New Zealand Association for Behaviour Analysis

6th Annual Conference
August 28-30 2009
The University of Auckland, Auckland New Zealand
WELCOME:
Welcome to Auckland and we hope you enjoy your stay. Included in this booklet is some information about the conference facilities, presentations, and general proceedings.

LOCATION:
The conference will be held at The University of Auckland’s city campus. Sessions will take place on the 7th floor of building Arts I in lecture theatre ARTS 716. Morning and afternoon teas will be in room ARTS 719, which is across the hall from the lecture theatre on the 7th floor of building Arts I. The Arts I building is located a 14a Symonds Street, Auckland City and is building 206 on the map below.

PARKING:
Parking is available in the Owen G. Glenn Building (building 260 on the map below) for $5 (flat rate for the whole day). Access is from Grafton Road, opposite and just below the Faculty of Engineering Building.

OUTLINE OF PROCEEDINGS:
Friday 28 August  7-9pm  Registration, Meet-and-Greet, Poster session (Arts I Room 719)

Saturday 29 August  9:00-10:25  Drugs, Debt, Gambling and Economics
10:25-10:55  MORNING TEA
10:55-12:25  Theory and research in EAB
12:25-1:30  LUNCH
1:30-2:50  Applications with humans and non-humans
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<td>2:50-3:15</td>
<td>AFTERNOON TEA</td>
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<td>3:15-5:05</td>
<td>Crows, hens pigeons and possums</td>
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<td>7 pm</td>
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**Sunday 30 August**

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**COST OF THE CONFERENCE:**
Conference is free for students and $130 for the waged. Any monies remaining will subsidise student presenters crossing the ditch.

**MEALS**
Morning and afternoon tea will be provided on Saturday. Morning tea and lunch will be provided on Sunday (all in ARTS I, Room 719). Lunch will not be provided on Saturday; however Auckland University is in central Auckland where there are a number of lunch options. Additionally, as the University’s Courses and Careers day is also on Saturday, the on-campus cafes are likely to be open.

**CONFERENCE DINNER:**
The conference dinner will be held at Sawadee Thai Restaurant, 42a Ponsonby road (see map). This restaurant is approximately a 10 minute drive or 30 minute walk from the conference location. The link bus ([http://www.linkbus.co.nz/tickets-and-timetables/route-information.php](http://www.linkbus.co.nz/tickets-and-timetables/route-information.php)) has stops both by Auckland University and along Ponsonby road and runs about every 15 minutes. If you will be joining us for dinner, please be at the restaurant between 7 and 7.30.
We have organised a banquet dinner (vegetarian options included, please see below) and ask that you pay your $35 in cash on either Friday evening or Saturday morning. Those with special dietary requirements will be able to select from the standard menu. For more information please see www.sawadee.co.nz. The restaurant is BYO wine and is fully licensed. Although there will be no additional cost for corkage, drinks purchased during the dinner will have to be paid for separately. **Please contact Nathalie Boutros (n.boutros@auckland.ac.nz) by Friday August 21st to confirm whether you will be attending dinner.**

### Banquet Menu

**First course:**
- Satay chicken
- Gari Puff
- Spring Rolls (v)
- Money Bags

**Main Course:**
- Gai Sam Ros: Stir fried chicken with sweet chilli paste and cashew nuts
- Panang Neau Curry: Stir fried beef in think panang curry
- Vegetarian Green Curry: Tofu and vegetables in a coconut based green curry (v)
- Goong Pad Phed: Prawns stir fried with curry sauce
- Pad Pug Satay: Stir fired vegetables with satay sauce (v)

**Dessert and Coffee:**
- Tropical ice cream
- Coffee
- Tea
ABSTRACTS

FRIDAY 28 August 7-9pm: Poster Session

The Effects of Prompts in an Assessment of Language Function in Children with Autism
A. Waterhouse & A. Arnold Saritepe
The University of Auckland

Skinner’s classes of verbal operants and their unique controlling variables provide the necessary framework for a functional analysis of verbal behaviour. Previous research by Lerman, Parten, Addison, Vorndran, Volkert and Kodak (2005) successfully employed techniques derived from functional analyses to develop an assessment for identifying the elementary functions (mand, tact, intraverbal, and echoic) of emerging language in children with developmental disabilities. The purpose of this study was to compare the effects of eliminating prompts and increasing prompts during functional assessment. Participants were four children, between the ages of five and seven, with autism spectrum disorder. The participants did not have functional communication skills but they frequently emitted at least one distinguishable vocal response. The function of their vocal responses was tested in an experimental analysis which included tests with varying amounts of prompts. Results indicated that at least one function was identified for each participant’s target response. Additionally, the results showed that for three participants an increase in prompts led to an increase in their use of at least one verbal operant. Two participants increased their use of mands and one participant increased her use of mands and tacts.

