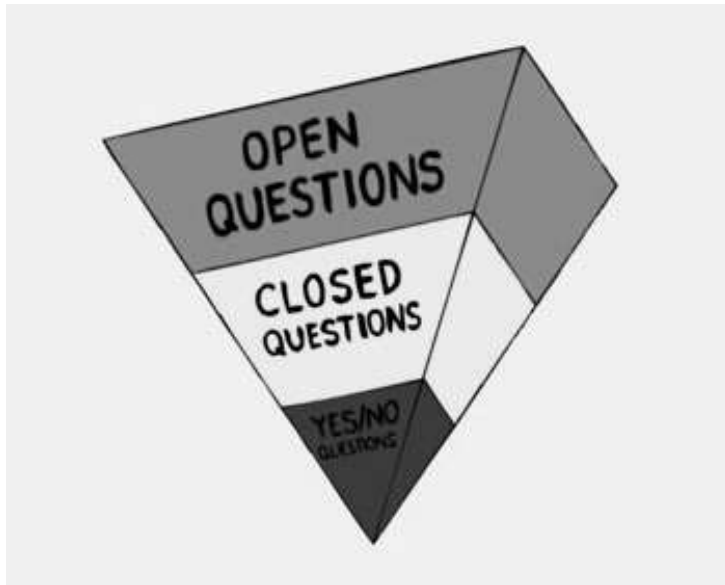
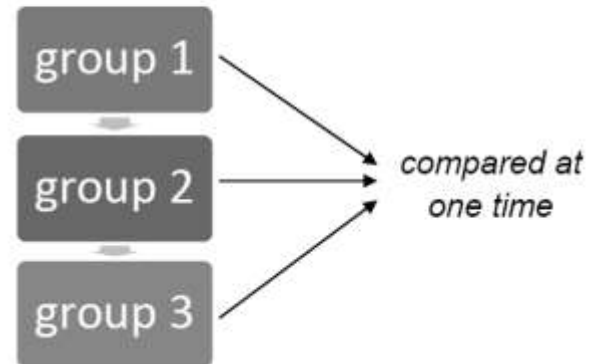


**Using open-ended questions and
other key survey design decisions**



Cross-Sectional Research Study:

different groups



IMPORTANT SURVEY DESIGN DECISIONS

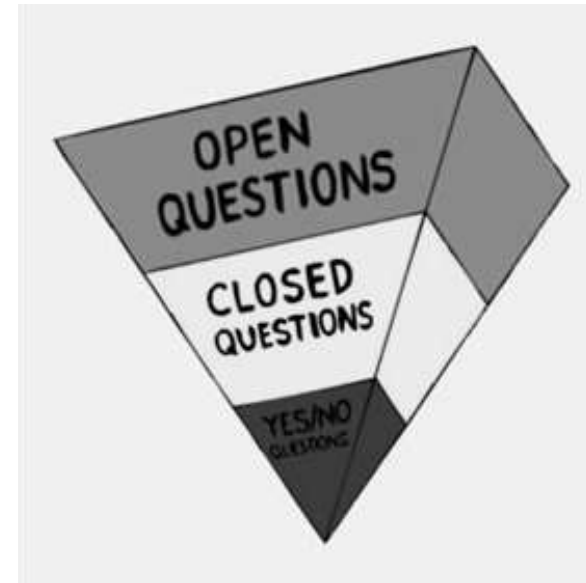
Forks in the road

Mixed methods or only survey?

- Additional research can help improve your survey.
- Preliminary research findings can help decide on appropriate survey questions and response options, terminology and phrasing.
- Post-survey research can allow you to follow-up on survey results:
 - E.g. focus group/interviews with survey participants.

Open or Closed?

- Surveys use either open- or closed-ended questions.
 - Closed-ended:
 - Choose a [pre-selected](#) response option.
 - Produces [quantitative](#) data.
 - Open-ended:
 - [No pre-determined](#) options, you generate your own response.
 - Produces [qualitative](#) data.



