

**9.00 Introduction to Psychology
Spirited Away by the Midterm
17 October 2002
190 total points**

If you think animated feature films begin and end with Disney, you should see some of the work of Hayao Miyazaki. He has produced a series of entertaining and evocative movies. The latest is entitled “Spirited Away” and I decided to use it as the basis for the midterm. PLEASE NOTE: I am using the film for its story but you don't need to know anything about it in order to do well on this exam. If you think that the story is confusing you, please ask and we will explain the meaning of any question. We are not trying to be tricky. Write your answers on the exam. Use the back of pages if needed (Tell us where to look!). Good luck.

SCORE
p1 _____ of 5
p2 _____ of 20
p3 _____ of 30
p4 _____ of 25
p5 _____ of 25
p6 _____ of 20
p7 _____ of 20
p8 _____ of 30
TOTAL

NOTE: Even though this is fantasy with spirits, witches, etc., assume that the rules for our universe apply unless you are told otherwise. Same brains. Same mental process. Etc.

1) (10 points) At the beginning of the movie, a 10-yr old girl, Chihiro, is in the back seat of the family car. She is sulking because they are moving to a new house and she didn't want to go. She is staring out the left window as they drive through a town. This means that all the buildings appear to be moving from right to left as the car moves forward. When the car stops, she shifts her gaze to look at the buildings out of the right-side window.

Do the buildings appear to move or not? Why? What does this tell us about vision – specifically, about the processing of motion?

2) (5) Her dad (being a dad) decides to take a short-cut. Soon they are racing down a dirt road into denser and denser forest. The car keeps hitting bumps. These scare the girl. When car hits a bump, she squeals. This is reflexive. That is simply the way she sounds when she is scared.

If we are thinking in the language of learning theory, the physical sensation of the bumps would be called.

- a) the distal stimulus b) the operant condition c) the unconditioned stimulus
- d) the conditioned stimulus e) negative reinforcement f) the pits

3) (5) And the squeals would be called

- a) the distal response
- b) the proximal stimulus
- c) the conditioned response
- d) the unconditioned response
- e) operant reinforcement
- f) popular music

4) (10) Along the side of the road are weird little statues. Sometimes they appear just before a bump so you have the sequence: Statue → Bump → squeal. Sometimes the statues appear where there is no bump and sometimes a bump is hit with no statue in sight. It happens that there have been statues before most bumps. However, there is no contingent relationship between statues and bumps. At the end of the road, there is a statue but no bump. Will Chihiro squeal? Please explain your answer. A good answer will use the appropriate terminology from whatever form of learning this might be.

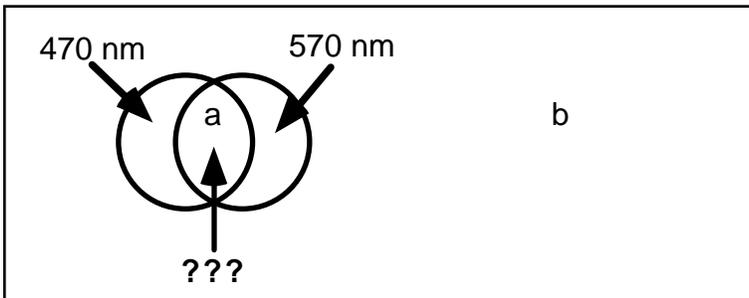
5) (5) Oh yes, the end of the road. The short cut ends abruptly in front a building with narrow tunnel leading through it. The dad decides to explore. Chihiro thinks that this is A Bad Idea but dad's never listen so they walk into the tunnel. It is dim in the tunnel. Chihiro notices that her colorful clothes now appear to be only shades of gray. Why?

- a) Chihiro's cone photoreceptors do not work in dim (scotopic) light levels.
- b) Chihiro's rod photoreceptors are subject to the problem of "univariance" which makes it impossible to tell one wavelength from another except by perceived brightness.
- c) Chihiro has only one type of rod photoreceptor.
- d) The visual system is not trichromatic at scotopic light levels.
- e) All of the above
- f) A & D g) A & C h) There is lots of dust in here.
- i) none of the above

6) (5) Eventually, they emerge into what looks like an abandoned waiting room. It is much brighter here (color vision is back) The windows are tinted. The sun, shining through the windows puts spots of light on the white wall. Conveniently, these are *monochromatic* (single wavelength) patches of light. One patch is a lovely 470 nanometers (nm). It looks blue. Another is 570 nm. It looks yellow. These two patches partially overlap. The mixture of 470 nm and 570 nm light, shining on a white wall will appear to be what color? _____

7) (5) If dad was carrying a spectrophotometer, he could measure the physical wavelength(s) reflected from the wall. He would find that the wavelength composition of the mixture of 470 nm and 570 nm light was _____ (feel free to add a brief explanation if you like).

8) (10) Suppose the Chihiro stares at the pattern on the wall for a while and suppose it looks like this:



She fixates on the “a” for 30 seconds and then shifts her gaze to “b”. What does she see and why? (You can draw on the figure if you like but don’t forget the WHY part).

9) (5) Beyond the waiting room is a green field and across the field is what appears to be an abandoned town....except that there is a really good smell. This makes Chirhiro’s parents curious and hungry. If you were looking for the brain areas involved in this feeling of hunger, you might look in

- a) the hypothalamus
- b) the hippocampus
- c) the adrenal cortex
- d) the third ventricle
- e) any of these could be correct because it is not possible to localize brain areas for hunger.
- f) none of the above

10) (10) There are a lot of closed stores but, eventually, they find a food stall with a really great looking buffet. The parents try to get someone to take their order but no one appears, so they decide to just dig in and eat. Chihiro thinks that this is A Really Bad Idea but parents never listen. Chihiro wanders around. She finds a bridge leading across to a beautiful-looking building but on that bridge, she meets a boy named Haku who tells her to get out before it is too late. In fact, she is in big trouble (She doesn’t know

it yet.) Haku doesn't know her, of course, but he wants to help her. Why? There is no one right answer to this. Just be sure your answer says something about the psychology of motivation.