The effect of caffeine abstinence on monetary and caffeine delay discounting.
Allison Kingston, Lewis Bizo, & Stephen Provost
Southern Cross University and University of Waikato

Delay discounting refers to an individual’s preference for smaller immediate reinforcement rather than larger delayed reinforcement, and has been shown to be influenced by deprivation state in drug users. The effect of caffeine withdrawal has not yet been examined in a delay discounting procedure, however, despite its status as the most widely used stimulant drug. Caffeine consumers (n = 24) completed a monetary and a caffeine delay discounting task following normal caffeine consumption on one occasion, and following 12h caffeine abstinence on another occasion, counterbalanced across participants. In line with the results of such studies relating to other drugs, delayed monetary and caffeine rewards were discounted at a significantly higher rate when participants had abstained from caffeine consumption. The implications of this result for an understanding of impulsive behaviour and drug-taking, as well as its ramifications for decision-making behaviour in the real world, will be discussed.

Analysis of choice in concurrent chains with added fixed delays and constant terminal-link duration.
Rebecca Sharp, Doug Elliffe & Michael Davison
The University of Auckland

A concurrent-chains procedure was arranged in which a delay of either 0.5 s or 16 s was added between the links and 15.5 s was added to either link. The results were analysed through the qualitative predictions of models of concurrent-chains performance. Delay reduction theory (Fantino, 1969), the contextual choice model (Grace, 1994), the hyperbolic value-added model (Mazur, 2000) and incentive theory (Killeen, 1982) similarly predicted changes in initial-link sensitivity to terminal-link reinforcement, despite
differential underlying assumptions. Each model was able to account for some of the data, however all were unable to account for the average sensitivity values obtained when additional time was added to the initial links, suggesting that the experimental design effectively separated delay from reinforcement rate but that preference was affected in a way not demonstrated in typical concurrent-chains procedures. Terminal-link sensitivity to terminal-link reinforcement was also analysed under a multiple schedules paradigm, providing support for the extraneous reinforcer reallocation hypothesis (McLean & White, 1983).

Preference: During Extinction?
Michelle Banicevich, Michael Davison, & Douglas Elliffe
The University of Auckland

Preference pulses are short-term and often extreme changes in choice following reinforcement, often towards the just-reinforced alternative in a two-alternative choice procedure. While initially interpreted as a local effect of the last reinforcer location, recent research reported pulses towards the not-just-reinforced alternative when a signalled extinction period was introduced. Inserting an extinction period changes preference. When responding is recorded during the extinction period will we still see a preference pulse following reinforcement or will preference be shown without a pulse? Will preference reflect the just-reinforced alternative or the richer alternative, as responding after extinction does?

Teaching Conditional Discriminations: A Comparison of two methods
Susan Petrie & Angela Arnold Saritepe
The University of Auckland

The current study evaluated the effectiveness of stimulus shaping technology versus an identity matching task in an alternating treatments design. Two studies were run. Study 1 taught three young participants with developmental disabilities to discriminate letters of the alphabet assigned to three different conditions: stimulus shaping, identity matching task, and a control condition with no differential outcomes. Once accuracies reached criterion in a condition, that condition was stopped; students remained in the other conditions until they had either reached criterion or their responding remained below 50%. The rate of acquisition and number of errors were measured. The results showed that stimulus shaping was a faster method of teaching complex discriminations that resulted in fewer errors than the identity matching task. Study 2 trained three older students with developmental disabilities to discriminate sight words, using the same three experimental conditions as Study 1. Stimulus shaping was more effective at teaching conditional discriminations than an identity matching task for two out of three participants. Implications for applied use and future research are discussed.

Do New Caledonian crows understand the properties of their tools?
J.C. Holzhaider, G.R. Hunt, & R.D.Gray
The University of Auckland
V.M. Campbell
Cornell University, Ithaka, NY

Here we investigate if New Caledonian crows understand the functional properties of the tools that they routinely use in the wild. Pandanus tools have natural barbs along one edge that enable crows to hook up prey from crevices. We presented eight crows with either a non-functional (‘barbs-down’) or a functional (“barbs-up”) pandanus tool in a baited hole. Crows appeared to flip a tool when it was not working. When presented with a choice of either a barbed or a barbless pandanus tool, crows chose tools at random. Crows do not appear to consistently attend to the presence or orientation of barbs on pandanus tools. Successful pandanus tool use in the wild seems to rely on behavioural strategies formed through associative learning,
Identifying a suitable controller type for human operant experiments  
Alvin E. Zapanta, Jason Landon, Christian U. Krägeloh, & Daniel Shepherd  
Auckland University of Technology

Values of sensitivity to reinforcement in humans are still observed to be more variable than those found using nonhuman subjects. Procedures using similar species of animals tend to use similar types of apparatus for behavioural observations. In human studies, these have differed substantially between investigations possibly becoming one factor for the observed variability of sensitivity values. In the present study five manipulanda (joystick, gamepad, touchpad, computer mouse and touch-pointer) were tested in a track-and-click computer task, and the response thresholds compared. Comparisons were made through linear regression and repeated measures analysis of variance. The computer mouse was found to be the manipulandum with a response threshold that is most suitable for a human operant choice task of a track and click apparatus.

