15th Annual Conference
1-2 September, 2018
The University of Auckland

CONFERENCE PROGRAMME
WELCOME TO AUCKLAND!

Welcome to the University of Auckland for the 15th annual conference of the New Zealand Association for Behaviour Analysis (nzaba.org). We hope you enjoy the conference and your time in Auckland.

FRIDAY NIGHT SOCIAL + DRINKS

If you arrive in Auckland on Friday, please come and meet other conference attendees at Omni Bar at the Pullman Hotel (Corner Princes Street and Waterloo Quadrant, Auckland 1010; http://www.pullmanauckland.co.nz/restaurant-main-page/omni-bar/). Food and drink for purchase at the venue. We will be there from 6 pm.

CONFERENCE VENUE

The conference will be held in the Medium Chemistry lecture theatre (301-G053), in the Faculty of Science building (Building 301, 23 Symonds Street, Auckland 1010). A map of the university campus is available here: https://cdn.auckland.ac.nz/assets/auckland/on-campus/our-campuses/campus-maps/city-campus-map.pdf

PARKING

Conference attendees can park in the Owen G Glenn Building (OGGB) car park, accessible via Grafton Road. The car park is open from 7 am to 11 pm daily, and is accessible after hours via the pedestrian door. Weekend parking costs $6 per day. See https://www.auckland.ac.nz/en/on-campus/our-campuses/parking-information.html for more information about parking near the university campus. Street parking (pay by the hour) is also available around campus.

The conference dinner location is about a 15 min walk from the university campus. We recommend walking from campus, as it can be difficult to find parking around the CBD. If you choose to drive, there are several paid carparks close
to the dinner location (see the map below). See the links below for more information about carparks in the Auckland CBD.

Tournament Parking: https://www.tournament.co.nz/
Wilson Parking: http://www.wilsonparking.co.nz/find-a-park
Secure Parking: https://www.secureparking.co.nz/en-nz

REGISTRATION

Everyone attending or presenting at NZABA needs to register. Registration is $30 if you are unwaged (employed < 30 hours per week) and $150 if you are waged (employed 30+ hours per week). The registration desk will be open from 8:00 each morning outside the conference lecture theatre. You can pay by cash, cheque, or bank transfer. Our bank account name is NZABA and the number is 06-0158-0381026-00. Please include your name in the memo field.

INSTRUCTIONS FOR PRESENTERS

Paper Presentations: Each paper presentation is allocated 15 minutes. Presenters should aim to speak for 10-12 minutes to ensure time for questions. All presenters should upload their talk onto the lectern computer prior to their session.

Poster Presentations: Poster sessions will be held during the breaks between sessions, in the foyer outside the conference lecture theatre.

CATERING

Coffee, morning tea, and lunch will be provided.

CONFERENCE DINNER

The conference dinner will be held at Mexican Café (67 Victoria St W, Auckland, 1010; http://www.mexicancafe.co.nz/). The dinner costs $30 in addition to the conference fee. If you plan to attend, please pre-register and pre-pay at the registration desk or by bank deposit. Our bank account name is NZABA and the number is 06-0158-0381026-00. Please include your name in the memo field.
FRIDAY

6:00   DRINKS + SOCIAL @ OMNI BAR, PULLMAN HOTEL

SATURDAY

8:00   REGISTRATION + COFFEE
8:50   WELCOME

SESSION 1 – Chair: Alejandro Macías

9:00   The effects of semantic, episodic, future and past thinking on delay discounting rate
Rebecca Olsen, Maree Hunt, Anne Macaskill
Victoria University of Wellington
Excessive delay discounting (choosing a smaller sooner reward over a larger delayed reward) is associated with various problem behaviours. One phenomenon shown to reduce delay discounting rate is Episodic Future Thinking (EFT; imagining personal future events). The current study investigated the components of EFT that are necessary to reduce delay discounting rate. Participants chose between a smaller, immediate reward (e.g., $500 now) and a larger reward ($1,000) received after various delays. Before making their decision participants saw cues prompting them to: 1) imagine personal future events (EFT condition), 2) remember personal past events (Episodic Past Thinking condition), and 3) think about items that a person could buy with $1,000 (Semantic Thinking condition). During the ‘no thinking’ control condition, no cues were presented. If thinking about the past has no effect on discounting rate then this would show that thinking about the future is necessary in producing the EFT effect. If semantic thinking has no effect on discounting rate then this would show that episodic thinking is necessary in producing the EFT effect. Preliminary results will be discussed.

9:15   Effects of acute and chronic methamphetamine on choice in delay and probability discounting
Rebecca Ryan (Bodeker), Randolph Grace
University of Canterbury
The relationship between impulsivity and stimulant drugs is complex and previous research has produced contradictory outcomes with some results finding that stimulants decrease impulsive behaviour, while others find that impulsive behaviour is exacerbated. In an attempt to further clarify the relationship between impulsive choice and the use of stimulants both clinically and recreationally, this study employs several behavioural measures of impulsivity in conjunction with acute and chronic methamphetamine exposure. PVG rats (n=12) performed delay discounting and delay magnitude effect tasks while a further group (n=12), performed probability discounting and probability magnitude effect tasks in a rapid acquisition concurrent chains procedure. After baseline training, subjects were split into high and low impulsivity groups, before methamphetamine administration commenced. Three increasing doses of methamphetamine were delivered acutely before a chronic dose was administered over several days. A baseline was then re-established at the conclusion of the study. Generalized matching analysis validates the experimental design in that subjects produced delay discounting, probability discounting and magnitude effects. Dose dependent effect size and response rate change as well as results of the impulsivity splits and potential applications are also discussed.
9:30  **The effect of should versus would decisions and question order on delay discounting of reinforcers for self and others**  
Mary Beth Neff, Anne Macaskill, Maree Hunt  
*Victoria University of Wellington*  
When given the choice, we often choose smaller and more immediate rewards over larger, delayed rewards. The fact that rewards lose value over time is referred to as delay discounting. Recent research has investigated how we weigh these smaller sooner and larger later reward alternatives in decisions we make for other people. Some studies suggest we are more impulsive the closer we feel to the person we are deciding for, while others suggest the reverse. This might be because some researchers ask participants what they would do while others ask what they should do. Order of condition presentations also affects how we discount for other people. We investigated the impact of should/would question type on social distance manipulations in delay discounting using a within-subjects design. Participants completed a delay discounting procedure for both themselves (“You would”) and for a comparison condition (either; “Other would”, “Other should”, or “You should”). Discounting rates are determined by a complex interaction of would/should question type and condition presentation order.

