Corin Ward

Internship Report

Diary of an Internship at PRI for Application to CICASP Masters Course

July 1st – July 9th 2010

Thursday 1st July

I arrived at Nagoya airport in the morning, and set off on the train for Inuyama as soon as I could. I love travelling on trains, anywhere. Somehow, it feels more genuine than road travel, because usually people don't design buildings with how they look from the railway in mind, the way they do with roads. This was my first view of Japan, and as always in a new country, it felt like a total sensory overload. I love that feeling! It makes me feel like i've just tasted hundreds of different sweets of flavours I could have never imagined. If there is such a thing as visual greediness, this is definitely it - it makes me wish to have at least 60 eyes. I wonder if pigeons ever feel like that with all the visual complexity they see?

Well, the backs of houses in Japan are very beautiful. There are no large housing complexes full of identical houses here, every building is slightly different... a different style, or colour, or a different roof, but they all seem to fit together to compose a picture that forms a congruent whole. And the style of the houses is so different from anything i've seen before anywhere i've travelled. Japan is a truly unique country I think.

Some of Inuyama's varying rooftops...

I arrived at PRI totally exhausted, but really excited to be there. I hadn't slept since Tuesday, but I didn't want to sleep yet, so Professor Tomonaga took me to the lunchroom and described what I was eating – I don't remember much, but it was huge and delicious. After that, I attended my first session in the basement, where the chimpanzees come to participate in the experiments.
The first chimpanzee to attend was Pendesa. As she sat down in front of the screen, I realised I had never seen a chimpanzee from this close before. Her ear was really striking. I suppose I had never considered what a chimpanzee's ear might really look like before, and just imagined it was like a humans. But it's totally different! The outside flesh of the ear is comparatively smaller, with a fairly wide circle of lumpy flesh in the middle, which in Pendesa's case is rose pink with small black flecks. (I found out later that some of the other chimpanzees have black flesh in the middle.)

Kaneko-san described his experiment to me as Pendesa performed the matching to sample task. He is a “scientific philosopher”; his interests are those that are also central to some parts of philosophy, like consciousness, and free will. But it's really exciting to see how easily he turns a philosophical question into an idea for scientific research. There's no need for sitting around and trying to come to the conclusion just through logic and reasoning when you can do that!
The matching to sample task was training for an experiment to find out whether attention and consciousness can be distinguished in chimpanzees. I tried to understand the definitional difference, but it was no good, my brain was too tired. I could barely even speak a full sentence, let alone understand this kind of topic! I slept so deeply that night!

Friday 2nd July

I attended Professor Adachi's session in the morning. I was looking forward to seeing his experiments because he had sent me a paper he wrote about the history and future of cross modal matching experiments before, and it was really interesting!

The session started with the synaesthesia experiment that a previous intern, Vera Ludwig had started with Professor Adachi when she was at PRI. Most of the chimpanzees had already completed the study, but Pan still hadn't reached the requisite level of correct matches, so she was still training on matching colour shapes. The experiment was to test whether a common type of synaesthesia found in humans – the identification of high pitched sounds with light colours, and low pitched sounds with dark colours, also occurred in chimpanzees. If it did, it's possible that this could have significance for the evolutionary development of the brain. Well, it turns out that chimpanzees do share this same kind of synaesthesia with us. I wonder how identity relations are constructed in the brain, and what differences there are between identifying a sound with a colour, and identifying sensory perceptions from differing modalities as the same object. Are they similar processes?

After that, the training for the cross modal matching experiments started. This time, the chimpanzees are matching symbols to conspecific's faces, and later the sound of their calls will be added in to see the effect it has on the matching. Cross modal matching is such a good methodology, I think; so many interesting things can be found out using it. I's going to be really interesting to find out more about other modalities too for chimpanzees, as not so much research has happened for that yet.

Over lunch, we discussed how interesting the basic questions of perception are in primatology are. What's it like to be a chimpanzee? How does chimpanzee perception differ from human perception? I think this is one of the most fundamentally interesting questions about any other living creature. It's really quite an amazing thing that we can have the kind of relationship with chimpanzees that allows us to understand some of their internal world!

I attended Professor Tomonaga's session again in the afternoon, and he explained some of his experiments to me. He has so many experiments going on at the same time! One of them is testing whether the way we depict motion in pictures and cartoons has any biological basis. We show movement in pictures through motion blur on one side of the object, or in cartoons by adding lines at one side of the picture (on the side the object or person has come from). Amazingly, it seems like there might actually be a biological basis for this! Of course, when we first see these kind of lines as a child, nobody has to explain to us what they mean. But I had never considered that it might represent something about how our brain processes visual images before. Thinking back to the synaesthesia results as well, it made me wonder just how much of our linguistic and pictorial representations are in some sense determined by brain processes and structure. I wonder if our understanding of some metaphors derives from these basic processes too, for example.