Using group contingencies to increase vocational on-task behaviour in individuals with intellectual disabilities.  
Svetalana Iljinova, Katrina Phillips, & Oliver Mudford  
The University of Auckland

Group contingencies have been successfully used in educational setting to decrease disruptive behaviours and increase appropriate social and academic behaviours. There is limited research that has been applied to groups with intellectual disabilities (ID) and used in the adult population. The present study looked at using group contingencies to increase vocational on-task behaviour in adults with intellectual disabilities. Interdependent group contingency with individualised reinforcement was used to target on-task behaviour. Momentary Time Sampling (MTS-15s) was used to observe the behaviours of the individuals within the group. The results demonstrated that the on-task behaviour increased above 80% criterion following the implementation of interdependent group contingency.

Variability of behaviour in extinction.  
Leanne Neshausen & James McEwan  
University of Waikato

Hens were trained to peck a square stimulus on a touch-sensitive screen under an FR5 reinforcement schedule for a maximum of 30 reinforcers (taking approximately 10 minutes). Then hens experienced extinction sessions of 40 minutes duration. For a total of six conditions, reinforcement and extinction conditions were alternated. Each condition consisted of between approximately 7 and 10 sessions. Results show that structures or patterns developed during conditioning remain in extinction, at least for the duration of previous reinforcement sessions. After approximately 10 minutes, behaviour becomes more variable. Extended extinction conditions, and alternating extinction conditions with reinforcement conditions had little effect on the variability of behaviour, but did influence the rate of responding. Responding persisted a little longer before gradually declining across sessions in the first extinction condition. In extinction conditions 2 and 3 responding tended to occur more as ‘peaks’; short periods of increased responding with periods of non-responding between peaks.
SATURDAY 29 August

9:00-10:25 am  Drugs, debt, and gambling and Economics
CHAIR: Douglas Elliffe

Effects of Punishment on Choice in a Concurrent Schedule Gambling Task (20mins)
Celia Lie & Brent Alsop
University of Otago, Dunedin

Research on concurrent-schedule choice has focused almost exclusively on the effects of rewards. In contrast, few studies have investigated the effects of punishment on choice behaviour. Recently, we have studied the effects of punishers on human choice behaviour using concurrent schedules embedded in a gambling-type task. In this procedure, participants were presented with two simulated slot machines on a computer. Here, we will present some preliminary data from experiments which varied the relative frequency or magnitude of real punishers (point losses) or the relative frequency of conditioned punishers (“near misses”). Overall, the concurrent schedule gambling task shows potential for studying factors that affect human choice behaviour.

TBA (15 minutes)
Heather Peters
Open Polytechnic

Behavioural Economic Analysis of the Oral Self-Administration of MDMA (‘Ecstasy’) in Rats (20mins)
Lincoln S. Hely, David N. Harper, Maree Hunt & Susan Schenk
Victoria University of Wellington

The so-called “party drug” 3,4-Methylenedioxymethamphetamine (MDMA, or ecstasy) may share many of the addictive properties common to other CNS stimulants. Experimental evidence for the reinforcing properties of MDMA can be derived from manipulations of the self-administration procedure. Reinforcing efficacy can be studied by utilising a behavioural economic framework and examining changes in consumption (reinforcers consumed) as function of changes in the price (response requirement). This study sought to characterise rats’ response to oral reinforcement using MDMA and to measure MDMA’s reinforcing efficacy when delivered orally. An economic analysis was conducted by manipulating the Fixed Ratio (Price) requirement across sessions and doses (0.2, 0.4, 0.8mg/kg and vehicle). Demand curves were analysed and indicated increased demand (higher P-max) for MDMA-containing solutions than for vehicle alone. The results of these studies provide evidence for the positive reinforcing effects of MDMA when it is delivered via the oral route of administration.

Credit card logos and perceived value (15 minutes)
Maree Hunt et al
Victoria University of Wellington

Feinberg (1986) found that in the presence of a credit card logo items were given higher monetary values than they were given in the absence of the logo. Feinberg speculated that associative learning was the mechanism underlying this effect however alternative explanations that may be related to delay discounting have also been offered in the literature. Should the associative learning explanation be valid, then changes in the broader social and/or economic context may alter this effect. That is, if credit cards are more associated with negative aspects of debt rather than access to goods, then credit card logos may be
spending inhibiting rather than spending facilitating, stimuli. In New Zealand media campaigns have portrayed debt negatively and survey research indicates students do perceive debt as negative. Thus in the New Zealand student population credit card stimuli may limit spending. Study 1 demonstrated that the presence of credit card stimuli did lead to smaller perceived values of consumer items in Year 1 New Zealand university students. Study 2 replicated this effect with Year 4 university students. The demonstration of this “negative” credit card effect in this context supports the possibility that the “positive” credit card effect (or absence thereof) in previous studies may rely on associative learning.