9:45  **MORNING TEA**

9:45  **SESSION 2 – Chair: Doug Elliffe**

10:15  **Broadening the base of applied behaviour analysis to solve real-life relationship problems**  
Brett Furlonger  
*Monash University*  
Background: Modern counselling has, to all intents and purposes, become synonymous with cognitive psychology. However, this need not be the case as an approach that stresses operant learning, and determines the relationship among antecedents and a behaviour or a response to be changed, can be learned and applied effectively in the counselling setting.  
Aims: To design a behavioural counselling learning program for pre-service counsellors using the behaviour skills training (BST) procedures of modelling, instruction, rehearsal and feedback. There was a focus on designing the program to assist counsellors help clients understand the impact of their behaviour on themselves, significant others, and their environment. Additional skills involved teaching counsellors to help clients identify their goals, required behaviour changes, maintaining behaviours and to understand the function of their problem behaviours.  
Method: The learning program was designed collaboratively, and, depending on team preferences and styles, these meetings took on different forms and timelines. For example, general planning involving brainstorming were longer and less organised. In contrast, as the program progressed meetings became more focussed and time limited. As the project neared the end the relevant documents were often shared, discussed and modified via email and digital cloud drives.  
Results: At the end of the design period, 14 micro-skills that were representative of a behavioural approach to counselling, were selected. Each micro-skill involved identifying a specific goal, the provision of practice indicators, expected consequences on the client, and a rehearsal activity. Repeat trials demonstrated that the 14 micro-skills could be taught in a four-hour time block with a one hour follow-up.  
Conclusions: The 14 micro-skills of behavioural counselling were calculated to be applicable to most relationship problems, although it was considered that not all 14 would have to be used in each situation. The use of the 14 micro-skills were considered to represent an appropriate behavioural approach to counselling.  
Discussion: Challenges and philosophical tensions remain regarding the content and time available to teach the micro-skills but it was acknowledged that courses are limited by Faculty funding and by the number of hours required for a University post-graduate degree.
**The effect of differential outcomes pre-training on tact acquisition**  
Jessica McCormack, Javier Virues-Ortega, Doug Elliffe  
*The University of Auckland*

The differential outcomes procedure has been shown to enhance conditional discrimination learning. When subjects are trained with reinforcers specific to the training stimuli they acquire conditional discrimination faster than when trained with a common reinforcer. The procedure has also been shown to improve acquisition of equivalent relations. Two children with pervasive developmental disorders were taught 3D and 2D shapes using the DOP or NDP, along with related objects, nets, and written labels. When tested for equivalent relations between the different stimuli, both responded more accurately (within-class responding) in the DOP condition. One participant did not fully demonstrate equivalence in the NDP condition. The study provides evidence of the potential benefits of the DOP in applied settings.

**Applications of ABA in the clinical population going beyond children with autism**  
Jayden Ward¹, Megan Borlase², John Wooderson¹, Esther Syred¹, Belinda Cox¹, Laura Roche¹, Christopher Murray¹, Carl Patterson¹  
¹Lojic Institute, ²University of New England

Applied Behaviour Analysis (ABA) is most commonly discussed in terms of its clinical application with children with autism. The principles of behaviour are unlimited. To support this we review some cases that involve the use of procedures including functional communication training (FCT) and multiple schedules with adults with multiple disabilities to highlight the utility of ABA beyond children with autism.

**COFFEE BREAK**

**SESSION 3 – Chair: John Bai**

**Replication: What it is good for?**  
Michael Davison  
*Pensioner University*

In which I shall argue that replication is not the gold standard in Psychology; that the “Replication Crisis” is not a crisis at all but an opportunity; and that attaining a replication is bad for our science because it forces constraints on our knowledge and understanding. Psychology is one great blooming, buzzing confusion, which we should accept and learn to love. There are more things in Heaven and Earth, Horatio, than are dreamt of in your philosophy. Yea!