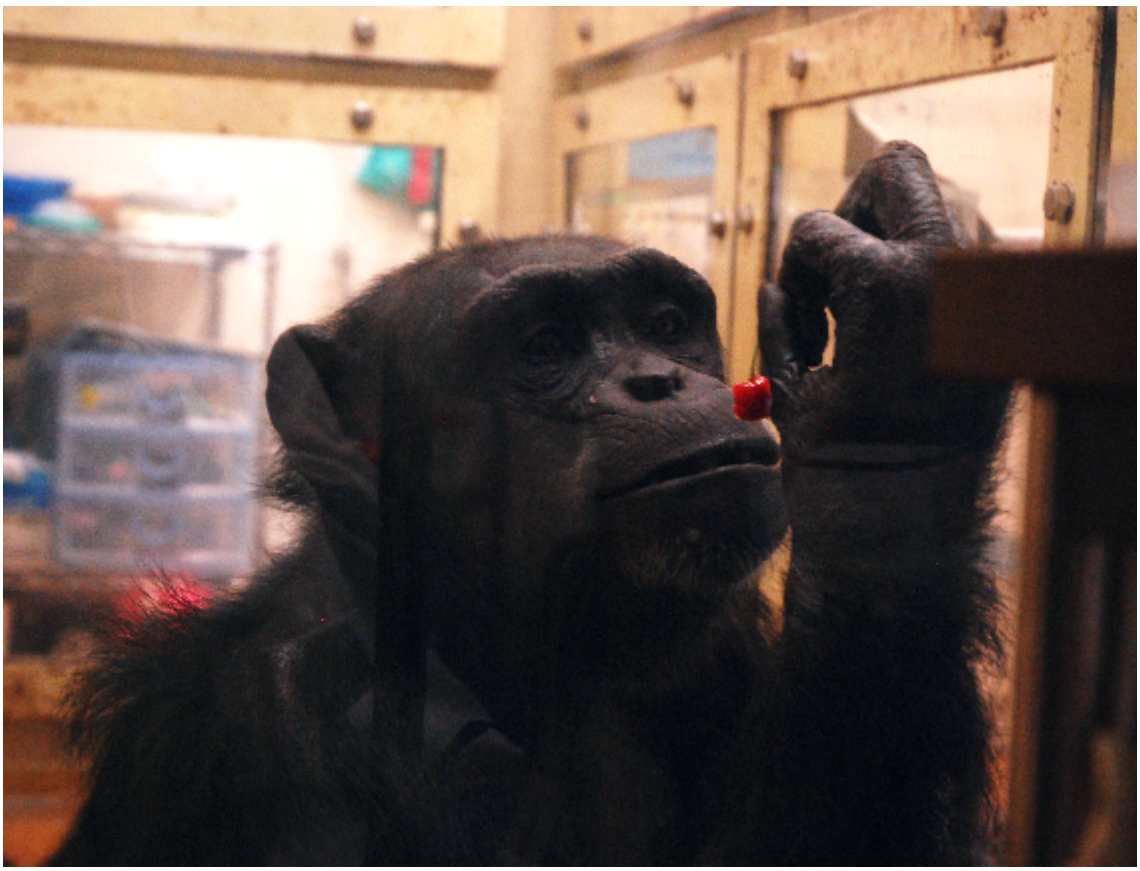
I also talked with Kaneko-san again about the difference between attention and consciousness. I wondered if Wittgenstein's duck-rabbit was representative of this distinction, since it seems that it's through the switching of attention, but not consciousness, that we perceive the picture one way or another. Kaneko-san showed me a computer generated version of change blindness, where pretty much everyone totally misses a large thing that was changing until it's pointed out to them. I decided to learn about the questions about attention and consciousness as soon as I had time.

That evening, Professor Tomonaga treated me and Lira Yu - a Masters student, to dinner at a sushi-ya. Course after course kept being brought out while we talked about various things, and the possibilities for future research into chimpanzee perception. In real life, this was an interview... but it's by far the best one i've ever had!! It didn't even feel like an interview at all, the atmosphere was so relaxed, and the food was absolutely delicious. Professor Tomonaga is a fun person to be around, and totally full of interesting ideas, and Lira is really kind and friendly, and easy to feel comfortable around. I really wish every interview could be so nice, and taste so good!

Saturday 3rd July

Today was my birthday! I woke up to the sound of the Chimpanzees pant-hooting, Japanese Macaques screeching, and some other strange but beautiful calls from a primate I had never heard before. I said hi to the Marmosets before heading to Professor Tomonaga's morning session in the basement. They are so cute, with their funny tilty little heads turning from side to side as they try to work out who, or what has come to see them.

Pan and Pal were attending the morning session, and Professor Tomonaga explained to me why we were filling the universal feeder with sweet potato instead of the normal apples for Pan. Pan becomes lethargic and uninterested in the cognitive tests in the humidity of the rainy season in Japan, so the sweet potato gives her a bit of extra incentive to participate. He made me laugh by telling me how previously the experiments had become a bit of an arms race with the food – when



Pan with a between test cherry.

Cleo training for Lira's Imitation research

some researchers started offering food the chimpanzees liked more, they didn't want to attend the sessions with less highly desired food as much any more, so for a while each researcher tried to give nicer food than the others. So now, only apple is used in most of the sessions, and exceptions are only given in individual cases like Pan's. I watched as Pan did the tests, saving up the pieces of sweet potato until she had about 5 pieces, or got a wrong answer. Its quite good planning by her really, since that way it's like there's less of a consequence of getting things wrong...

At the end of the session, Lira did a test for her Masters research, which is about chimpanzee's imitation and synchronised behaviour. It's really funny to watch the chimpanzees imitating patting their heads, or pointing to their mouths!

Lira invited us out for lunch at Yoshinoya, and Professor Adachi drove us there. Ueda-san chose for me, & I ate gyuudon for the first time. Japanese fast food is so much better than McDonalds!! And we didn't die from eating raw egg!!! It was great!!

We talked over lunch about some of the challenges zoos in Japan face for modernisation, and the success of Higashiyama Zoo's enrichment efforts and how it's helping to change perceptions on how zoos can be successful this way. I was surprised to learn that zoos in Japan still keep many different types of species, with only a few animals of one species in each zoo. Especially for the more social animals like primates, this is definitely not the best set up, and since there are quite a lot of zoos in Japan, it really doesn't need to be that way. But when I think about it, it's really not that long ago that zoos in Britain started to change, and the change has been pretty huge in a fairly short space of time. For example, London Zoo had a horrible reputation for the small enclosures and number of species for years. And my local zoo has changed dramatically since I was a child. I think the ability to transfer animals between zoos throughout Europe has helped a lot.

Afterwards, Professor Adachi bought me a Japanese birthday cake! It was chiffon chocolate cake, which is a really light airy type of cake, with lots of cream. Mmmmm. We sat in the common room and shared it while talking & laughing. Kano-san is a really funny guy!

In the afternoon I heard the same strange calls as I had that morning. They sounded more haunting as they echoed between the buildings in the afternoon rain. I followed the sound, searching for the source of the beautiful calls. I didn't find them then, but Lira told me it was gibbon's song. For the first time (of what has turned out to be a lot!) I wished I had brought a sound recorder instead of a camera to Japan.