A comparison of three methods of normalizing demand for different foods. (15mins)

Mary Foster & William Temple
University of Waikato

Concurrent schedules showed hens preferred wheat over puffed wheat. Hens’ response rates under fixed-ratio schedules were found to be faster at smaller ratios for puffed wheat than for wheat. Both curvilinear and sigmoidal demand functions described the relation between log consumption and log price for both foods well. Wheat resulted in lower initial consumption and the ratios at which the demand functions predicted maximal responding were larger for wheat than for puffed wheat. Normalizing demand both as suggested by Hursh and Winger (1987) and as suggested by Hursh and Silberberg (2008) moved the data from the two foods towards single demand functions. Both manipulations resulted in puffed wheat giving the more inelastic demand and maintaining behavior to higher prices. Normalizing demand by converting the puffed wheat reinforcers to wheat equivalents (based on concurrent-schedule biases) gave separated demand functions for the foods. Wheat had highest initial consumption, the most inelastic demand and maintained behavior to higher prices. Normalizing demand in this way appears to have some advantages.

10:25-10:55 MORNING TEA

10:55-12:25 Theory and research in EAB
CHAIR: Celia Lie

More on resistance to change in concurrent schedules (15 mins)

Anthony McLean
University of Canterbury

Does screen flicker rate affect hens’ discrimination of visual stimuli? (15 mins)

Renée Railton, T Mary Foster & Bill Temple
University of Waikato

The use of television and computer screens for presenting stimuli to animals is increasing as it is non-invasive and can provide precise control over stimuli. Past studies have used cathode ray tube (CRT) screens; however, there is some evidence that these give different results to non-flickering thin film transistor (TFT) screens. Hens’ critical flicker fusion frequency ranges between 80-90Hz - above standard CRT screens. Thus, stimuli presented on CRT screens may appear distorted to hens. This study aimed to investigate whether changing the flicker rate of CRT screens altered hens’ discrimination. Hens were trained (conditional discrimination) to discriminate between two stimuli on a TFT (flicker-less) screen, and tested with the stimuli on a CRT screen at four flicker rates (60, 75, 85, and 100Hz). The hens’ accuracy decreased monotonically as the refresh rate of the CRT screen decreased. These results imply that the change in flicker rate changed the appearance of the stimuli enough to affect the hens’ discrimination and stimulus control breaks down when stimuli appear flickering.

The characterization of conditional reinforcers (20 mins)
Consensus over how to characterize and understand conditional reinforcers has been elusive. Although some advocate a conditioned value account wherein the stimulus is said to acquire hedonic or appetitive properties, evidence from a number of laboratories (include my own) and using a variety of methods suggests otherwise. I will briefly review some of the major results which I think demonstrate that conditional reinforcers do not in fact increase response strength. Instead, I suggest that conditional reinforcers act as signals of forthcoming food. They can signal either the time of the next food and/or the responses required for those foods. These ideas are similar to theories of conditional reinforcement developed to account for behaviour in the concurrent chains procedure (e.g. DRT) and the informal verbal accounts used to describe behaviour in second-order and percent reinforcement procedures (e.g. Neuringer & Chung, 1967). The characterization that I advance differs from these earlier accounts however in that the stimuli are not said to have any acquired value. How conditional reinforcers are characterized is of not only theoretical interest, but may also affect their use in applied settings.

Performance of Human and Pigeons in Analogous Numerical Discrimination Tasks (20mins)
Lavinia Tan
University of Canterbury

We investigated the performance of humans in a verbal and nonverbal numerical discrimination task, and examined similarities and differences between humans and nonhumans. Each trial in this procedure began with a sample phase, in which a sequence of randomly ordered green and red pictures of common objects was presented. Subjects were required to monitor the number of red pictures presented during the sample phase, and report the number in a following response phase, using one of three response types: 1) Reproduction in key-presses, 2) Categorization as "large" or "small" or 3) Report. Participants were randomly assigned to two groups, either a verbal counting group- in which participants were required to say out loud, as each picture was presented, the number of red pictures already seen- or a non-verbal counting group- in which participants were prevented from counting verbally by being required to name each object presented. The nature of responding in this task will be discussed and compared with findings from previous experiments with nonhuman animals.

A model for selective stimulus control (20mins)
Michael Davison & Douglas Elliffe
The University of Auckland

Four pigeons were trained in a conditional discrimination procedure in which the conditional stimulus was a compound comprising two stimuli from two dimensions. Choice contingencies were different depending on the elements of the compound. The relative frequency of reinforcers for correct choices with respect to the two dimensions was varied across conditions. Discriminability ($\log d$) increased as the relative frequency of reinforcers for correct choices on one of the stimulus dimensions increased. $\log d$ in additional conditions in which only one of the two stimulus dimensions was differential was not different from compound-stimulus conditions, and discriminability was not enhanced in a redundant-relevant cues condition in which each of the elements of a compound signaled the same choice contingencies. The data were well described by the reinforcement-for-errors model reviewed by Davison and Nevin (1999).

12:25-1:30 BREAK FOR LUNCH

1:30-2:55 Applications with humans and non-humans
Services for teens with conduct problems: What the “beep” does ABA know? (15mins)
Sarah Taylor
Youth Horizons

Providing services for teenagers with conduct problems (e.g. substance abuse, offending, disruptive behaviours) is becoming an increasing area of interest in New Zealand. While ABA has proven its effectiveness with other populations, work in this area is relatively new and current services are generally run under semi- or non-behavioural models. Guidelines for introducing ABA into these types of services will be discussed with examples of past and current research from residential and day treatment settings.

