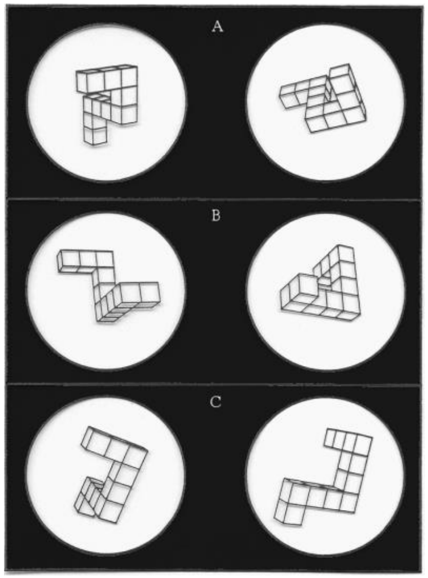
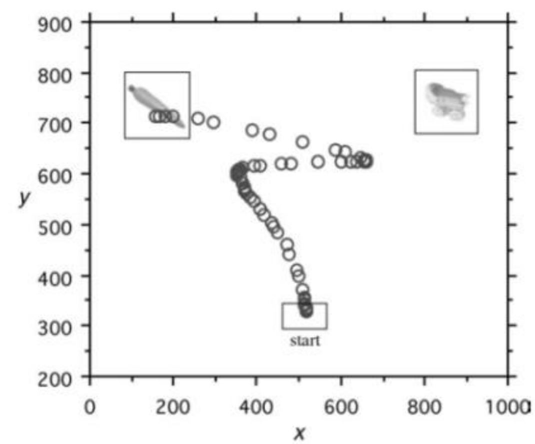
LECTURE 1 – KEY STUDIES AND THEORIES

WHO	AIM	WHAT WAS DONE?	FINDINGS
Shepard & Metzler (1971) 	The hypothesis was that the task would be done by forming a three-dimensional mental image of one of the depicted objects, and rotating this whole image, in the imagination, to see whether it could be brought into correspondence with the other picture.	Presented their subjects with pairs of drawings of three-dimensional, asymmetrical assemblages of cubes, as shown in the figure on the slide. In each pair, the right-hand picture either showed an assemblage identical to that shown on the left, but rotated from the original position by a certain amount (figures A and B), or else it showed an assemblage that was not only rotated, but was also the mirror image of the one to the left (figure C). The experimental task was to indicate, as quickly as possible (by pressing a button), whether the two objects depicted were in fact identical (except for rotation), or were mirror images.	The experimental results (displayed on the right of the slide) clearly supported this idea, because it was found that the time taken to confirm that both objects of a pair were identical increased in direct proportion to the angular rotational difference between them. Shepard and Metzler's data provide compelling evidence that at least some of our cognitive processes are carried out using representations that are based on images that are analogous to the thing they represent, and that we literally manipulate these images in our minds in a manner analogous to the way in which we might physically manipulate a real object.

Spivey & Dale (2006)	Real-time cognition is best described not as a sequence of logical operations performed on discrete symbols but as a continuously changing pattern of neuronal activity. It is possible to see that mental activity is also being conducted in between those seemingly discrete thoughts	Used real-time mouse-tracking to demonstrate categorical decision-making (identification) unfolding “dynamically” (i.e., over time) and inseparably from the perceptual and motor processes that accompanied it – sensing, thinking and acting in a perceptual-cognitive cycle.  **Figure 3.9.** Mouse-movement trajectory (in pixels) for “Click the carrot,” with a carriage as the cohort competitor.	The image shows the trajectory of the participants responses as they moved the mouse towards the target image “carrot” in the context of a phonologically similar competitor “carriage” provided as a distracter. As the sound of the target item unfolded over time (“c_a – rr_o_t”), the participant’s response shows a diversion towards carriage before settling on a beeline for carrot. Thus, we argue that cognition is best analysed as a continuous dynamic biological process, not as a staccato series of abstract computer-like symbols”