Sunday 4th July

Today was a day off, so I decided to spend it doing one of my favourite activities – wandering around randomly and getting lost. Inuyama is very beautiful. I love the rice fields, people even keep small ones instead of back gardens! And the quiet roads with lovely old style Japanese houses, the sound of the cicadas, and the purple shadows of the car ports projected onto the ground in the summer sunlight. But it's also quite a small town, so it's not really possible to get as lost as i'd like!

After I got back, I decided to read the paper Kaneko-san had given me about attention and consciousness, and do some reading into other research on what the differences are. It turns out that research into whether top down attention is necessary for switching the perception of ambiguous shapes such as the duck-rabbit shows that this kind of switching actually can occur even when attention is totally withdrawn. So the switching actually occurs within consciousness, it seems. Also, there has been research done into whether withdrawing either consciousness or attention can produce different effects, and in fact, it does, for example in after images. So it really does seem like consciousness and attention are two separate processes that operate individually. It's not too

surprising that consciousness can occur without attention, I think, but that attention can occur without consciousness is a new idea to me.
I started thinking about something else Kaneko-san had talked with me about; the understanding of our own control over objects. For instance, how we understand that we move a pointer on a computer screen, and how there is a limit of error where we recognise the difference if the pointer is moving outside of our intended action. It would be good to find a more direct way of testing this kind of thing in chimpanzees. It's not really the same kind of thing, but I thought it could be really interesting to show chimpanzees a simplified pictorial form of their own EEG waves, and see if they could learn to identify them as their own, and control them to the same kind of extent humans can. It could tell us a lot about chimpanzee self awareness, though I don't know how realistic it would really be with current EEG equipment.

That night, Ueda-san cooked dinner for me. He's a really good cook! I also learned about dashi, which is a different flavour from anything we have in the UK as far as I know... he had a hard time explaining it, and when I tasted it I understood why. I love Japanese food!

Monday 5th July

This was another busy day! For the morning session, I attended Kano-san's experiment first. His research is on the detection of changes in pictures by chimpanzees, using an eye tracking device to determine whether the change has been seen. As shown by Professor Matsuzawa's research into memory of numerals, chimpanzees have an eidetic memory, and one exlanation for that is that identifying small changes in the environment could have been an evolutionary advantage. Kano-san explained some of the possibilities for explaining this ability. One is that chimpanzees have a larger fovea than humans, which could mean that the area within which they can focus attention is much larger than in humans. Another possibility is that the processing of visual concepts linguistically slows humans down.

If that was the case, I wondered if chimpanzees would have more trouble identifying the change if symbols which they had been trained to match to concepts (equivalently) were used, for instance, the matching of kanji to patches of colour. This kind of matching is also possible for humans non-auditorally, but I would expect it to be even harder for humans to process changes in visual images like this than images of objects, when they process the images meaningfully. In other words, processing some images audio-linguistically might actually be a benefit, rather than a hinderance. (certainly this is the case for me, when reading kanji compounds I understand the meaning visually, but don't know the reading of, compared to those that I do know the matching auditory information for, [although I guess it's also possible that it's simply a result of switching languages back to English in these cases to process the audio]).

Another possibility is to test people who have been trained to follow changes in non linguistically definable changes to the visual environment (鍛え上げた動体視力方 - sorry, I don't know a corresponding word for this in English), and see if there are any changes in skill level when linguistically processed images are involved. Honestly, I think the fovea explanation is most likely to be the correct one, but it'd be interesting to rule out the linguistic processing hypothesis. But then... if it is simply the fovea explanation, then how is 動体視力 possible?

In the afternoon, I met Professor Matsuzawa for the first time. I felt much more shy around him than any of the other Professors. He is one of the founders of the subject academically, and his work has had a huge impact on how the subject is studied today. So it felt the same as it would have if I had met Jane Goodall!!
Anyway, it certainly isn't the way he comes across that made me feel shy... he is extremely kind,

and has the calm, deep eyes of someone who has become a truly wise person.
The session that afternoon was with Pan and Pal training on the number tasks. They're now learning numbers over 10! Well... Pal was anyway, Pan wasn't very happy that afternoon, and displayed before laying down on a bench, and refusing to participate, even when she was offered some vitamins (even I wanted to eat them, they smelled delicious!). I guess the combination of the summer heat and new faces in the room was too much that day.

As Pal performed the number tasks, Professor Matsuzawa explained to the visitors the difference between human and chimpanzee understanding of visual symbols. If a human matches a symbol to a picture, when presented with the same picture, we automatically infer that it should be matched to the same symbol as it was matched to before - we automatically infer the equivalence of the two. But for chimpanzees, this doesn't seem to be the case. They start off matching A to B, A to B, A to B. Now they're presented with B. What should it be matched to? Well, to them, it can't be A, so it must be C instead!

It made me wonder what it is for a chimpanzee to grasp a concept. Would they be able to learn to distinguish the concept of equivalence and apply it in new situations? (For example, by using a three stage matching to sample test, picture A, then "=" then the correct answer B, picture B, then symbol "=" then the correct answer A. And picture A, then the symbol "→", then B, and picture B, then symbol "→" then the correct answer would be C.)

I also wondered whether training for the B → A was easier to learn than the original A → B matching. If it is, then maybe being a chimpanzee is actually quite similar to being an adult second language learner who learns in this kind of way. The way i've learnt Japanese is actually quite similar, using a flashcard program to memorise the A → B relation. But when presented with B, even though I know it is equivalent to A, the relation B → A must still be trained on it's own (although it is much quicker). For example, if I memorise that the word 車 matches to either a picture of a car, or the English word "car", even though I understand what 車 means upon seeing it, if I am presented with the word "car" in English, or the same picture, I can't necessarily immediately produce the word 車, it takes more training to be able to do it.