Reducing Saliva Play Using DRI and Response Block (15mins)
Jing Zhu & Oliver Mudford
The University of Auckland

The present programme was an effort to help the participant reduce saliva play behaviour by increasing the engagement in toy play. The training method was differential reinforcement of incompatible behaviour plus response interruption. During the training, the participant was prompted to engage in toy play which led to the access to the reinforcers. If the saliva play occurred, the behaviour was interrupted by blocking any hand movement towards the mouth. The results showed that the participant engaged in toy play most of the time, and the saliva play behaviour decreased to a zero level during the training. This performance was generalized across settings and people. The observation in natural environment showed that the saliva play behaviour had decreased in comparison to its pre-training level. However, the occurrence of the behaviour in natural settings was still at an unacceptable level. More training was required.

Training caregivers to use continuous recording (15min)
Katrina Phillips
The University of Auckland

The collection and analysis of data is a cornerstone of ABA, however, it is not always practical for a practitioner to be present when behaviours are occurring. One way to overcome this is to train staff to be reliably data collectors. While the literature is full with examples of lay individuals taking data there is limited research on the training process that is required to achieve reliable recorders. This research trained two staff to record the behaviours of two residents in the house in which they worked. Data was recorded on an HP ipac and then analysed for agreement against the author. Results and limitations will be discussed.

Development of a self directed learning programme on how to implement positive reinforcement with horses (20mins)
Kate Southcombe
The Open Polytechnic of New Zealand and Equine Positive Reinforcement Training
Heather Peters
The Open Polytechnic of New Zealand

The popularity of trainers like Pat Parelli and Australia’s behaviourist Dr Andrew McLean suggest there is interest in learning more about training and theory, however access to professional trainers is limited. Two studies carried out in Australia and New Zealand, highlight two key findings: i) there is a lack of understanding of how operant training techniques can be used with horses; and, ii) a large number of horses
fail to reach potential (wastage). While neither study demonstrates that there is a direct correlation between these findings, these results suggest that there is room for improvement in both areas. Our goal is to develop a training system that is cost effective, reliable and educationally structured on sound learning principles that allows the student to take charge of their learning, which in turn may impact on both the trainer’s learning experience and the potential for the horse. This presentation will discuss the initial development of a training model for future investigation.

**Do empirical stress models also reflect psychological responses to challenges? (20mins)**

Lindsay Matthews, Adele Arnold & Jeremy Bryant
Agresearch

Assessment of animal welfare requires that both the physiological and psychological requirements of animals are satisfied. For thermal challenges, empirical models are often used to predict the risks to physiological homeostasis. Such models include the temperaturehumidity index (THI) and black globe temperature-based heat load index (HLI) which calculate a predictive index of heat stress based on climate variables of air temperature, wind speed, relative humidity and solar radiation. The cold stress index (CSI) is a similar predictive index of cold stress based on air temperature, rainfall and wind speed. It was hypothesised that similar models may be useful for quantifying the risks to the psychological wellbeing of animals under thermal challenges. A series of experiments to test this hypothesis with dairy cattle exposed to cold or heat challenges was undertaken and the results will be presented.

2:55-3:20 AFTERNOON TEA

**3:20-5:05 Crows, hens, pigeons and possums**

CHAIR: Mary Foster

**Separating the effects of time and effort in fixed ratio schedules (15mins)**

Aimee Harris, Bill Temple & Mary Foster
Waikato University

The assessment of animals’ demand typically involves the use of increasing fixed ratio (FR) schedules of reinforcement, which are thought to be analogous to price in consumer demand theory. One confound with using FR schedules is that as the ‘price’ or FR increases, so too does the time it takes to complete the response requirement. For example, to complete an FR 20 schedule would take approximately twice the time it would take to complete an FR 10 schedule. The aim of the present experiment was to determine whether it is the time or the response requirement that has more influence on behaviour. A conjunctive schedule of reinforcement was used, combining various FR and fixed interval (FI) schedules of reinforcement, enabling both the time and the response requirement to be manipulated separately. The results to date suggest that the time it takes to complete the response requirement has more effect than the number of responses required.

**Molecular temporal relationship between response and reinforcement on VR and VI schedules (15 mins)**

Takayuki Sakagami
University of Canterbury
Takayuki Tanno
Keio University

Four rats were exposed to a VR 30 and a yoked VI schedule. Responses during each interreinforcement interval (IRI) were individually extracted from obtained time series data, and a response rate at the
molecular level was calculated by dividing the number of responses during the IRI by each IRI. We confirmed a different relationship between reinforcement rates and response rates on VR and VI schedules at the molecular level. The correlation between response and reinforcer rates was weakly positive or zero in the VR schedule, but was moderately negative in the VI schedule. Other temporal relationships at the molecular level were discussed.

A comparison of measuring domestic hens’ sound preferences using concurrent schedules. (15mins)
Amy Jones, Bill Temple & Mary Foster
University of Waikato

Six domestic 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 hens then responded under concurrent-chain variable-interval schedules of reinforcement with the same sounds associated with one of the two fixed-interval terminal links. The effects of the various sounds on the hens’ performances under the two procedures and the measures of bias resulting from the presence of the various sounds will be presented.