LECTURE 2 – KEY STUDIES AND THEORIES

WHO	AIM	WHAT WAS DONE?	FINDINGS
Seyfarth et al (1980) – **monkey responses to three different**	Was to determine if Vervet Monkeys used vocal	Reported that Vervet monkeys make three distinct calls to alert	Found three distinct calls: - Eagle

alarm calls: evidence of predator classification and semantic communication	communication calls in much the same way as human use words to communicate.	fellow troop member to the presence of specific predators in the environment. Each call was acoustically distinct, and each results in a distinct (i.e. predator specific) behavioural response. Played recordings of alarm calls from a speaker in the bushes and watched the troops respond differently to each.	- Snake - Leopard Been debated very much whether alarm calls we see in monkeys or other species display the same thing as words. Are they symbolic or merely indexical?
Savage-Rumbaugh – **Sherman and Austin**	Primary goal = elucidate the processes of language acquisition in apes and compare them with the phenomenon of spontaneous language acquisition in human children. - Most insightful examples of the difficulties associated in moving from learning operant conditioned stimulus-response associations (indexical learning) to symbolic associations (symbolic learning) The process by which Sue S-R established symbolic reference in her chimps, Sherman and Austin, highlights the difficulties, and in the process sheds light on the processes underlying symbolic learning.	The chimps were trained to use a computer keyboard made up of **lexigrams** (provides a record of the process that leads from indexical to symbolic reference) - Contain abstract symbols that aren't iconic in any way - E.g. + = peach - Shuffled order they were presented on the screen so chimps couldn't learn position - Learnt to distinguish the different symbols for the meanings Studied two young mail chimpanzees: Sherman and Austin Focused on: comprehension (receptive language) rather than on production and symbolic reference rather than syntax. Established symbolic reference first through receptive language	The work with Sherman and Austin demonstrated the following: (a) apes can comprehend symbols, but production does not lead spontaneously to comprehension; (b) in order to function "representationally", the symbols learned by apes must become decontextualized and freed for use in novel situations; (c) apes can use symbols to communicate with each other if they develop skills of joint attention and if their environment places a premium on cooperation; (d) apes can make informative statements regarding their intended future actions; and (e) referential comprehension and usage are prerequisites to the production of syntax.

		comprehension rather than production.	
		Teaching the names of objects by association - The trainer holds up an object (banana) and then encourages or assist the chimp to select the correct lexigram - Reward for correct response	The trainer’s assumption was that the banana held up was the ‘stimulus’ and the selection of the lexigram was the ‘response’. However it became clear that from the chimp’s point of view pressing the lexigram was the ‘stimulus’ for the trainers to produce a food reward as a response
		Changed the symbol-object pairings came easily once the task was changed to a “Request task” Show the banana, select correct lexigram for banana, receive banana	Chimps became confused once the expectancy of receiving the object was removed. However, knowing how to use the symbol ‘banana’ to get one, is not the same as knowing that the symbols represents banana.
		Had to separate the names of things from the contingencies associated with the learning of those name – used the “fading” technique Decreased the size of the requested food given on each successful trial while providing with another reward as well Gradually de-coupled the name from the presence of the object Could refer to the object correctly without expecting to receive it	Generalised learning to learning names of new objects in a single trial. They had to distinguish between merely requesting things and actually naming them The fading technique achieved this.
			Took a number of trials for them to realise that the informer had to

		Wanted to teach Sherman and Austin to communicate symbolically with each other about an object that was not visible. Used a hiding task to create a motivating communicative situation for the chimps - Sue would enter the room with a food item hidden inside a container - Then she would press the lexigram on the computer to match the hidden food - The chimps needed to press the same lexigram to receive the food Extended to the chimps telling each other what was in the container.	pay attention to the responder's response if they were both going to receive the food. Note the importance placed on the chimp representing the knowledge state of the other chimp – the basis of Theory of Mind.