In the evening, an American lawyer, Steven Wise, presented a talk in which he explained his ideas about getting legal rights for chimpanzees. The talk was interesting, and perhaps if I was a lawyer, i'd be able to understand more about the reasons for wanting animals to have legal rights, but with a background as a philosopher, I find the idea to be fairly groundless and unjustified. To me, it seems fairly arbitrary to draw the line at a certain level of consciousness. An animal doesn't need to pass the mirror test to feel pain or suffering, for example. Similarly, passing such a test can't provide a really solid justification for giving animals full autonomy, I think. It seems to me that animal welfare and environment enrichment – for all animals, not just those with higher level cognitive skills, should be the most important thing to achieve.

Professor Adachi put it succinctly by saying that each animal should ideally be kept according to their own natural behaviours and abilities. I think this is a really good way of putting it. Of course, different animals with different cognitive skills need different types and levels of enrichment activities. But as long as we pay attention to that animal's own level, and it's own potential and needs, we can prevent them suffering.

Despite not intellectually agreeing with Steven Wise, he's spending time working towards something that may improve the lives of some animals, so good luck to him.

Tuesday 6th July

In the morning, I attended the number learning session again, although Professor Matsuzawa was busy and couldn't attend this time. This time, it was Ai and Ayumu's turn to practise the numbers over 10. They really are amazing to watch doing this!

As I watched and listened, I thought back to a conversation I had the day before with Professor Adachi about the reasons for chimpanzee's mistakes in computer tasks. One of the reasons chimpanzees make mistakes is to deliberately check that the correct answer is the correct answer, and the only correct answer. This is pretty intelligent, isn't it?! We also learn a lot by making mistakes too, I think. It solidifies the A and not B relation in our minds. But another time that a chimpanzee seems to make mistakes is right after another chimpanzee makes one! It did seem like Ai and Ayumu made far more mistakes in quick succession to each other than they did apart. Even the speed of their answers seemed correlated. I wondered why this was – did the sound of the other's incorrect answer disturb their concentration? Or is it the same kind of contagion that occurs with yawning, or emotional stimuli?

I had seen the day before how Pendesa reacted when hearing another chimpanzee's display noise from far away from the room she was in. She became worked up, and displayed too. This happened two or three times in the same session (it's amazing, the agitation is clear as she starts to display, but at the end, it has totally evaporated, and she immediately goes back to the computer task without any apparent residual feeling at all). I wonder what mechanism this kind of contagion occurs by? It's clear that it's extremely valuable socially, but I wonder how strong it is in humans? I mean, it's clear that it's very strong in things like empathy, but I wonder if sometimes we undervalue how strong the effect is in other situations. We generally like to think that we have a large amount of control - maybe not over our emotions as a whole, but at least that they are our own, personal, individual reactions to events. Perhaps this is much less often the case than we assume.

As the session continued, the steady, quick beeps of Ai and Ayumu's answers, along with the heat started to make my brain feel sluggish and sleepy. Perhaps this is how Pan feels in this kind of weather...

In the afternoon, I attended Professor Tomonaga's session again. This time we talked about the research they were doing in association with the aquarium on dolphin cognition. The tasks were really easy for the chimpanzees, since it it's just matching one shape to another. But the idea is to compare cognitive abilities between dolphins and chimpanzees on these kinds of tasks. While research into chimpanzee cognition has been going on for decades now, dolphin research is much newer, and hasn't got as far because of course, dolphins can't touch computer screens. So the research has to be done in real world situations. Anyway, the research should be interesting – dolphins don't have the same kind of binocular vision we and chimpanzees do, and perhaps have adaptations to their eyes to be able to see better in water, which could cause differences in perceptual abilities above land.

We also talked about another piece of research Professor Tomonaga is doing. Earlier in the week, the chimpanzees were selecting a red picture they had seen in a super-fast array. Now there were two colours, green and red. Visual search is actually quite a complex mechanism, isn't it? It involves top-down attention to a rule in circumstances like this, and defining the search parameters. Like, in the first case, it's searching for “red”, and matching “shape”. When the green is suddenly thrown in, now you have to search for “red OR green”. I wonder how complex the rules can be before we, and chimpanzees fail?

That evening there was a lecture given by one of the researchers about the work they had done on

the number training with the chimpanzees. The researcher had been studying what effects ovulation has on adult female chimpanzees with regards to reaction times, and correct answers. It turns out that there is a correlation between ovulation and performance, so that's quite interesting. Even more interesting is what they want to find out next, which is why the chimpanzees trained on number tasks at a young age have better performance than humans, but the adult chimpanzees don't seem to have the same kind of eidetic memory that the young chimpanzees show (they only perform as well as humans on these tasks at best).

It seems that there may be a critical period for chimpanzees to develop this kind of memory. But then the question is... why? Do all chimpanzees in the wild have eidetic memory? And if so, what about the environment trains this ability while chimpanzees are young? If this ability is learnt rather than simply the product of a physiological difference, does it play some kind of social role in the wild? This is very much connected to the things Kano-san was telling me about before. At any rate, it seems like the answer to why chimpanzees have eidetic memory can't be as simple as just having a larger fovea than humans, although it may play a significant factor.

After the lecture, there was a journal reading club, in which a paper about research into the effects of enrichment was presented by Yumi Yamanashi. It was quite difficult to follow in Japanese, but really interesting! It can be hard to measure the effects of enrichment activities in an objective way, but this paper presented a way to meaningfully measure behaviours using fractal analysis. It's pretty maths intensive, but basically, it allows the researcher to measure the randomness of behaviours over different times to find correlations.

Afterwards, Kano-san invited me out for curry with a group of other people from the research institute. It was nice to meet everyone!

Wednesday 7th March

This time, Lira and I attended Chris Martin's session in the morning. He is doing research using game theory to find out what kind of strategies chimpanzees use against each other when playing long term games for food rewards. It's exciting to watch! In this session, Ai and Ayumu were playing against each other. If Ai won, she would win either one piece of apple or three pieces of apple, depending on whether she pressed the right or left button. Ayumu would win two pieces of apple no matter how he won.

Of course, since three pieces of apple is a better reward than one piece, Ai wanted to win those. But if she presses the button that gives her three pieces every time, Ayumu easily works out the right strategy to win. So, in order to win the most pieces of apple, she has to vary her responses to trick Ayumu into thinking that she's going for one piece more often.