MTS in possums: How far is too far? (20 mins)
Kristie Cameron
University of Waikato

Brushtail possums, Trichosurus vulpecula, were presented with blue and yellow stimuli. Simultaneous Matching to Sample (MTS) and MTS with 0s delay was carried out with stimuli immediately above the response levers. MTS with 0s delay was carried out with stimuli at levels 1 to 5 (5, 25, 45, 65 and 85mm) above the levers. Possums showed peak performance at the currently trained level and showed a decrease in performance for levels further from the trained level. There was a generalization effect shown in most possums in that performance increased at levels surrounding the trained level. The effect of separation between stimuli and response manipulanda demonstrates a parallel between the effect of distance and delay on behaviour. As distance between events is increased performance is less likely to be accurate. There are parallels between these findings and Delayed Matching to Sample (DMTS) data. As training delay was increased, performance at previous delays generalized to a flat gradient (Sargisson & White, 2001). However, performance was not generalized to the same degree when distance of stimuli from response manipulanda was increased. This suggests that the similarities between distance and time are warranted, but limited, and the phenomenon requires further elaboration.

Development of pandanus-tool manufacture and use in wild New Caledonian crows
(Corvus moneduloides) (20mins)
J.C. Holzhaider, G.R. Hunt, & R.D.Gray
The University of Auckland

New Caledonian crows are renowned for their tool manufacture and tool use abilities, but the development leading to their extraordinary performance is still unclear. Here I document the development of wide pandanus tool manufacture and use of wild NC crows from about 3 months post hatching to the age of up to 1.5 years. The development of tool oriented behaviours in the wild appears to be a very extended process which may last a year or even longer. Although individual trial and error learning, including long periods of unrewarded attempts to extract food with unsuitable tools, appear to play a major role, the young crows also have ample opportunity to socially learn about tool use and manufacture through different channels.
New Caledonian crows and the trap tube problem

Alex Taylor, et al
The University of Auckland

The extent to which animals other than humans can reason about physical problems is contentious. The benchmark test for this ability has been the trap-tube task. We presented New Caledonian crows with a series of two-trap versions of this problem. Three out of six crows solved the initial trap-tube. These crows continued to avoid the trap when the arbitrary features that had previously been associated with successful performances were removed. However, they did not avoid the trap when a hole and a functional trap were in the tube. In contrast to a recent primate study, the three crows then solved a causally equivalent but visually distinct problem—the trap-table task. Our findings suggest that New Caledonian crows can solve complex physical problems by reasoning causally about causal relations. Causal reasoning may form the basis of the New Caledonian crow’s exceptional tool skills.
Sunday 30 August

9:00-10:10  Choice and Equivalence
CHAIR: Michael Davison

Local preference is controlled by the next-reinforcer location (15mins)
Sarah Cowie, Denys Brand, Michael Davison & Douglas Elliffe
The University of Auckland
Jason Landon
Auckland University of Technology

Do changes in choice (preference pulses) on concurrent schedules following reinforcers reflect "reinforcement"? Recent research suggest that reinforcers may signal a future behavior-reinforcer contingency, rather than increasing the probability of the behavior that produced the last reinforcer. In the present experiment, overall concurrent VI reinforcers were kept equal on 2 alternatives, and the probability that the next reinforcer would be obtained sooner on the just-productive alternative, or sooner on the not-just-productive alternative, or sooner on a specific alternative was varied. Preference pulses were jointly controlled by the likely time and location of the next reinforcer as signaled by the just-obtained reinforcer, and not by the location of the just-produced reinforcer

Indirect cues in a rapidly changing, three-alternative environment (15mins)
Joshua Bensemann, Doug Elliffe & Michael Davison
The University of Auckland

In rapidly changing procedures subjects have no knowledge of the current reinforcement contingencies after a contingency change. A subject can only reach optimal performance by following the cues that are present after the change. Normally the only cue available to the subject is the location of the last reinforcer. In two-alternative choice procedures this indicates the likely reinforcement ratio between the alternatives. If there are more than two alternatives, a reinforcer from one alternative provides no direct information about reinforcement ratios between the non-reinforced alternatives. In these situations a subject must use additional cues to guide performance. This presentation focuses on two different cues in a three-alternative procedure. One of these is a constant relationship between two of the alternatives, and the other is a relationship between overall reinforcer rate and current reinforcement contingencies. Preliminary results suggest these cues are used to track contingencies closely.

Human choice behaviour in a frequently changing environment. (20mins)
Alvin E. Zapanta, Jason Landon, Christian U. Krägeloh, & Daniel Shepherd
Auckland University of Technology

Six participants played a computer game application where choice involved popping balloons from two adjacent panels. Fifteen sessions were arranged, which each arranged seven reinforcer ratios (27:1 9:1, 3:1, 1:1, 1:3, 1:9 and 1:27) randomly without replacement. Components were separated by a 10-s intercomponent interval, and a 2-s COD was in effect. Reinforcers were arranged independently at an overall rate of 6.00 reinforcers per minute. Sensitivity to reinforcement was observed between -0.01 to 0.98, more variable than sensitivity seen in nonhuman studies using a similar procedure. Local effects of reinforcement were also apparent: Two participants showed strong preference to the just-reinforced alternative with pulses lasting around 30 responses. Other participants also showed preferences to the just-reinforced alternative, although the size of preference pulses appeared to be correlated with sensitivity to reinforcement. While the present procedure did observe variable sensitivity values in comparison to studies.
involving nonhumans, at all levels of analysis the results generally paralleled those seen in nonhuman studies.