**Why we should use rank-permutation testing for behavioural data**  
Douglas Elliffe¹, Martin Elliffe²  
¹The University of Auckland, ²East Bay Specialist Centre

We advocate for rank-permutation tests as the best choice for null-hypothesis significance testing of behavioural data. We provide an algorithm that enables exact-probability versions of such tests without recourse to either large-sample approximation or resampling approaches. We particularly consider a rank-permutation test for monotonic trend, and provide an extension of this test that allows unequal number of data points, or observations, for each subject. We provide an extended table of critical values of the test statistic for this test, and both a spreadsheet implementation and an Oracle® Java Web Start application to generate other critical values at [https://sites.google.com/a/eastbayspecialists.co.nz/rank-permutation/](https://sites.google.com/a/eastbayspecialists.co.nz/rank-permutation/).
On the origins of 'computationally complex' behaviour: Evidence from an artificial algebra
Randolph Grace
University of Canterbury

Why does mathematics describe the physical world? How can our mind perceive mathematical truth? And why does so much adaptive behaviour - from spatial navigation to complex motor skills - require mathematics to describe? One possibility is that mathematical knowledge may be embedded in how we perceive the world. We describe results from several psychophysical experiments which have tested how we compare stimulus magnitudes. According to a well-known conjecture of Torgerson (1961), observers perceive only a single relation between stimuli, that is either a ratio or difference, but which one cannot be determined empirically. We used a novel ‘artificial algebra’ in which observers learned to produce non-symbolic ratios or differences by feedback and without explicit instruction. Observers responded accurately in both ratio and difference tasks, but analyses showed that responding was controlled jointly by both relations, with the untrained relation predicting significant variance in about half of individual cases. We conclude that Torgerson’s conjecture is false and that the perceptual system automatically computes both differences and ratios when comparing stimuli. Evidence for two operations suggests that the perceptual system may represent elements of an algebraic field. Such a representation could endow organisms with the ability to perform ‘computationally complex’ behaviour, such as spatial navigation, that requires mathematics to describe.

SESSION 4 – Chair: Jessica McCormack

Using a stimulus equivalence protocol to teach concepts of single-subject designs
Queenie Leung, Katrina Phillips, Sarah Cowie
The University of Auckland

The present study examined the utility of a stimulus equivalence protocol in teaching concepts of single-subject experimental designs to university students. Participants were first trained on certain relations among the names, graphs and definitions of each experimental design. They were subsequently tested on their performance on untrained relations among these stimuli. For study 1, participants were postgraduate students who also attended a lecture that aims to teach single-subject designs. Some participants had some prior knowledge on the topic. They were tested on the untrained relations both before and after the lecture. Results showed an improvement of performance for 5 out of 9 participants after the lecture, while a decline of performance was observed for 4 out of 9 participants. Some participants showed emergence of symmetry relations without training. Most participants demonstrated emergence of equivalence relations following training on the stimulus equivalence protocol, and generalization to novel graphs and clinical vignettes. For study 2, participants were undergraduate students who had little to no prior knowledge on the topic. Preliminary results showed emergence of symmetry and equivalence relations for all participants following training on the stimulus equivalence protocol. The study extended previous findings that an equivalence based instructional paradigm can be effectively applied to teach academic materials to more advanced learners.
Why choose between “train-and-place” or “place-and-train” when you can do both? Using simulated setting training to enhance job-site training of individuals with intellectual disability

Michelle Holtzhausen, Katrina Phillips
The University of Auckland

Three individuals with intellectual disability are trained six job tasks in total: two job tasks at each of the three different training settings. The training settings are (1) simulated-setting alone, (2) job-site alone, and (3) a combination of simulated-setting and job-site. A multiple-probe design across job tasks and participants is used to assess the effects of the training settings on their skill acquisition, generalisation, and maintenance of the performance of job tasks. The goal is to identify the training setting that is most effective.

Behavioural Skills Training package: Teaching teachers to implement the IISCA

Rhian Collings

Within the classroom setting, teachers often lack the necessary skills to assess, manage and intervene with problem behaviours of children with ASD. This can lead to undue stress on both teachers and students. There is a critical need for teachers to be equipped with the skills to assess the function of problem behaviours and to design and implement strategies that reduce these behaviours. The Interview Informed Synthesised Contingency Analysis (IISCA), developed by Hanley, Jin, Vanselow and Hanratty (2014) is a variation to the traditional functional analysis (Iwata, Dorsey, Slifer, Bauman & Richman, 1994). It utilises a questionnaire to synthesise the potential contingencies maintaining problem behaviour into experimental test and control conditions, whilst also informing the implementation of Functional Communication Training (FCT; Tiger, Hanley & Bruzek, 2008). With research supporting the IISCA as an effective, brief and straightforward measure to determine the function of problem behaviour and inform an effective intervention, this analysis may be well-suited to the classroom setting. The aim of the current study was to assess the effects of a Behavioural Skills Training package on teachers reliable implementation of the IISCA and FCT procedures and further, assess the effects of these procedures on children’s problem behaviour. Across two teacher participants and three students, findings have identified high procedural integrity in IISCA and FCT implementation, an overall reduction of students problem behaviours and an increase in their alternative behaviours.

Using eye-tracking to explore gaze behaviour of primary school children to text: How do they locate relevant information?

Bradley Drysdale, Angelika Anderson, Brett Furlonger, Dennis Moore
Monash University

Strategically and effectively locating relevant information in text is an important skill for reading development and appears to be strongly associated with improved comprehension accuracy. A sample of 19 primary school students, aged 6 to 12 years read age-appropriate texts and answered questions about the texts, while their gaze was recorded via eye-tracking. Participants were categorised into “High” and “Low” groups based on their reading competence. A task analysis was conducted to identify the search strategies used by students to locate information related to the answer. The “High” competence group was more likely to use and be more effective at using the Linear search strategy, a systematic strategy requiring sequential decoding, than the “Low” competence group. The “Low” group exhibited the less effective and random Haphazard to locate answers. The group difference can be explained by response efficiency (Horner & Day, 1991). Implications for teaching students to read and locate answers are discussed.
Discriminating good from bad writing: Electrophysiological and behavioural correlates
Stephen Provost, Erin Corkett
Southern Cross University
The OLT-funded project “Improving Students: Writing in Psychological Science: An Interactive Workbook Approach” provide strong evidence that the ability to discriminate good from poor writing was related to academic outcomes and weaker evidence that this ability could be enhanced by participation in a simple discrimination learning task. In this experiment performance on the discrimination task was correlated with a standard measure of language functioning, the National Adult Reading Test (NART), and with the N400 event-related potential (ERP). There was no correlation between performance on the discrimination task and either the NART or the N400 as conventionally defined. However, moderate (>0.6) negative correlations were found between discrimination task performance and the absolute amplitude of the ERP to congruent words at a number of electrode sites. Intriguingly, although the correlations with ERP amplitude to incongruous words were not statistically reliable, they appeared to be in the same direction as those to congruous words. The ability to discriminate between good and poor writing may be related to some other aspect of linguistic performance shared by both of these conditions, such as, for example, fluency.