You could see the changes in strategy going on throughout the session. First Ai worked out that she would get three pieces of apple if she pressed one button, and then there was a period when she won a lot before Ayumu realised she was pressing the same button every time. Once Ayumu had cottoned on, it was a while before she realised that simply pressing that button wasn't going to work any more, but she eventually switched. By the end of the session, her responses were much more varied.

In the end, although Ayumu had out-levelled Ai on the thinking, and won more times overall, Ai had won the most amount of fruit. Since this was the first time they had played this particular game against each other, it should be really interesting to find out how their strategies will change against each other over the longer term. I think Ayumu will probably win...

Then, Professor Tomonaga and Professor Adachi went down with me to speak to Professor Matsuzawa. I felt quite shy again, and when Professor Matsuzawa asked me why I was interested in chimpanzee perception, I said “because it's really interesting!!”. I really need to work on my interview skills...
But Professor Matsuzawa just laughed kindly, and said, “Why do you climb Mount Everest? Because it's there!” I can't think of anyone i've ever met who would make such a generous response! But its really true for everyone, isn't it? There are many beautiful and interesting things in the world, why should any of us choose to learn about one rather than another? I don't know if any list of reasons can really give the answer... usually it's just that something about it feels right.

We talked about the technological developments that are going to happen in PRI in the near future. It's really exciting! So much interesting research is going to be possible with the new equipment!! And then, Professor Matsuzawa asked a few questions, then said I could come and study there. Wait... he said I could come to study there?!?! Honestly, this took until the next morning to truly sink in!!! When it finally did, I hopped around the room a bit, and couldn't stop smiling!! I don't think I even thanked Professor Matsuzawa properly at the time. I'm sorry!! if you read this, thankyou so much!!!

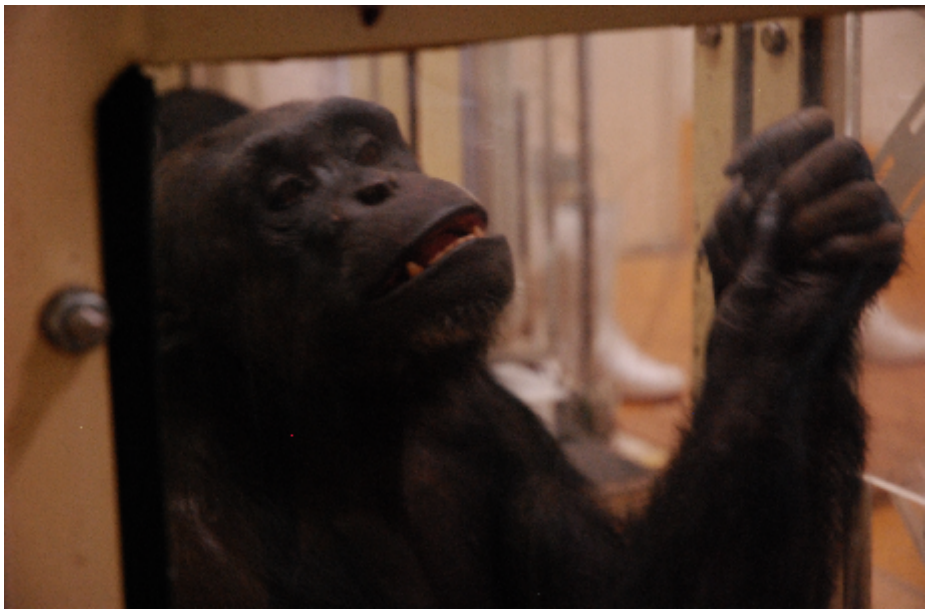
In the afternoon, Yumi Yamanashi took me over to see the Research Resource Station, which is a short drive away from the main building. It's part of the institute set up to study Japanese Macaque behaviour in a more natural setting, and breed Macaques for sending to other research places in Japan. The amount of care and attention that has gone into designing this research station is amazing, and the girl who showed me round was wonderful! (she can even call to the macaques with their own sound, and they respond to her!)

The place is massive, and mostly comprised of large areas of woodland available for the macaques to live and play in. There are ponds for them to swim in, and a special area designed for when they need to catch some macaques for any reason, using microchip gates. Everything has been so well designed, and is totally environmentally friendly. All the sewage recycling is done on site, and there is a rainwater reservoir. Even the breeding houses are brilliant, with play structures built from used aeroplane tyres, and other recycled materials. It's sad to think about the types of environment these macaques might end up in, but it'd be hard to beat this kind of luxury natural environment for the time they spend here!

Thursday 8th March

In Professor Tomonaga's morning session, we talked about the differences in the behaviour of the chimpanzees at PRI and chimpanzees in the wild. When chimpanzees work closely with humans, they tend to learn to use different forms of gesture and body language to express what they want in a clearer way to humans. In some cases, it may have been explicitly taught, for example, when a chimpanzee has been raised by humans from birth. Other behaviours might have been transmitted just through watching human behaviour, such as pointing.