The effect of the number of training trials and stimulus arrangement (Linear, many-to-one, one-to-many) on the facilitation of derived equivalence relations in operant and associative procedures. (20mins)

Jennifer Kinloch, Mary Foster, & James McEwan
University of Waikato

A series of experiments, based on a study by Leader & Barnes-Holmes (2001), were conducted to assess the comparative effectiveness of matching-to-sample and paired stimulus procedures in facilitating the formation of derived equivalence relations. These studies looked at the differing effects of stimulus sets, instructions, number of training trials, and stimulus arrangement across the two procedures. Of these, two factors (number of training trials and stimulus arrangement) were shown to affect the outcome of these training methods. In particular, a greater number of training trials prior to the testing condition, but not number of trials overall, appeared to increase the likelihood of equivalence formation, suggesting an effect of blocking trials in large numbers. Additionally, the arrangement of stimuli in the training trials (linear, many-to-one, and one-to-many) had differing effects, with the linear procedure less likely to result in equivalence relations than either many-to-one or one-to-many. The results of these two studies will be discussed.

10:10-10:30 MORNING TEA

10:30-11:35 Applications with Children and Adolescents
CHAIR: Katrina Phillips

Successful planning of Generalisation with children in a school setting (15mins)
Kelly Ann De Rozario & Oliver Mudford
The University of Auckland

Generalisation is an important part of any behavioural intervention. Often however practitioners fail to program or plan for generalisation and then are faced with the difficulty of the target behaviour not transferring across settings, people, and time. One part of this study investigated the effectiveness of Functional Communication Training to reduce inappropriate verbalisations in a female student. FCT was conducted in one academic subject (training setting) and involved prompting the participant to say ‘Excuse me’ each time an inappropriate verbalisation was vocalised. Data was also collected in four additional academic subjects (generalisation settings) where no FCT was available; however various strategies of generalisation such as mediate generalisation were programmed. Results showed a marked decrease in inappropriate verbalisations with generalisation occurring across all four untrained settings. These results provide further evidence that generalisation of treatment can be achieved when carefully planned and programmed for.

Modified Incidental Teaching with Lag Schedules of Reinforcement to Increase Variable Manding in a Child with Expressive Language Deficits (15mins)
Rebecca Sharp & Angela Arnold-Saritepe
The University of Auckland

Modified incidental teaching was combined with lag $x$ schedules in an effort to produce acquisition of framed mands in a child with limited expressive language. The lag $x$ schedules were implemented in an attempt to correct the invariant responding produced in the modified incidental teaching component.
Specifically, the interruption of behaviour chains in settings in which this was able to be conducted was implemented to produce contrived establishing operations, with captured mands used in other settings in a multiple baseline across settings design. Environmental manipulations included preventing access to items necessary to complete the behaviour chain and passively blocking the child's path either through baiting the environment (contrived) or utilising naturally occurring opportunities (captured). A least-to-most prompting hierarchy was used and the desired item provided contingent on a framed mand being emitted. A further modification to the incidental teaching procedure was the addition of a practice trial within each child-initiated teaching opportunity. Upon attaining mastery criterion for emitting mands in the modified incidental teaching component, invariant framed mands were being produced, therefore further modified incidental teaching trials were conducted under varying lag x schedules of reinforcement in an effort to produce varied responding. An increase in varied unprompted mands was attained. Concomitant changes in overall language emitted in the classroom were also observed throughout the study as well as generalization across both settings and people.

Using Precision Teaching for Classroom-Based Teaching of Multiplication Tables
(15mins)
Desiree Horlacher, Eric Messick, & Mary Foster
University of Waikato

PT is a way of monitoring rate of learning and making curriculum decisions for the purposes of attaining fluent behaviour. School students learned multiplication tables in a standard teaching format or in a precision-teaching format whilst at school. Groups’ pre- and post-measures of fluency were compared to determine if the use of PT resulted in better performance than standard teaching (as is reported in the literature). Results suggested that both groups improved similarly according to the fluency measures. Hypotheses will be presented on why there was little difference and recommendations for future similar research will be given.

Self Injurious behaviour and self restraint in an adolescent with developmental disabilities (20 mins)
Angela Arnold-Saritepe
The University of Auckland

Intervention options for a fifteen year old with self injurious behaviour (SIB) and self restraint (SR) were investigated. Historical functional analyses had shown both the SIB and SR functioned as an escape / avoidance from demands. A recent functional assessment suggested both behaviours to result in both positive and negative reinforcement. Decreased demands, enriched environment, and medication have all produced short term reductions in self injurious behaviour. Current rates of behaviour continue to place the client at risk of causing permanent physical harm.