COFFEE BREAK

SESSION 5 – Chair: Randy Grace

Investigation into slot machine information displays
Shannon Garland Duignan
Victoria University of Wellington
Electronic gaming machines (EGMs, slot machines) are arguably the largest contributor to problem gambling. In New Zealand, regulations specify that all EGMs must have harm minimisation tools in the form of interruptive pop-up displays --- a break providing players with session information and an option to continue or quit play. Despite nationwide implementation, their effectiveness remains unclear. We are analyzing a data set collected from EGM play in New Zealand that we first filtered to ensure dataset quality. We found that of all pop ups that appeared during the week, only 1.93% resulted in the player quitting the game. This indicates pop ups have minimal impact as a harm minimisation intervention tool. Analysis also revealed the differences in how manufacturers have interpreted and implemented regulations which requires further investigation. We also explored possible predictors of pop-up display effectiveness (players quitting games in response to pop ups). Preliminary results will be discussed.
Gain-loss asymmetry in local effects of reinforcers in humans
Rana Asgarova
Victoria University of Wellington
Differential effects of gaining and losing on subsequent behaviour in operant tasks are not well understood. We examined responding to gains and losses in a rapid-acquisition choice procedure using concurrent variable-interval schedules in the Auckland Card Task. Participants repeatedly chose between two decks of cards that varied in the frequency of scheduled gains or losses. We analysed local effects of experiencing gains and losses immediately after a target (real) outcome. We also corrected for general patterns of responding to each deck in order to isolate behaviour unique to real outcomes. We did this by inserting hypothetical outcomes into acquired data after randomly chosen responses that did not produce a real outcome and examining the pattern of responding after these hypothetical outcomes. Results showed a difference between responses after real and hypothetical outcomes, suggesting that behaviour after gains and losses differs from the general pattern of responding during the task. Both gains and losses produced a decreased tendency to immediately stay on the same side. Analysis of subsequent responses indicated that gains increased and losses decreased the tendency to stay on the same side.

Control by past experience and external stimuli in uncertain environments
Stephanie Gomes-Ng, Douglas Elliffe, Sarah Cowie
The University of Auckland
The natural world is full of uncertainty. Hence, organisms must rely on past experience, and on external stimuli (e.g., advertisements, footprints, the behaviour of conspecifics), to predict important future events (e.g., food delivery). Previous research suggests that the strength of control by past experience and external stimuli depends on the amount of uncertainty in the environment: As events become more predictable, organisms tend to rely more heavily on past experience and less heavily on external stimuli. We investigated whether this is the case when changes in environmental certainty occur over time. Pigeons responded on a concurrent schedule in which one key was more likely to deliver reinforcers than the other key, and the location of the locally richer key changed across time since a reinforcer delivery. To manipulate local environmental certainty, we varied the probability of a reinforcer delivery on the locally richer key while keeping the overall reinforcer ratio constant. Keylight-colour stimuli strongly controlled choice and reinforcer ratios exerted weak control regardless of local environmental certainty. Thus, the degree of control by past experience and external stimuli appears to be determined primarily by global, not local, environmental certainty.

Left-Left-Right-Right: The effect of conditional probability on choice preference and reinforcer-evoked potentials
Stuart McGill, Douglas Elliffe, Paul M. Corballis
*thought-wired, †The University of Auckland
Reinforcement is a fundamental process of learning. However, the underlying mechanisms by which reinforcers change behaviour have yet to be determined. Recent research has challenged the traditional strengthening account of reinforcement, instead suggesting that reinforcers act as discriminative stimuli, signalling which actions will be more likely to produce further favourable outcomes. To investigate this issue, we examined the event-related potentials (ERP) evoked by reinforcers and choice preference in both discrete-trials and concurrent-chain procedures. In both experiments, a sequence of reinforcers was arranged, such that the identity of each alternative producing the next reinforcer was predictable by the source of the last two reinforcers. Additionally, in the concurrent-chain procedure, during the terminal link, the probability of receiving more than one reinforcer was low. So, on a local level, the delivery of a reinforcer signalled a substantial reduction in the immediate reinforcer probability. Results were consistent with the predictions of the signalling account, with participants reducing their terminal-link response rates after reinforcer delivery and adapting their choice preference in accordance with the reinforcer sequence.
4:00  COFFEE BREAK

SESSION 6 – Chair: Stef Gomes-Ng

4:15  Choice under stimulus control
Darren Baharrizki, John Y. H. Bai, Douglas Elliffe
The University of Auckland
Stimulus control operates when organisms discriminate between different stimuli within the context. Generalization occurs when organisms misallocate the reinforcers obtained in the presence of one stimulus to other visually similar stimuli. Choice behaviors occur within various environmental contexts; however, it is unclear how choice generalizes across stimuli that are visually similar. Therefore, the current study measured choice under stimulus control by training pigeons on a two-component multiple concurrent schedules where reinforcers were arranged on a 1:5 ratio on left and right keys in the presence of 530 nm, and on a 5:1 ratio in the presence of 560 nm. After training, generalization tests presented untrained colored key-light stimuli ranging from 510-580 nm. Relative rates of responding followed the relative reinforcer rates in baseline, and response allocation generalized across the test stimuli as a function of the similarity between the trained and tested stimuli. Therefore, similar to generalization of single responses, response allocation across two concurrently-available alternatives also generalizes across similar stimuli.