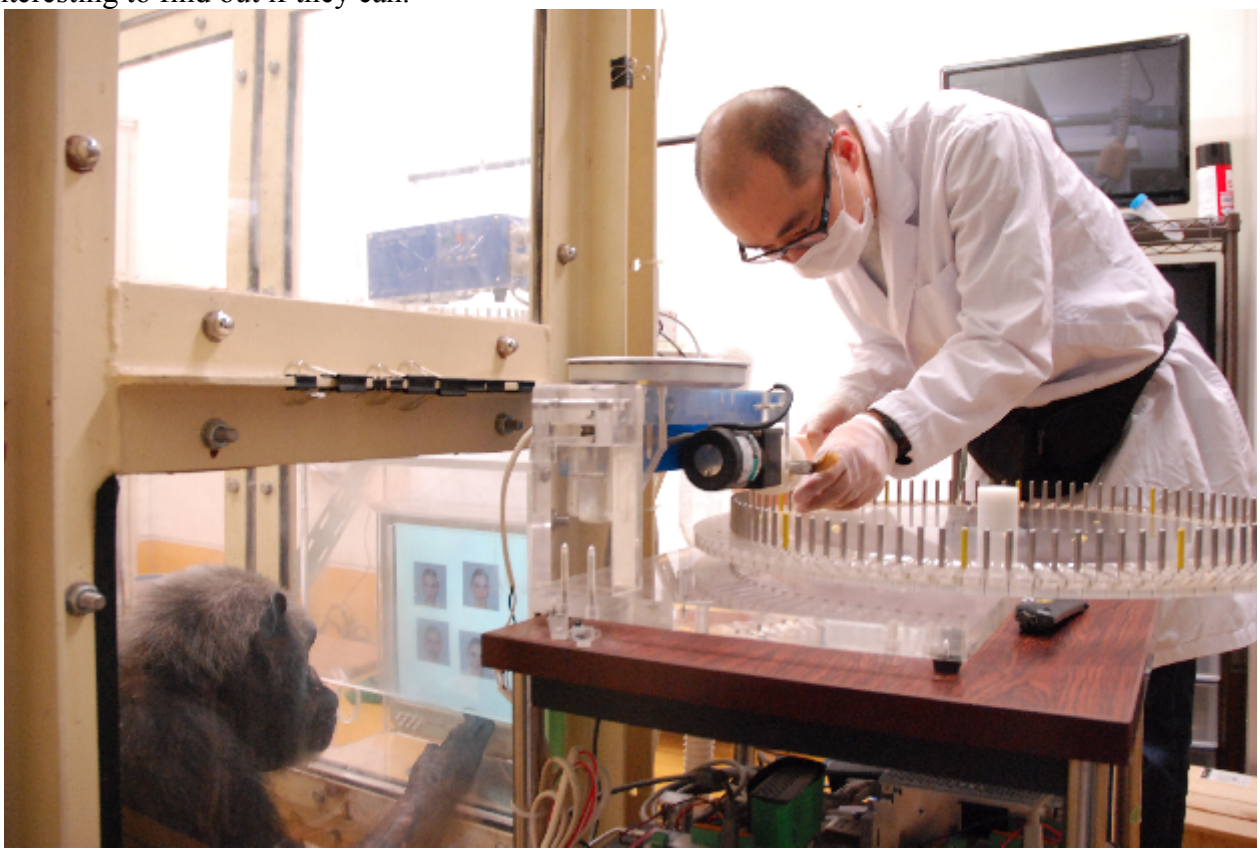
Still others seem to be adaptations of behaviours found naturally for new purposes. One of these is clapping. In the wild, chimpanzees bang on trees, or sometimes clap as a display, but in the experiments Pan uses this behaviour to express impatience to the person running the experiment. Between tests, the visual basic display has to be reset for the next test, and this can take 10 seconds or so. Chimpanzees are extremely impatient!! They don't even like to wait in experiments like Professor Adachi's, where there is only a few seconds delay before they can respond.



(Pan) *Oi!! What are we waiting for!?! Neeeeext.....*

Different chimpanzees have different ways of expressing their impatience to people. Chloe does a sort of raspberry sound with her lips instead of clapping. Because she was originally raised by humans in a zoo in Paris, it isn't known if she was explicitly taught this behaviour or whether she just found that it worked. But more interesting is that Ayumu has picked it up and uses it in the same way. Since Ayumu and Chloe aren't in the experiments together (it's always mother & daughter / son pairs), or even in the same group outside as Ayumu, it's interesting to ask how he picked this up.

Now, Professor Tomonaga is investigating whether chimpanzees can learn to take gaze cues from humans when the head isn't facing in the same direction as the gaze. It's quite a subtle cue, so it'll be interesting to find out if they can.



Chloe doing the eye gaze test while Professor Tomonaga refills the universal feeder

It really makes me wonder, what are the necessary and sufficient conditions for transfer and understanding of behaviour between species in the wild? Of course, in the wild, there isn't the same need to communicate between humans and chimpanzees. But I wonder if behaviours are ever transferred or picked up when the two species live in close environments for many years? Either from the local people, or the researchers. Examples such as the "log doll" being used by both the local children and the chimpanzees make you think a bit. And there must be other chimpanzees with personalities like Ai's, who seems to enjoy observing humans just as much as humans like observing her. Perhaps Lira's research can help with this.

Then Kaneko-san talked to me about another experiment he's planning to do, this time with humans. The idea is to use experiments on sensory attenuation to find evidence for or against elements of free will. Can you imagine?! A scientific experiment to test free will! Amazing!!

I had a free afternoon that day, so I went for a bike ride around some parts of Inuyama I hadn't been to yet. When I got back, Makiko Uchikoshi came and offered to take me to see the gibbons. I was excited to finally meet the owners of the beautiful voices i'd heard!

I wasn't disappointed. The gibbons look as beautiful as they sound. Although two of them seemed a little disturbed by my presence, the other one just gazed at me with soft, curious eyes. He has creamy white fur that is in perfect condition, and he uses a mirror to view other parts of the room. You can tell how much Makiko Uchikoshi loves these gibbons – the two younger ones she hand reared herself because their mother was abusive towards them. When they were younger, she could take them out to play in the trees, but now they are too old.

When I got back to the office, I started researching papers on gibbons, and I was surprised to find out how little has ever been studied about gibbon cognition. Gibbons are really quite endangered, and the link between the apes and the monkeys, but they are overlooked fairly often in research, it seems. Its quite strange, because they seem to have adaptations that could act as a model for human evolution, as well as adaptations that are very interesting in their own right. I would really like to do some cognitive research with them, if it's possible! I hope one day they can have a nicely designed space outside, like the chimpanzees and macaques, too.

Friday 9th July

My last day :(
I attended Professor Tomonaga's morning session for the last time. This time we talked about Chloe's process of learning for Kaneko-san's attention vs. consciousness experiment. It's only in the matching stage at the moment, and the chimpanzees are learning to match three shapes to positions on the screen, top, left, and right. Chloe seemed to know one of them very well, one of them she'd get right some of the time, and one of them she seemed convinced was in the wrong position, and always got wrong. But Professor Tomonaga and Kaneko-san told me that it had changed since the last session! Last session, she got a different one right most of the time, and confused the other two. So, it seems that when Chloe learns something, somehow focusing attention on one piece of information disrupts the knowledge of other pieces of information. Perhaps this keeps going round and round in circles, while the baseline performance for each increases gradually.

