Working together: Group activities

1. The inverted world

Preparation

- Copy and stick together a large donkey or prepare one for projection.
- Make appropriate-sized cardboard tail.
- Acquire goggles or prisms (e.g. from Physics Department) or if unavailable, mirrors.
- Make eye patch (to use with prisms).
- Get hold of Blutac® or drawing pins.
- Make copy of prism explanation available (see Resources).

Introduction

This activity aims to illustrate the problem associated with understanding new visual stimuli. Learning about the perceptual world isn’t just about assigning labels to objects and events that have been seen, it’s also about knowing what visual information means. How do we ‘know’ that smaller things might be further away or that more distant objects appear to move more slowly against the background when we move? These cues to depth (of relative size and motion parallax) are the kinds of information available to infants on the visual cliff, but do they have to learn to understand what this sensory data is telling them? The use of inverting goggles gives researchers (and, in this instance, students) the opportunity to see the brain in action as it interprets an unfamiliar visual experience.

There have been several studies investigating the capacity of animals and humans to learn to cope with an inverted visual world. Stratton (1897) describes the experience of wearing inverting goggles for three weeks. Initially the whole world appeared to be upside down. It slowly righted itself over time (some things more quickly than others), with many objects righting themselves when touched. Eventually, Stratton was able to revert to cycling to work. When he removed the goggles, the world appeared once more inverted and he had to work through the inversion all over again. More recent evidence, however, suggests that inversion is imperfect, that the visual world remains unstable and that feedback from the environment, e.g. through interacting with objects, is important in the adaptation (e.g. Kohler, 1962; Klein et al., 2006).

Note that there’s always at least one student who wants to know how the prism inverts the image, or why (in some prisms) it is also reversed left to right. Essentially it’s because the image goes through one or more ‘total internal reflections’, that is, gets reflected off the inner surface(s) of the prism before emerging the other side for the viewer to see. If this happens only once, it is not reversed so, just like a mirror, the image appears back-to-front too (see Figure 8.2 for an explanatory diagram).
Risk assessment

- If using prisms, use plastic ones in preference to glass to avoid the risk of broken glass.
- Whether plastic or glass prisms are used, be aware of the risk of eye damage if students are in direct sunlight. Ensure appropriate warnings are given and precautions taken.

Tasks

Depending on the availability of equipment, this task can be performed either with inverting goggles or very simply with the participant wearing a patch over one eye and holding a prism up to the other. It is likely that you will be able to loan prisms from your Physics Department. If prisms cannot be obtained, a similar effect can be obtained by holding a mirror above the eyes and looking upwards into it.

Task A

One participant, looking through the prism(s) tries to pin the tail on the donkey.

Task B

Another participant, also looking through the prism(s), must instruct another individual to pin the tail on the donkey by saying 'left, right, up, down'.

References


Resources

- Inverting goggles, prisms or mirrors.
- Eye patch if using single prisms.
- Donkey (either projected or printed). Provided below (see Fig 8.1).
- Cardboard donkey tail of appropriate size.
- Pin or Blutac® to attach tail.
- Copy of diagrams to illustrate mechanism of inversion by prisms. Provided below (see Fig 8.2).
Figure 8.1. Donkey

Figure 8.2. Inverting prisms. (a) shows single total internal reflection – the image is upside down and back to front. (b) shows double total internal reflection – the image is upside down but not right–left inversed.
2. Rest home roleplay

Tasks

Divide into groups of 4–6 people, then subdivide into pairs or threes. Each pair or three takes the ‘Floor X’ script, the other the ‘Floor Y’ script. After a short practice, perform the roleplay to the other people in the group. Discuss the differences in terms of control and responsibility.

Floor X

Gwendolyn: Thank you for watering my plant every day, it looks very healthy.
Nurse: You’re welcome. We want you to be happy here.

Nurse: Your furniture has been arranged to make you as comfortable as possible, everything is convenient and organised. We hope you are happy with everything.
Aled: Yes, thank you, everything is fine.

Gwendolyn: Did you say there were films on this week?
Nurse: Yes, that’s right. We have selected the one that we think you will enjoy the most, so you have been booked a place to watch a film on the right night.

Aled: They really look after us well here, don’t they?
Gwendolyn: Oh yes, life is very easy. Everything is done for us – we hardly have to make any decisions at all.

Floor Y:

Gwilym: I’d like to move my plant to the chest of drawers. I know it might not grow as well there as it would on the window sill, but I’ll be able to see it all the time.
Nurse: That’s fine, either I can move it for you or you can change it round yourself.

Nurse: We want your room to be organised how you’d like it. If you want any furniture moved, I can arrange that for you.
Valerie: I’ll have a think and let you know, thank you.