4:30  Influences of graphical image pairing on product preference
Xiaosha Meng, Tim Edwards
The University of Waikato
Many advertisements appear to rely on higher-order respondent conditioning to alter preference for a product brand. Given that higher-order conditioning is difficult to achieve, there may be other processes, such as those involved in stimulus equivalence, at work. The current experiment paired six ‘brand’ stimuli with three different types of pictures. Three brands were paired directly with the pictures and the other three paired indirectly using a stimulus equivalence procedure. The three types of pictures were ‘negative’ (typical consequences of ingesting excessive sugar, such as heart disease, tooth decay, and diabetes), ‘neutral’ (pictures of geometrical shapes) and ‘positive’ pictures (pictures related to health and fitness). We used a respondent procedure, which is more similar to real marketing methods than operant procedures, as used in previous research in this area. A preference assessment was conducted to evaluate the transfer of function from the picture to the brands by investigating whether the pairings influenced participants’ preference for branded soft drinks. The results showed that negative pictures shifted preference more than positive pictures and direct pairing was more effective than an indirect pairing procedure. These findings and future research with this type of procedure may contribute to our understanding of the mechanisms that are responsible for the effectiveness of certain types of advertising, which might, in turn, help us to understand how to counter these effects. Additionally, we may be able to further develop and apply these methods to change the value of stimuli that are either harmful or healthy and thereby encourage healthier lifestyles.
Food preferences of a captive wombat population
Tina McAdie
Central Queensland University

The food preferences of nine captive southern hairy-noised wombats (Lasiorhinus latifrons) were tested. The foods offered were familiar (had been fed to the wombats in the zoo environment) or unfamiliar (novel) foods. These foods were also classed as being either natural (part of the diet of wild wombats) and unnatural (not usually in the diet of wild wombats) foods. The food types tested were: Pellets (standard food fed to wombats in the Zoo: unnatural but familiar), Carrots which were also part of their standard Zoo diet (unnatural but familiar), Guinea grass (natural and familiar), Kangaroo grass (natural but unfamiliar), and Sweet potato (unnatural and unfamiliar). Experiments were conducted in the feeding pen. Wombats were tested individually. Wombats were offered two food types over several trials in each experiment. All four food types were tested individually in comparison to pellets. The results showed that there were strong individual preferences for different foods, but that overall pellets were the preferred food. However there is some debate as to how best measure ‘quantity’ of such disparate types of food consumed (dry or weight weights, nutritional value?). Other behaviour (both food-seeking and non-food-seeking) was observed. These may give further indications of food preferences.
Learning of perceptual relationships with implicit or explicit instructions and feedback
Kate Stuart
University of Canterbury
Recent reports have shown that small children and infants are able to compute arithmetic operations on non-symbolic magnitudes. This “number sense” is believed to provide a scaffolding for the future learning of formal mathematics, but how this is accomplished is unclear. Here we studied the effects of explicit instruction and feedback on performance in a non-symbolic “artificial algebra” task introduced by Grace et al. (2018) in which participants learned to estimate the ratios (Exp. 1; N = 23) or differences (Exp. 2; N = 39) of line pairs. In each experiment, participants were randomly divided into groups that did or did not receive explicit instruction and feedback, and completed four blocks of trials. We found that in both experiments, responding was faster and more accurate in the first block for the explicit group, but in subsequent blocks accuracy was similar for both groups. Multiple regression analyses showed that control by the trained relation was increased with explicit instruction in Experiment 1 (ratios) but not Experiment 2 (differences). Although participants responded accurately overall in both experiments, the greater impact of explicit instruction in Experiment 1 may indicate that participants are predisposed to compare lines in terms of differences in this task.

Delayed information and suboptimal choice
Alejandro Macías Ayala\textsuperscript{a,b}, Valeria V. González\textsuperscript{a}, Randolph C. Grace\textsuperscript{b}, Armando Machado\textsuperscript{a}, Marco Vasconcelos\textsuperscript{a}
\textsuperscript{a}University of Minho, Portugal, \textsuperscript{b}University of Canterbury
In a choice procedure where one alternative leads to distinctive cues reliably signalling the presence (S+) or absence (S-) of food after a delay, and another alternative leads to cues unreliably signalling the outcome (S\textsubscript{3} or S\textsubscript{4}), pigeons prefer the former even if that alternative is associated with a lower rate of overall reinforcement. The Information provided by the cues (certainty about the outcomes) has been invoked as an explanation for this suboptimal preference. Two experiments delayed the time at which S+ or S- became certain. In Experiment 1, choosing the low rate alternative always led to a cue that could either stay on for the entire delay ending in FOOD or switch to a reliable S-. In Experiment 2, the low rate alternative led to a cue that could either stay on for the entire delay ending in NO FOOD or switch to a reliable S+. In both cases preference for the low rate alternative diminished as a function of the time of the possible cue switch. However, the rate of decreasing was slower when S+ was reliable (Exp 2) than when S- was reliable (Exp 1).