I thought again about human's ability to just simply grasp a concept, and how useful this really is. We can find something incredibly difficult and just not understand it for quite a while, but eventually, that sudden spark – the moment of understanding occurs, and everything becomes clear. We think, "Ohhhh, of course!! How could I have missed that!?" Certainly in this type of setting, that moment of clarity doesn't seem to occur in the same way for chimpanzees. The process of learning is always gradual.

But when you consider some of chimpanzees natural abilities, this is also quite strange. Even with far more complex physical tasks, chimpanzees do seem to display this kind of grasping of a solution, and they even do it far more logically and easily than humans do in some cases. So, why not on similar tasks on a computer screen? Is it just the symbolic nature of the activity? Or is it the lack of physical-ness? Perhaps the token use research has the answer...

I took some final pictures (It's so hard to take pictures in the experiment rooms with all the reflections!). It's interesting to see how the different chimpanzees react to having pictures taken. Just like humans, some of them seem to love it, and even seem to pose for the camera! (Chloe! And Pan doesn't seem to mind either...) Others, like Pal, don't seem to like it much and get upset. I wonder then, what being looked at through a camera is like for a chimpanzee. For a human, being aware of a camera is the interaction between being aware of being looked at, and being self aware – we are aware of ourselves being looked at. In the simple gaze sense, if someone were to follow all our movements through a camera lens, we would feel equally (if not more) uncomfortable than if we were just being stared at. Do chimpanzees feel the camera lens as an extension of the human eye in the same way?

After lunch, it was time to leave. It felt like such a quick week, I wish I could have been there longer! But then Professor Tomonaga gave me a stack of books filled with research from the department, both field and cognitive studies!! I was so excited that I wished I was going home immediately so I could start reading them!!! I went to see Professor Matsuzawa for the last time. He said I could come to the Yoshida-Izumidono Cosmos Seminar on Sunday in Kyoto! So, it wasn't quite the end yet...
He also gave me a DVD lecture of his that's in Japanese, and the DVD of Ayumu performing the number memory tasks!!! It's a lot harder to find lectures in Japanese online than it is in English, so it's great to have something to practise with! And I love Professor Matsuzawa's lectures; he has an amazing ability to turn complex evidence into simple to grasp, yet deep ideas that always show a new frame to view things with, or a new way of thinking about something. I hope more of his public lectures are recorded and put online or on television in the future!

Sunday 11th July

This was really the last day. I was excited to attend my first seminar – in Japanese!

Unfortunately, I can be a bit scatterbrained at times, and had forgotten to book a hostel in Nagoya for the 2 nights before. When I came to try to book one, they were full up! So, I decided to stay in a Manga Kissa – an internet cafe that lets you stay the whole night if you want, instead of one of the more expensive hotels. It's cool to be able to read all the manga you want, and watch Japanese television and use the internet... I had chance to watch Professor Matsuzawa's DVDs a few times! But, it turns out that they don't substitute too well for hotels. I managed to grab a couple of hours

sleep on the bus on the way from Nagoya, but I wish I had got a bit more!
I also got lost in the rain trying to find my way to Kyoto University, and an extremely kind man helped me find my way, and insisted on giving me his umbrella. Throughout the whole time I was in Japan, people were incredibly kind and generous to me! I hope British people are equally generous to Japanese people when they visit here, but somehow I doubt that they are – Japanese culture seems include kindness and hospitality to visitors to such an amazing extent.

The place the seminar was held in was really beautiful. It was a real, old style Japanese building, with the sliding doors, and low conference tables, with a Japanese style garden outside. I had forgotten to bring socks! But it was really amazing to be in a place like that. One thing that surprised me was that the floor beneath the low tables had holes in! So it's just like sitting at a normal table, but lower. I never realised they were like that before.

Because I got lost, I arrived a bit late. The first part was for some of the students to present their research before the professors arrived. I was sad that i'd missed Lira's talk; after all the training i'd seen, i'd have really liked to see the concept of the whole thing presented. But, I did catch the end of a talk about plants, and an interesting talk about the differences between what things taste like to chimpanzees and humans. I guess we'll never really know what some flavours taste like to chimpanzees, because it turns out they have some different receptors. Olfactory genes are really fast changing, and one of the biggest differences between human and chimpanzee DNA, so it's definitely interesting to learn about.

Then the Professors arrived, and everyone introduced themselves to the room in turn. I was so nervous – although i've spent quite a lot of time listening to Japanese, I had barely spoken any at all. So to do it for the first time in front of a room full of people was difficult! I managed to say something, though I'm pretty sure it wasn't grammatically correct, and I think I even forgot to say よろしくお願いします at the end...

After that the real lectures started. The first two were unbelievably hard - I couldn't even work out what they were about from the pictures on the slides, let alone the Japanese! Ah well... maybe I wouldn't have understood them even if they had been in English.

Then Professor Adachi gave a lecture on the synaesthesia research, which was really fun to listen to! We'd talked about it previously, but then it was in English. Actually, it's quite strange how much understanding the concept of what someone is talking about allows you to understand more of the language itself, I think. Even if you use the same level of language and types of sentences in both, I think you'd recognise the language you understand far more easily in the one with the overall concept you understand.

After a break, it continued with a discussion about a conference that's going to be hosted in Japan next year. It's the international conference on consciousness! So, it's really quite exciting. It's a really well known conference, and lots of distinguished professors from around the world will be presenting there. Professor Matsuzawa will be holding it. I wish I could attend!!

Next was a presentation of work done on attaining natural looking movement and responses from a robot. The aim was to get it to move and respond like a real baby would, but that's actually pretty difficult. Real babies make a lot of random actions, and their arms and legs and bodies move in strange and unsynchronised ways. They mapped points of babies bodies moving to try to mimic it. Although the resulting robot's actions still didn't look entirely human, it was still quite impressive – the movements looked quite fluid, and it could respond to sound or vibrations as well.