Gwilym: There is a choice of films this week isn’t there?
Nurse: Yes, that’s right. There’s a different film on Thursday and Friday night. You just pick the film you think you will enjoy the most and turn up on the right night.

Valerie: They really look after us well here, don’t they?
Gwilym: Oh yes, life is very good. We have a sense of being involved, that we can make choices and are listened to. I’m very happy here.
Working it out: Individual activities

1. Responsible retirement

Tasks

Think about the issues for people who are approaching retirement. Many people find the transition from working life to being retired very difficult. To what extent are there problems related to control and responsibility?

Write an advice sheet that could help people to overcome some of these problems.
2. A walk on the deep side

Preparation

- Make the sets of cards in Resources for individuals or pairs to use. Note that the task can be made more difficult by making all the cards the same colour.

Task

Gibson & Walk (1960) used the visual cliff to test whether depth perception was an innate ability. There are several strengths and weaknesses to consider in their approach. Sort the blue cards into strengths and weaknesses. Get the students to allocate each blue card a black card, which extends the point being made.

Resources

Provided below are:

- Strength and weaknesses cards.
It is possible to measure an infant's cognition by their behaviour

<table>
<thead>
<tr>
<th>i.e. what the infants perceived was indicated by their choice to move or stay still.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The glass shelf on the apparatus ensured it was safe</td>
</tr>
<tr>
<td>even if the infant chose to cross over the deep side.</td>
</tr>
<tr>
<td>Having a central bridge and glass on both sides ensured that the infants’ decisions were based on vision alone</td>
</tr>
<tr>
<td>i.e. they could not use touch to help them to decide if moving across was safe.</td>
</tr>
<tr>
<td>The responses of different animal species and humans were similar</td>
</tr>
<tr>
<td>this suggests that the findings were valid.</td>
</tr>
</tbody>
</table>
The age of the babies varied from 6–14 months so probably some were more mobile than being ‘just able to crawl’.

The infants had visual experience of the world prior to being able to crawl and this would provide an opportunity to learn about depth perception.

The infants may have been distressed by the edge of the ‘cliff’ as they would have been unaware that they were actually safe.

The mothers gave consent for their infants to take part but the participants themselves did not and they were unable to indicate any desire to withdraw if they were distressed.
Research methods

1. Looming boxes

An alternative way to study an infant’s depth perception to the visual cliff is to test their response to an object coming towards them. Approaching objects increase in size. This ‘looming’ effect causes the retinal image of an object to rapidly expand in size. This was essentially the approach used by Bower et al. (1970). They moved box-shaped objects towards the faces of babies aged less than two weeks and recorded their responses.

1. a. In an experiment using the technique described above, the DV would be the infant’s response to the looming object. Suggest three ways that the DV might be measured.

   b. Bower et al. would have needed to record their observations of the infants. Devise a coding system for your suggested measures of the DV.

2. Explain one reason why it may be better to use Bower et al.’s technique of testing the response of an infant to a looming object than that of measuring tendency to move across the visual cliff employed by Gibson & Walk.

3. Identify two factors that it would be important to control in a study based on Bower et al.’s method and explain why these variables are important.

4. a. Describe one ethical issue raised by Bower et al.’s experiment.

   b. Describe the ethical guideline that the issue you have identified contravenes.

   c. Describe one way to reduce the impact of this ethical issue.

5. a. Define ecological validity.

   b. Do you think that Gibson and Walk’s or Bower et al.’s method is more ecologically valid? Justify your answer.

6. Bower et al. found that babies responded in the same way if tested with only one eye open but not when they were shown pictures rather than real objects. Were these different aspects of the study variations in the IV, the DV or controls?

Reference

2. Dental designs

Introduction

A student decides to conduct some research at his local dental surgery. There are two dental hygienists. One is a bit dictatorial, getting on with what she thinks needs doing, telling patients how they should use dental floss and which kind of toothbrush they should be using – soft, medium or hard. The other hygienist is more open minded, advising patients about what needs to be done and checking that they are happy with her plan before starting, asking the patients whether they want any advice on flossing, and whether they think they are using the right sort of toothbrush. The student classified the two hygienists as 'low control' and 'high control' respectively.

Questions

1. The student decides he will conduct an experiment to find out whether the patients seeing the two different hygienists differ in their satisfaction with the service they have received.
   a. Identify the independent variable being tested by the student.
   b. One way that the student could collect information about the patients’ satisfaction would be to interview them. Outline two types of question that could be used in an interview.
   c. Describe one advantage and one disadvantage of interviewing patients rather than giving them a questionnaire in this situation.
2. a. Identify one variable the student should control in order to produce valid results.
   b. Describe how the student might control the variable that you have identified.