The past haunts us – but when, how, and why?
Peter B.C. Kim\textsuperscript{a}, Stephanie Gomes-Ng\textsuperscript{a}, John Y. H. Bai\textsuperscript{a}, Jason Landon\textsuperscript{b}, Sarah Cowie\textsuperscript{a}
\textsuperscript{a}The University of Auckland, \textsuperscript{b}Auckland University of Technology
Conflicting information in the environment is unavoidable. When stimuli in the present provide conflicting information, relative reinforcer rate determines the degree to which each exerts control over behaviour. Much less is known about conflict between past and present information. We examined how behaviour was controlled when stimuli in the present provided information that was in conflict to information provided by stimuli in the recent past. Pigeons worked in a concurrent chain schedule in which reinforcers occurred earlier in one terminal link and later in the other. In some trials, the outcome of the trial (sooner or later reinforcer) was signalled throughout the trial by keylight stimuli. Sometimes, the stimuli changed upon entry into the terminal link, creating a conflict between past and present stimuli. In half of these conflicting trials, the response that produced entry into the terminal link was congruent with the stimulus in the initial link; in the other half, this response was congruent with the stimulus in the terminal link. Both past and present stimuli had been associated with approximately equal numbers of reinforcers, and were thus equally reliable. When past and present keylight stimuli conflicted, past stimuli continued to exert control over behaviour. The degree of control exerted by past stimuli was greater when the response that produced entry to the terminal link was congruent with the initial-link stimulus than the terminal-link stimulus.
10:00 MORNING TEA

SESSION 8 - Chair: Tim Edwards

10:15 Behaviour analysis in practice - The role of social validity
Winnie Chiu, Margaret Gertzog, Ebonee Hodder, Chloe Jones, Jacqueline Munro, Danielle Walden, Angela Arnold-Saritepe
The University of Auckland
When a person sits down at a personal computer and sees an icon indicating an e-mail message, they click on it. Here, the icon is the stimulus that controls the behaviour of opening the e-mail inbox. But what if the behaviour of opening the e-mail inbox is under the control of an ‘irrelevant’ antecedent stimulus and the e-mail box is opened at times when there is no e-mail? Or if the target behaviour of opening e-mail is not in the person’s behavioural repertoire at all. This presentation will present a selection of case studies highlighting how behaviour analysts bring about stimulus control and/or transfer stimulus control to ‘relevant’ stimuli.

10:45 Teaching extended communication sequences to children with developmental disabilities
Anastasia Sawchak, Jeff Sigafoos, Hannah Waddington
Victoria University of Wellington
Children with developmental disabilities often have severely limited speech and language development and might therefore benefit from alternative and augmentative communication (AAC) intervention. Whilst there exists extensive literature demonstrating effective procedures for teaching children with developmental disabilities and severe communication limitation to use AAC, studies in this area have mainly focused on teaching relatively short and single-function communicative exchanges, such as teaching the person to request access to a preferred object by selecting a single symbol on a speech-generating device. While requesting access to a preferred object is useful, it would also seem important for children to be able to engage in more extended and multi-functional communication exchanges. There is currently little published research into the development and evaluation of procedures for teaching more extended, multi-function communication sequences, such as teaching the child to (a) first greet his or her listener, (b) then make a request for a general object (“I want a snack.”), (c) then make a request for a specific object (“I want popcorn.”), and (d) then thank the listener for providing the requested item. The aim of this research is to determine whether or not children with developmental disabilities and severe communication impairment can learn to produce such extended and multi-functional communication sequences using systematic instructional procedures and an iPad-based speech-generating device.
“Faking good” or real improvement following behavioural treatment of pediatric sleep disturbance (PSD)?
Neville M Blampied, Shannae Wilson, Karyn France

University of Canterbury

A quarter or more of families with typically developing infants experience pediatric sleep disturbances (PSD) during their child’s first 2 years, including difficulties in the child initially settling to sleep and frequent and/or prolonged night waking. PSD is disruptive to child development and stressful for parents and siblings. There are a number of empirically established behavioural interventions for PSD including the parental presence procedure, which addresses parent-mediated antecedents for sleep initiation and consequences for sleep disturbance while minimising potential child distress. PSD is typically assessed by parent-recorded sleep diaries and such data has consistently shown improvements in child sleep, however, it is not known if objectively measured changes in actual sleep architecture accompany parent-observed changes. Three typically developing boys aged 6 -12 mo who exhibited PSD were treated using the parental presence procedure. In addition to sleep diaries sleep was monitored by videosomonomography yielding objective sleep-state data, including quiet awake duration and active/quiet sleep transitions. Results from a multiple baseline across participants showed that improvements reported in diary data were matched by improvements in sleep architecture. This supports the conclusion that behavioural interventions for PSD produce real improvement in sleep.

SESSION 9 – Chair: Katrina Phillips

Personal recollections on the early days of ABA in New Zealand
Barry Parsonson

Applied Psychology International

The early years of ABA in New Zealand involved introducing, applying and promoting Applied Behaviour Analysis in the fields of Educational, Clinical, Developmental and Forensic Psychology. The 1960s and 70s saw an expansion of University programmes and the emergence of a cadre of graduates who took application into a range of professional environments in New Zealand and overseas. The origins of NZABA lie in the establishment of the Division for Behaviour Analysis within the NZ Psychological Society in 1973 and in the links formed by our academic Behaviour Analysts with the then emerging ABAI and SABA in the USA. This presentation outlines some of that history and the people involved in advancing ABA in the early days of its development in this country.