Question Type	Strengths	Weaknesses
Closed-ended	<ul style="list-style-type: none"> • Easy to administer and complete • Easy to process and analyze • Enhance comparability of responses 	<ul style="list-style-type: none"> • Generate limited detail • Sensitive to design errors • Time-consuming to design
Open-ended	<ul style="list-style-type: none"> • Respondents can answer in their own terms • Limited researcher bias • Useful for exploring areas of limited researcher knowledge 	<ul style="list-style-type: none"> • Time-consuming analysis (<i>coding</i>) • Require greater effort from respondents

Table adapted from 'Strengths and Weaknesses of Closed- and Open-ended Questions' from *Doing Real Research* by Jensen, E. and Laurie, C. (SAGE, 2014).

Open or Closed?

- Both types of questions have pros and cons.
- A combination of these question types can improve your survey as both kinds of questions can be used together to support and reinforce each other.

Closed Ended Question:

How much time do you spend studying?

A) 1- 8 hrs B) 9- 18 hrs C) > 18 hrs

Open Ended Question:

Tell me about your study habits....

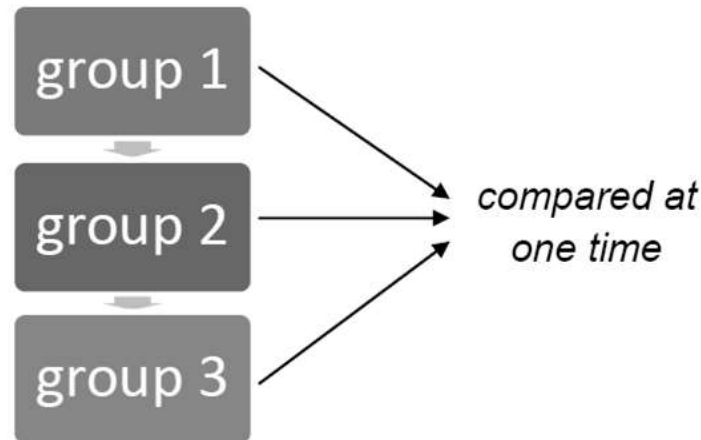
Open-ended Questions

- Respondents can freely report their experiences and attitudes without the restraint of response categories.
- This question type may be time-consuming and should not be used repeatedly.
- Open-ended survey data can be more of a challenge during data entry and data analysis.

Cross-sectional or Longitudinal?

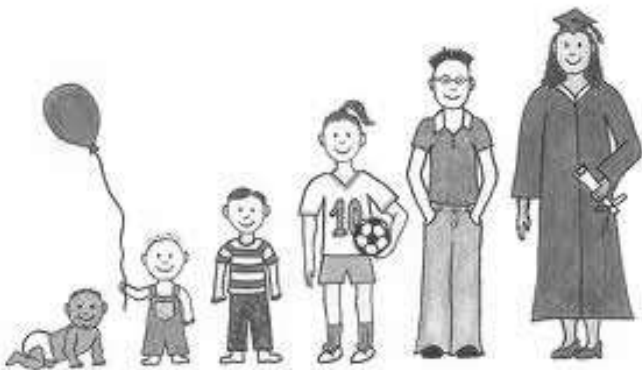
- Cross-sectional surveys are done at a single point in time:
 - Most commonly used: simple, low-cost option.

different groups



Cross-sectional or Longitudinal?

- Longitudinal studies use 2+ linked studies measuring change over a period of time:
 - Lapse between studies can be hours, days, weeks or years.
 - Often seen as impractical: time-consuming, costly.



Self- or Verbally-administered?

- Self-administered survey: respondents read and complete the survey themselves:
 - Usually online, but can be distributed face-to-face.
- Verbally-administered survey: researcher or trained assistants go through the survey with respondents providing their answers verbally or pointing to a chosen category:
 - Over the phone, face-to-face.

