-week retention assessments showed no consistent differences in accuracy or response rate between the rate-controlled and rate-built decks. These results suggest that practice to fluency does not lead to superior retention when compared to the same amount of rate-controlled practice. The results also indicate that when a skill is practiced to fluency, a period without practice leads to deterioration, to pre-rate-building levels, of accuracy and response rate. This study highlights the need for research examining the role of maintenance in the effectiveness of fluency based learning like Precision Teaching.
Posters

The Influence of Reinforcer Quality on Self-Control
Heather Peters

This study used a self-control paradigm designed as an analogue of choice situations in which individuals choose between two competing immediately available reinforcers each associated with a different delayed reinforcer. The immediate reinforcers were of equal amount and unequal quality; the delayed reinforcers were of unequal amount and equal quality. An impulsive choice was choosing the alternative that delivered the most-valuable immediate reinforcer and the least-valued delayed reinforcer. A self-controlled choice was choosing the alternative that delivered the least-valuable immediate reinforcer and the most-valuable delayed reinforcer. Increasing the delay between the initial and terminal links increased subjects' responding on the impulsive choice. Behaviour allocation was well described by the CCM when the temporal context scaling parameter was allowed to vary.