11) (5) Here is the trouble. While Chihiro has been sulking, the parents pig out. They really pig out. When Chihiro comes back, they have turned into real pigs. This is A Really Big Problem. Mom and Dad now have pig brains. In which of these would you expect to find the biggest difference between a pig brain and a human brain?

- a) Limbic system structures (e.g. hippocampus and amygdala).
- b) Brain stem structures
- c) Neurotransmitters
- d) Myelin
- e) Frontal cortex
- f) The porcine nucleus

12) (10) Naturally enough, Chihiro is really scared. She goes running around yelling for help. There are all sorts of changes going in her nervous system in order to mobilize her body for this "fight" or "flight" challenge. We are interested in just one aspect of nervous system function. What happens to the size of the action potentials traveling down her axons? Please explain briefly.

13) (5) Things get worse. She sees people but they turn out to be spirits. She runs back to find Haku and he tells her that she is trapped. This building is a giant Japanese bathhouse for spirits. It is run by a witch named Yubaba. If she wants to get her parents turned back into humans, Chihiro has to find Yubaba and get Yubaba to give her a job. It takes a while but she finds Yubaba. Yubaba makes her forget her name. This would be a form of

16) (10) Sen still says she wants a job. At that moment a huge pillow comes flying from the next room. “Go take care of the baby,” says Yubaba. Sen looks in the next room and sees the world’s biggest baby. “How old is that baby” asks Sen. “Guess” says Yubaba. Sen sees that the baby is fussing because he wants a rattle that he can see. She hides the rattle. The baby stops fussing. In fact, the baby behaves as if the rattle no longer exists. “Ah” says Sen, “Piaget would say that this baby lacks _____ and must be in the _____ stage. That would make the baby about _____ old.

POSSIBLE ANSWERS include: oral, concrete operations, sensory-motor, syntactic, syntax, object permanence, unconscious inference, subjectivity, objectivity, family values, thalamo-cortical, pre-operational, Gestalt....

You may fill in the blanks with these terms or any others that you can think of.

17) (5) Then the baby says “I slorged a frambus with a gormly toop.” Sen says “I can’t really understand the meaning of what that baby is saying but he sure has a good grasp of

a) semantics b) morphemes c) concrete operations d) syntax e) etiquette

18) (5) Is it plausible that the same baby/child would produce the behaviors in questions 16 and 17 at the same age? Please explain briefly.

19) (15) Sen still says she wants a job. Finally, Yubaba agrees. She tells Sen to go to the supervisor to get a job scrubbing the baths (This is a bathhouse, remember?). Yubaba tells her that her behavior must be **shaped** so that she can work on a **variable ratio schedule of reinforcement** with a high ratio of scrubbing to reinforcement. She says once she is trained in this way, the scrubbing behavior will not **extinguish** rapidly. Make up a story about Sen’s training and her job that makes it clear that you understand the terms **shaped** (or **shaping**), **variable ratio schedule of reinforcement**, and **extinguish**(or **extinction**). If you don’t feel like writing stories, just define the terms – that will be fine.

19) (10) Sen gets sent to the biggest bath. When you have a bath customer, you can get special herbs and spices to for their bath. Sen's trainer warns her to be careful. For example, there is one mixture that can knock out the entire right hemisphere of the brain. The effect is reversible but inconvenient. What would inactivation of the right hemisphere of a typical right-handed individual do to voluntary control of skeletal muscles (like those you would use to move your arms and legs). Feel free to offer a bit of explanation.

20) (10) What would inactivation of the right hemisphere of a typical right-handed individual do to vision. Please explain your answer (maybe draw a picture?)

21) (5) In a typical right-handed individual, inactivation of the right hemisphere would

- a) produce Broca's aphasia
- b) produce Wernicke's aphasia
- c) both of the above
- d) none of the above
- e) c & d

22) (10) Running a bath turns out to be an exercise in problem solving. There are all sorts of rules to keep in mind. If the spirit is a sludge monster, then it is to be avoided. But if the sludge monster is really a river spirit with a pollution problem, then it can be helped...and so on. As you know, people are not good at working these problems out in terms of formal logic (If p, then q...etc). They use short-cuts known as heuristics. Please described two of the heuristics used in human problem solving. You could describe the **availability** or **representativeness** heuristics. You could describe **framing** or the **base rate** problem. If none of that makes sense, try something else. You do not need to use the bathhouse as an example (but that would be clever). ANSWER ON NEXT PAGE

23) (10) In fact, a sludge monster does show up and he is assigned to Sen. Everyone else gathers to watch because this is a very rare and salient event. It is the sort of event that might produce a **flashbulb memory**. The others in the bathhouse talked about the sludge monster for a long time. A year later, you might still hear someone say “I remember exactly where I was when I first saw that thing.” How much faith would you put in the details of this memory report? Please defend your answer with **TWO** pieces of empirical evidence about recall from memory. In addition to flashbulb memory, experiments dealing with **eye witness testimony** and/or **forgetting** might be relevant.

Oh dear...I didn't tell you about No-Face or the Witch's sister or the little things that carry the coal. You will just have to see the movie but this will do for now.