3. The sample would consist of patients at the dental surgery who attended on the days the student was working and who were willing to be interviewed.
   a. Identify the sampling method being used.
   b. Suggest one alternative sampling method that might be used and describe how it would be used in this situation.
   c. Why is it important that a large sample is obtained?

4. This investigation is likely to have high ecological validity.
   a. Define the term ‘ecological validity’.
   b. Explain why this investigation is likely to have high ecological validity.
Revision activities

1. Langer & Rodin: strengths and weaknesses

Strengths of Langer & Rodin's study include using a large __________ (of 91 residents). This is good because findings from larger samples are more likely to __________ as the diversity in the sample is more likely to be representative of the ___________. Another aspect that increases the validity of the findings is that the experiment took place in a ___________. By using residents in a nursing home the researchers could be confident that the findings were ___________ of actual experiences. As the situation was specific, e.g. using two different groups of residents, the procedure could be ___________ in other similar homes. Rigorous experimental ___________ were also implemented. This ensured that only the ___________ (of choice and responsibility) differed between the two conditions. For example, both groups of residents received a similar ___________ given by ___________ person and residents in both groups had been in the home for about the same length of time. The residents were unaware of the differences in procedure between the two groups as they were on different ___________ of the nursing home. Furthermore, the nurses who assessed the patients were ___________ of the purpose of the study. This is called a ___________ procedure and helps to reduce the effects of ___________, and bias by the nurses.

However, the residents were divided up on the basis of the pre-existing floors on which they lived so the groups may not have been ___________. This makes the study a quasi-experiment as in true experiments the participants should be ___________ to the levels of the independent variable. In this situation, such a procedure would have been ___________ unacceptable as friends would have been separated. One important difference that existed before the experiment was that the enhanced choice and responsibility groups were somewhat ___________, ___________ active and likely to visit other residents although they were slightly ___________ alert. One problem with the ___________ was the wording of the question about how much control residents felt they had, which was not understood by many residents and the findings from this were disregarded even though it should have provided very important information for the study.

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Words for Langer & Rodin activity

- controls
- demand characteristics
- double blind
- ethically
- floors
- generalise
- happier
- independent variable
- less
- more
- population
- questionnaire
- randomly allocated
- real life setting
- replicated
- representative
- sample
- talk
- the same
- unaware
- well matched
Answer to Langer & Rodin activity

Strengths of Langer & Rodin’s study include using a large sample (of 91 residents). This is good because findings from larger samples are more likely to generalise as the diversity in the sample is more likely to be representative of the population. Another aspect that increases the validity of the findings is that the experiment took place in a real life setting. By using residents in a nursing home the researchers could be confident that the findings were representative of actual experiences. As the situation was specific, e.g. using two different groups of residents, the procedure could be replicated in other similar homes. Rigorous experimental controls were also implemented. This ensured that only the independent variable (of choice and responsibility) differed between the two conditions. For example, both groups of residents received a similar talk given by the same person and residents in both groups had been in the home for about the same length of time. The residents were unaware of the differences in procedure between the two groups as they were on different floors of the nursing home. Furthermore, the nurses who assessed the patients were unaware of the purpose of the study. This is called a double blind procedure and helps to reduce the effects of demand characteristics, and bias by the nurses.

However, the residents were divided up on the basis of the pre-existing floors on which they lived so the groups may not have been well matched. This makes the study a quasi-experiment as in true experiments the participants should be randomly allocated to the levels of the independent variable. In this situation, such a procedure would have been ethically unacceptable as friends would have been separated. One important difference that existed before the experiment was that the enhanced choice and responsibility groups were somewhat happier, more active and likely to visit other residents although they were slightly less alert. One problem with the questionnaire was the wording of the question about how much control residents felt they had, which was not understood by many residents and the findings from this were disregarded even though it should have provided very important information for the study.
Words in answer order

- sample
- generalise
- population
- real life setting
- representative
- replicated
- controls
- independent variable
- talk
- the same
- floors
- unaware
- double blind
- demand characteristics
- well matched
- randomly allocated
- ethically
- happier
- more
- less
- questionnaire
2. Perceptual development

a. Revision website

Complete the online quiz about Gibson and Walk at this location. (It is actually from a language site, rather than a psychology one, but is still useful. It provides 'hints', one letter at a time and can be checked online.)

http://claweb.cla.unipd.it/home/nwhitteridge/Tests/test101audioc.htm

b. Label the diagram below
Complete diagram of visual cliff
Gifted and talented activities

1. Adults learning to see

a. Read about SB (studied by Gregory & Wallace, 1963), an individual who lost his sight when very young but regained it in late middle age. What do his experiences tell us about whether perceptual abilities are learned or innate? How do these conclusions compare with those of Gibson & Walk?

b. A recent study, Yoshimura (2002), compared up-down and left-right inversion using goggles. Before reading the abstract, think about reasons why an up-down or a left-right reversal may be easier to adapt to.

c. Do you think that, if we do learn to adapt, what we are learning is to perceive the new information accurately or to respond appropriately to an altered perception? This issue was tackled by Marotta et al. (2004).