The final talk was by Dr. Hirata, who works at GARI, which is part of PRI that's not in Inuyama. I

really enjoyed his talk! It was about the studies he's done into co-operation behaviour in chimpanzees. Older research into chimpanzee co-operation found that these skills were lacking, but new methodologies that he's been using show that in certain circumstances, chimpanzees willingly co-operate. I really like the methods he's used, and the presentation was good fun to watch. I was sorry that he didn't have time to finish, as there were more studies with new research still to come.

Afterwards, there was food and drinks, and I got to know some more of the other students there, which was really good!

Overall, the day was much harder than I had anticipated. I never realised before that listening to another language for so long was so tiring! I made silly mistakes, should have slept more, and didn't understand as much as I would have liked. But, i'm really glad I had the opportunity to go!! I will work really hard, and learn a lot more Japanese terminology, so if I have another opportunity to attend something like that I will definitely understand a lot more!

Acknowledgements

I don't think it's even possible to say thankyou enough times for inviting me to PRI, the time I spent there, everything i've learnt, and the kindness and friendliness everyone showed towards me. The time I spent there has become one of my favourite weeks of my life so far, so I have a lot to say thankyou for!!!

To Professor Matsuzawa, thankyou so so so much for saying I can come and study at PRI!!! It makes me indescribably happy!!! Thankyou for being such an inspirational figure in the field of primatology; to me, and to so many other people around the world. It's been a real honour to meet you!!! Also, thankyou for the DVD lecture, I think I will know it off by heart by next year :) And for the DVD of Ayumu's brilliance, it's given me the chance to show it to my parents and grandparents. They're very impressed!

Professor Tomonaga, thankyou for inviting me to come to visit PRI, and giving me the opportunity to see first hand how the institute works and meet so many interesting and clever people! Also, thankyou for giving me the nicest interview i've ever had!!! And for letting me attend so many of your sessions and the ton of things we talked about in them. I learned so much from you in such a short time! Your enthusiasm, quickness, and sense of humour are definitely contagious!! Thankyou as well for the heaps of collected papers from the institute, i'm loving reading them! Finally, thankyou for giving me the chance to come to Japan for the first time, under the nicest circumstances possible!!!

Professor Adachi, thankyou for half a million interesting conversations!!! You have a real talent for making people feel comfortable around you! I think with your open, genuinely friendly, and generally cool nature, along with your balanced, insightful views, and never-endingly interesting stuff to talk about, you will do great things!! Despite the fact that you're so busy, you always made time for me, and I really appreciate that too!! Thankyou for the birthday cake, it was totally delicious! And for the books, it's great to be able to read about primatology in Japanese. And finally... thankyou so much for answering my original emails!!! I'm still trying to think of a good way to test olfactory cross-modal matching...

Lira, thankyou for looking out for me while I was at PRI, and going out of your way to help me with everything. Thankyou for inviting everyone out for my birthday!! I had a great day!!! I tried both, & I definitely think you're right, Yoshinoya is better than Sukiya :) And thankyou for taking me food shopping, telling me about everything, and being a friend!! I hope we can have lots of fun

together in future too!!!

Ueda-san, thanks for dinner and all the onigiri! And for introducing me to Japanese cooking, I hope I can learn more from you soon! And thanks for being so friendly and speaking to me so much, I know how hard it is to have conversations in a foreign language. goodluckgoodluckgoodluck with the exams in August!!! お互い頑張って同じ年生にしようね：）

Chris Martin, thanks for letting me see your experiment, and teaching me more about game theory. Your research is great, I'm really interested to hear about what'll happen with the new setup, and as the game progresses in general!! Thanks as well for the break time conversations, for teaching me about fractals, and for telling me where's good to go out!! Maybe next year you can show me them :)

Kano-san, thanks for making me laugh so hard on my birthday, and for the fan!! And also for inviting me out for the curry, I had a great time. Thankyou as well for showing me your experiment, and explaining your ideas about the fovea and other things related, the stuff you told me about is next on my reading list! It brings up lots of other interesting questions too, I think. Oh, and thanks for explaining how those jumping beans work!!! Finally, I don't need to be scared of them anymore!! ;)

Kaneko-san, thankyou for teaching me how philosophy can be turned into science! It's truly inspiring to see how easily you come up with research methods and ideas for such difficult problems. It's the first time in years that i've been excited to think and talk about that kind of subject again, so thankyou!!!

Yumi Yamanashi, thankyou for the fun time at the Indian, introducing fractals to me, and for taking me over to see the research resource station!! And for helping teach me the Japanese word for “sewage”;) Thankyou as well for the conversations about environment enrichment, and the recommendation of the book! I'm sorry I left before I got your email, but I'll definitely read that chapter somehow!!

Makiko Uchikoshi, thankyou so much for introducing me to the beautiful gibbons!!! At PRI was the first time i've ever heard gibbon song, or seen a gibbon in real life, it was such an amazing experience!! I really hope we can work together on some papers on gibbon cognition & perception soon!!

To the people who make lunch at the institute, ごちそうさまでした！とてもおいしかったです！

To everyone else that I met, thankyou as well!!! I hope we can talk more in future!!!

Finally, thankyou to Ai, Ayumu, Pan, Pal, Chloe, Cleo, and Pendesa for letting me join their experiments... お邪魔しました。Thankyou for being amazing, and being yourselves. Thankyou also to all of the chimpanzees for never spitting on me (yet)!!! To Pal, i'm sorry for upsetting you with the camera, and Pan... i'm sorry for upsetting you in general. I'm glad you got used to me in the end!! Also, Akira, sorry for disturbing you in the corridor, i'm not that bad, honest!!!
Thankyou to the gibbons for being beautiful, I hope I get to know you better! The marmosets for being cute, the capuchins for... um, hissing at me..? I guess i'm not so popular with capuchins. And thanks to the Japanese Macaques for giving some nice shots, and all the other species of primates I had the opportunity to meet at PRI!! They are all brilliant!!!

これからもよろしくお願いします：-）