Comparison of reinforcer assessments with individuals with Autism Spectrum Disorders
Megan Borlaseabc, Tina Sidenera, Ruth DeBara, April Kisamorea, Danielle Gureghiand
acaldwell university, aLogic Institute, cUniversity of New England, dGarden Academy

Identifying reinforcers is critical to both clinical practice and research with individuals with developmental disabilities. Although there is a wealth of research on preference assessments, to date no studies have been conducted to identify optimal procedures for conducting reinforcer assessments. This information is important to validate new preference assessments, to evaluate stimuli that are being established as conditioned reinforcers, and in reinforcement research to provide evidence that stimuli being used function as reinforcers. The current study compared three RAs with social and tangible stimuli. The tangible reinforcer assessments supported the current research as the high-preference item were the most potent reinforcers for all participants. There was more variability with the social reinforcer assessments and the concurrent-operants reinforcer assessment did not support the current research for any of the participants.
Functional assessment of caregiver non adherence to behaviour plans
Angela Arnold-Saritepe
The University of Auckland

A plethora of literature exists in the area of parent training. Parent training of behaviour plans often involve Behavioural Skills Training approaches that involve verbal and written instruction, modelling, rehearsal and feedback. While this strategy can be very effective, what do we do when it doesn't work? We train and train some more, assuming the caregiver doesn't know how or does not have the skills to implement the intervention. We may even 'write the family off' stating they 'have no capacity to change'. However, in truth the family may know how and may have the skills yet continue to fail to implement the intervention strategies. As behaviour analysts we need to look at the whole context. Why are we not conducting functional assessments on families? This paper aims proposes how as behaviour analysts we may include family functional assessments as a matter of course.

12:15 PRIZEGIVING + FAREWELL

12:30 LUNCH + POSTERS

POSTERS

Thinking about our past does not impact self-control
Zoe Walsh
Victoria University of Wellington

Can our memories help us make better choices? Some studies have found retrieving memories before decision making promotes self-controlled choices, while others have found this has no effect. The current study investigated whether specific or general memories differentially impacted self-control. Using a within-subjects design, self-control was assessed by a monetary decision making task in three conditions: specific memory, general memory and a control condition. From previous literature, it was hypothesized that specific memories would make choice more self-controlled. However, results showed no effect on self-control across all conditions. These are unexpected results, which suggest that memory retrieval before decision making may be an unreliable intervention.

Smoke alarm tampering in student accommodation: A behavioural intervention
Lydia Chapman
Victoria University of Wellington

Tampering with smoke alarms is a breach of the rules for students living in Victoria University's halls of residence. This behaviour also creates a major health and safety risk, increasing the likelihood of serious injury or death in the event of a fire. In 2017, a hall of residence manager identified that residents were tampering with their smoke alarms, and requested that we devise a behavioural intervention to reduce the frequency of tampering incidents. Data obtained from tampering incident reports revealed that 1 percent of residents accounted for 50 percent of all tampering incidents in 2017. This suggested that an intervention needed to target recidivist offenders. This poster documents the creation of an intervention plan, requiring those who tampered with a smoke alarm to sign an individualised behavioural contract detailing why they broke the rule, and how the rule would not be broken in future. The resident was required to generate these details. One hall is currently implementing this intervention, with the potential for other halls to adopt the practice in future.
Improving mental wellbeing among university students via a smartphone application based on Acceptance and Commitment Therapy
Fengshan Li, Rebecca Sargisson, Maree Roche
The University of Waikato

The number of university students experiencing mental disturbances is increasing. Due to the impact it has on students’ academic life, there is a need for an efficient, convenient, and cost-effective intervention which can be widely applied to university populations. Acceptance and Commitment Therapy (ACT) is an effective behavioural treatment for a range of psychological disorders. ACT has a transdiagnostic feature, as it focus on educating individuals to be aware of their internal experiences, such as thoughts and feelings and to accept them, instead of suppressing or avoiding them. The fundamental goal of ACT is to promote individual psychological flexibility when faced with challenging events by addressing their valued life goals. ACT Companion™ app is an ACT-based smartphone app which incorporates exercises to assist users achieve their treatment goals. I used a single-subject design to examine the efficacy of the ACT Companion™ app in reducing measures of stress, anxiety, depression, and psychological flexibility for 9 university participants. Graphs showed that app use lowered daily stress levels for all participants. At a group level, there was a significant decrease in anxiety, stress, depressive symptoms, and negative emotions. However, no significant effect of app use on mindfulness and psychological flexibility. Overall, the results suggest that the ACT Companion™ app is a promising approach for improving mental wellbeing among university students.

Derived relations between complex shapes using the differential outcomes procedure
Jessica McCormack, Javier Virues-Ortega, Douglas Elliffe
The University of Auckland

The differential outcomes procedure has been shown to enhance conditional discrimination learning. When subjects are trained with reinforcers specific to the training stimuli they acquire conditional discrimination faster than when trained with a common reinforce. The procedure has also been shown to improve acquisition of equivalent relations. Two children with pervasive developmental disorders were taught 3D and 2D shapes using the DOP or NDP, along with related objects, nets, and written labels. When tested for equivalent relations between the different stimuli, both responded more accurately (within-class responding) in the DOP condition. One participant did not fully demonstrate equivalence in the NDP condition. The study provides evidence of the potential benefits of the DOP in applied settings.