References


Resources

- http://www.rps.psu.edu/probing/vision.html – This article compares the case of SB with another, more recent example with a very different outcome.
- http://www.wfu.edu/art/art111/files/12_tosee.pdf – A readable, though long, account of another patient (by Oliver Sacks)
- http://www.centenary.edu/attachments/philosophy/aizawa/conferences/UteoP.pdf – (page 3 has a very brief description of the above two cases)
Gifted and talented activities contin.

2. Co-ordinating care

Tasks

Imagine you have taken over as the new manager of a residential home and you want to improve the standards of care.

Prepare an advice sheet for the staff giving them guidance on how to enable residents to have more control over their lives without compromising their care. Base your advice on the findings of Langer & Rodin and use this to justify your suggestions.

A carer enjoys a cup of tea and chat with her elderly patient
Think psychologically

1. Guarantees for grandma

Comfort Coach House

The Coach House retirement home provides an outstanding level of care. Residents have their every need attended to by our excellent staff. The nurses are dedicated to maximising our clients’ health and happiness. This home-from-home environment is clean, secure and seamlessly run. A healthy diet, selected for its suitability for the elderly, provides daily meals carefully chosen by our chef. The décor is of excellent quality, each room co-ordinated with an expert eye. Our approach ensures that we achieve a level of comfort for our guests that could not be guaranteed anywhere else – all within the highly desirable setting of our converted coach house.

Choices Chambers

The Chambers retirement home aims to provide an open, accepting environment in which residents can live happily. Our staff policy ensures that residents have a lot of freedom without compromising their safety or health. Through this we aim to ensure that our residents feel they retain some responsibility for their own social and physical environment and activities. Daily menu alternatives are available and furnishings such as chairs and curtains are selected by the individual from our store allowing rooms to be personalised. Through these choices we hope that we offer our guests a rare level of options and opportunities.

Tasks

Above are two advertisements. Outline why you would prefer your grandmother or father to stay in one or the other. Justify your decision using the findings of Langer & Rodin.

Imagine your brother or sister disagrees with you. What arguments could they raise? Think about the criticisms they could raise against Langer & Rodin’s research.
2. Weighing up wheelchairs

Tasks

You are a research assistant investigating how well older adults cope with becoming wheelchair users. Design a questionnaire to find out which issues are important. You might think about what considerations there are in terms of:

- the chair itself (weight, steering, foldability, whether it goes in a car etc.)
- what constraints they currently experience
- what it will enable the user to do that they cannot do without it
- how much freedom it might give them.

When you design the questionnaire, try to use different question styles. Include ones that will gather both qualitative and quantitative data.
Just looking

- This site illustrates lots of different pieces of apparatus used in psychological research, including the visual cliff. [link](http://www.brainbehaviortest.net/zboard.php?id=TestList&page=2&sn1=) [desc](http://www.brainbehaviortest.net/zboard.php?id=TestList&page=2&sn1=) [select_arrange](http://www.brainbehaviortest.net/zboard.php?id=TestList&page=2&sn1=) [divpage](http://www.brainbehaviortest.net/zboard.php?id=TestList&page=2&sn1=) [headnum](http://www.brainbehaviortest.net/zboard.php?id=TestList&page=2&sn1=) [asc](http://www.brainbehaviortest.net/zboard.php?id=TestList&page=2&sn1=) [no](http://www.brainbehaviortest.net/zboard.php?id=TestList&page=2&sn1=)

- The CN Tower in Toronto has a glass floor at 342 m (1,122 feet) from which you can look down on the city – if you dare (see [link](http://www.canada-cool.com/COOLFACTS/ONTARIO/TorontoCNTower.html)). Some photographs can be seen at [link](http://www.granneman.com/images/050817CNTowerGlassDenise.jpg) [desc](http://www.granneman.com/images/050817CNTowerGlassDenise.jpg) [select_arrange](http://www.granneman.com/images/050817CNTowerGlassDenise.jpg) [headnum](http://www.granneman.com/images/050817CNTowerGlassDenise.jpg) [asc](http://www.granneman.com/images/050817CNTowerGlassDenise.jpg) [no](http://www.granneman.com/images/050817CNTowerGlassDenise.jpg). Gibson & Walk demonstrated that young infants understand that glass is solid – but even though they would pat the glass on the deep side they wouldn’t cross. Despite the knowledge that the glass floor is five times stronger than it needs to be and would support 14 large hippos, we find stepping onto it contravenes an innate instinct for self-preservation.