11:35-12:35 Memory and Ageing
CHAIR: Nathalie Boutros

The Causes of Forgetting. (20mins)
Geoff White & Glenn Brown
Otago University

Debate over the last 100 years about the causes of forgetting has focussed on trace decay versus interference. There is mounting evidence against the trace decay notion, and theories of human short-term forgetting have suggested various interference mechanisms such as temporal confusion, output interference, and cue overload. The present paper explores an interference theory based on reinforcer
control. This is an extension of the model proposed by White & Wixted (JEAB, 1999) to include the effects of extraneous reinforcement. By assuming that extraneous reinforcement increases with increasing retention-interval duration, it is possible to predict forgetting functions that vary in slope and intercept. Forgetting is thus simply explained in terms of the relativity of reinforcers for remembering versus other behaviours.

You can’t teach an old rat new tricks (20mins)
Douglas Elliffe, Laura Jacobson, Rong Zhang, Kuan-Fei Chen, Sam Mathai, Dianne McCarthy, Henry Waldvogel & Jian Guan
The University of Auckland

Young (4 months), middle-aged (9 months) and old (18 months) rats took part in several behavioural tasks – the Morris Water Maze, the radial-arm maze, and the T-maze alternation task. Increased age was associated with less accurate performance on all tasks, and we have previously reported both this finding and its relation to age-related neuronal loss (Jacobson et al., 2008). However, we also analysed, but didn’t report, age-related differences in rates of learning. While these differences in rates of learning didn’t reach statistical significance on any of the three tasks individually, taken together they offer converging evidence that aging is associated with slower and/or less learning.

Equivalence class formation and verbal competence in older individuals (20mins)
Steve Provost & Natasha Wolfe
Southern Cross University

One of the reasons for suggesting a connection between equivalence class formation and verbal behavior is the paucity of evidence for successful stimulus equivalence training in non-verbal humans or animals. Thirty one older individuals performed the Mini Mental State, Verbal Fluency, Divergent Naming, Convergent Naming, Boston Naming, and a Brief Vocabulary Test before completing a 3-class stimulus equivalence procedure. The B-A symmetry and A-C transitivity tests correlated significantly with fluency, but not with any other verbal tests. The B-C symmetry test correlated less well with fluency, but also correlated with the Convergent Naming Task. The C-A stimulus equivalence task did not correlate with any verbal test. These data support the general notion of a relationship between equivalence class formation and aspects of verbal behavior. They also suggest that considerable caution needs to be taken when interpreting the results of studies utilising the omnibus C-A stimulus equivalence test.

12:35-2:00  CATERED LUNCH + AGM

2:00-2:40  ABA and universities
CHAIR:  Angela Arnold-Saritepe

Improving Asthma Self Management in Tertiary Students (20mins)
Marthinus Bekker & Louis S. Leland, Jr.
University of Otago

New Zealand is rated the 7th highest country in the world for the prevalence of asthma, with an estimated 15.1% of the population suffering from this disorder. Contributing to the severity of the problem is the poor management of the condition despite the availability of adequate treatments. Patient compliance with asthma medication regimes is well known to be poor; the tertiary student population is a particularly noncompliant group with self-reported adherence being as low as 44%. The current study has three main aims, the first is to test a method of increasing asthma medication adherence, the second is to improve the technique which participants employ when using their inhalers, and the third is to make participants aware
of the positive outcomes associated with reaching the other aims and provide them with general education. We are approaching these aims using proximal pairing, feedback, and education. Preliminary results will be presented.

**Utilising Proximal Prompts and Scanners to Reduce Paper Wastage Associated with Photocopying (20mins)**


This study was designed to test a method of reducing photocopier usage, and subsequent paper waste. There were four multiple photocopier areas two of which had single scanners also present. In the two experimental areas we introduced obtrusive, coloured proximal written prompts which promoted the use of scanning to a USB flash drive as an alternative to photocopying. The results showed a significant interaction between the control photocopier areas and experimental photocopiers/scanner areas as recorded during the baseline and intervention periods. There was a decrease in the number of pages photocopied during the intervention phase in the experimental settings, when compared to control settings data. When experimental photocopier usage was adjusted to include the data for scanner use, this interaction was no longer evident, indicating that the decrease in photocopier usage was due to participants scanning instead.

2:40  End of the conference
Thanks for coming
have a safe trip home

"I think we finally mastered foraging theory."

"I can't sign that behavior contract unless my attorney reviews it."

"Just pretend you don't notice him."

"Hey! If you were a boy, would you go to McDonald's again?"

"No, we don't do that. We just throw tantrums."

"I'm about to throw a tantrum. What are you doing?"

"My parents don't punish me anymore. The last time they did, I hid all the remotes."

"We're not from a tantrum family."

"Just pretend you don't notice him."

"Do you have any books on managing disruptive students? I want to know what the opposition is up to."

"There's a problem... this one seems to prefer the shocks..."

"Bells, rings, I get a treat... bells, rings, I get a treat... it went on for the rest of the day..."

"The dark truth about Remy's dog."

"Will press lever for food."

"Don't blame me. It's Saturday."