The triumphs and challenges of working with families, carers, and support workers
Jayden Ward, Megan Borlase, John Wooderson, Esther Syred, Belinda Cox, Laura Roche, Christopher Murray, Carl Patterson

Lojic Institute, University of New England

One of the biggest challenges we face as clinicians is getting buy in from the primary supports for our clients; parents, carers, and support workers. We can make a great deal of progress with our clients when we see them but unless we can get their support networks on board the progress will not maintain or generalise. We review our process for working with client support networks and discuss cases where we have had to use out of the box thinking to get buy-in.
Foundations Care
Esther Syred, Megan Borlase, Dane Jacka, Carl Patterson
Lojic Institute, Foundations Care
In 2017 and early 2018, the New South Wales State Government in Australia undertook a second phase of tendering for Out of Home Care services. The government sought organisations to deliver what they had described as Intensive Therapeutic Care services. The Intensive Therapeutic Care approach created by the NSW government formed part of a broader reform of the Out of Home Care services. Intensive Therapeutic Care was designed to re-position residential care services to children in NSW as intensively therapeutic. 52 organisations tendered to provide the service. All 26 existing residential care providers tendered. 8 organisations have been contracted to deliver the service. Foundations Care is the only new provider contracted. A critical element to the Intensive Therapeutic Care model is the creation of specialist staffing resources to develop therapeutic plans for the young people accessing the services. Foundations Care proposed the recruitment of individuals with clinical expertise in behaviour science – with a particular ambition to recruit Board Certified Behaviour Analysts to lead the service response.

Quantitative review of the application of ABA in dementia care
Megan Borlaseab, Laura Rocheab, Lewis Bizo, John Malouffb, Elizabeth Kyonka, Stuart Wark, Debra Dunstan
abLojic Institute, bUniversity of New England
We conducted a quantitative review of the Applied Behaviour Analytic research addressing dementia care from a behavioural perspective. We included studies that focused on applying behaviour principles to change behaviour in individuals diagnosed with dementia or Alzheimer’s disease. We coded the research based on a number of parameters including age of participants, location of the study, implementers of the procedure, independent and dependent variables, and outcomes. This poster is a summary of the methods and results of the review and presents limitations in the current research as well as directions for future research into dementia care.

Lojic Institute
Megan Borlaseab, John Wooderson, Esther Syred, Jayden Ward, Belinda Cox, Laura Roche, Christopher Murray, Carl Patterson
abLojic Institute, bUniversity of New England
Lojic Institute is a division of Community Services Australia and is the behavioural/clinical services/practice development arm of a large not-for-profit organisation called Community Services Group. Lojic serves communities in Queensland, Tasmania, and New South Wales, and supports the other companies in Community Services Group in Western Australia. Lojic staff receive training and supervision in Applied Behaviour Analysis (ABA) and supported to undertake additional professional development in ABA and complementary disciplines. Lojic provides behaviour support services to a wide range of clients including those requiring aged care, residential care, foster care, and disability services to promote quality of life outcomes through a commitment to human rights. Lojic also supports organisations through practice development and training. Lojic has recently been accredited as an ACE provider by the BACB. Lojic works in partnership with the University of New England to conduct research and acts as the bridge between theoretical ABA and clinical ABA.
**Detection of pest fish with dogs**
Laura Seal, Tim Edwards, Clare Browne, Margaret Crawford  
*University of Waikato*

Efficient management of invasive species requires reliable and feasible methods of detection. Common practices in the detection and monitoring of invasive fish, such as electro-fishing, are often inefficient at detecting fish at low densities and can harm indigenous aquatic species. In this study, we are investigating the utility of dogs (*Canis familiaris*) for the detection of koi carp (*Cyprinus carpio*) at biodiversity thresholds applicable to operational settings. Water samples taken from tanks containing koi carp (target), goldfish (control), or no fish (control) were systematically diluted and randomly arranged in an automated apparatus. Three dogs were trained to indicate the presence of the target species by sniffing the sample for a set duration. All dogs demonstrated correct indications (hits) and correct rejections at or above the specified criterion (80%) at an extreme dilution (a concentration of 0.024% aquarium water). However, a control test indicated that the dogs were responding to stimuli irrelevant to the samples. Additional sample presentation controls were put into place, resulting in a marked decrease in correct indications and correct rejections. With a subsequent return to a higher concentration (0.098%), the dogs are now meeting criterion again. Further results are pending.

**Art, mood, and consequences: Effects of colouring on mood and sensitivity to reward and punishment**
Celia Lie, B. Alsop, B. Rose, J.A.M. Flett, and H. Wang  
*University of Otago*

Over 1 in 5 New Zealanders are diagnosed with depression or an anxiety disorder at some point during their lives. Prolonged depressive symptoms may be associated with altered sensitivity to reward and punishment. Another area of research suggests that colouring-in pre-drawn pictures has beneficial effects for decreasing depressive symptoms (e.g., Flett, et al., 2017). Thus, we might expect colouring to also have an effect on sensitivity to reward and punishment. The present study looked at whether 15 minutes of colouring could decrease self-reported symptoms of depression and mood disturbance, and whether decreases in depression and mood disturbance corresponded with altered sensitivity to reward and punishment in a probabilistic selection task. 75 undergraduate students completed mood disturbance and depressive symptom questionnaires, both immediately before and after either: 15 minutes of colouring in pre-drawn pictures (Art condition), or completing logic puzzles (Puzzle control condition). They then completed a probabilistic selection task to measure sensitivity to reward and punishment (Whitmer, Frank, & Gotlib, 2012). Overall, the participants in the Art condition had greater reductions in mood disturbance and depressive symptom scores than participants in the Puzzle condition. However, no significant differences were found between the Art and Puzzle groups for measures of sensitivity to reward and punishment. It is possible that a positive mood manipulation (e.g., colouring) is less effective than a negative mood manipulation (e.g., rumination) at altering sensitivity to reward and punishment. Additionally, a task that clearly measures sensitivity to both local and global rates of reward and punishment may be better suited for future research in this area.