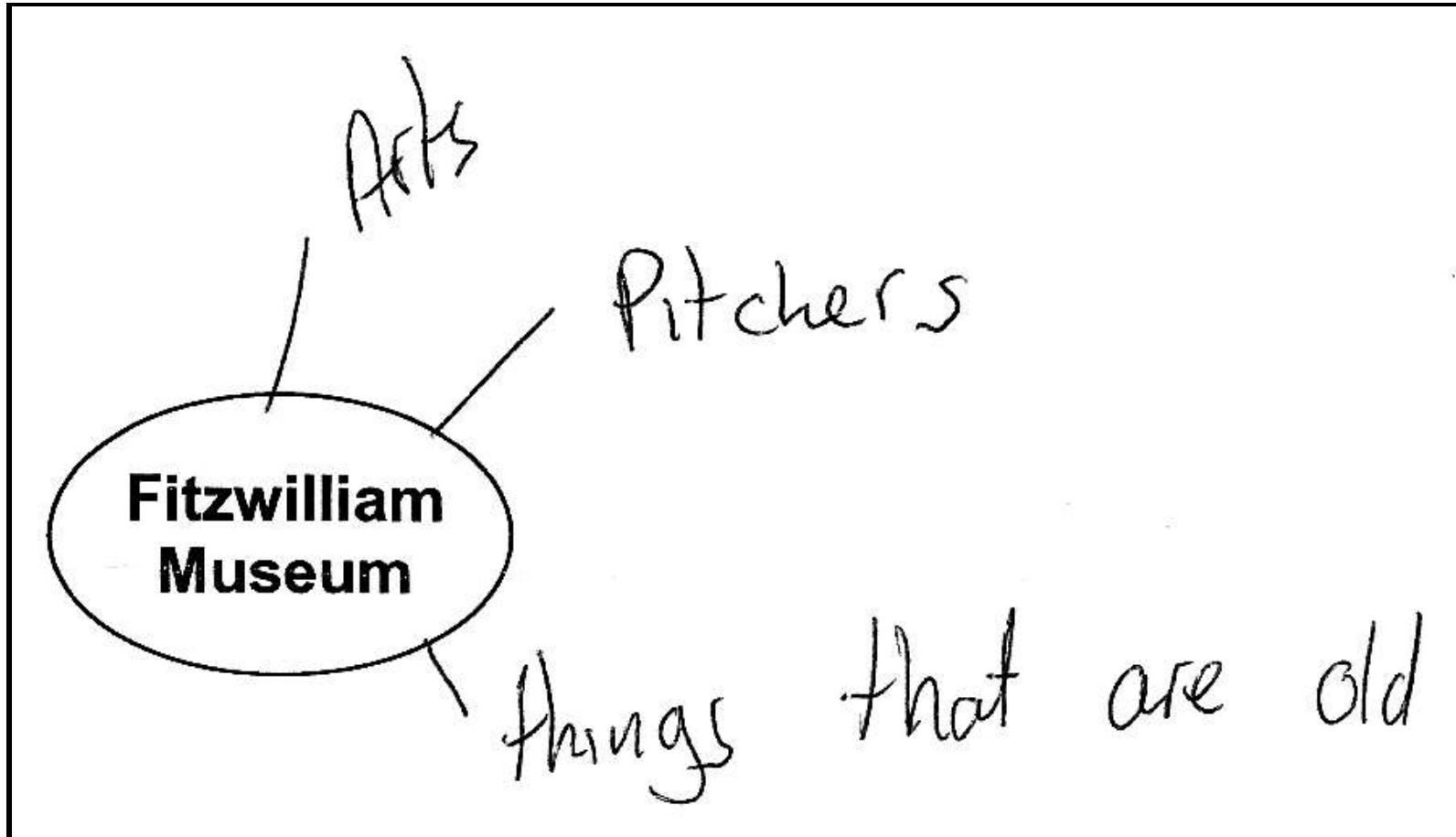
Survey Type	Strengths	Weaknesses
Self-administered	<ul style="list-style-type: none"> •Allows for data collection from multiple individuals in different locations simultaneously. •Can offer respondents full anonymity. •Respondents may be more likely to provide honest answers on sensitive topics. •Allows survey to be completed in the respondents own time (useful for lengthy open-ended questions). •Saves researcher time and resources. 	<ul style="list-style-type: none"> •No opportunity to clarify any unclear phrasing from the survey instructions or questions. •Achieving adequate response rates can be challenging (especially with postal and web surveys). •Can't probe for further details about a respondent's answer •Requires extra up front time investment to refine survey design.
Verbally-administered	<ul style="list-style-type: none"> •Opportunity to clarify aspects of the survey for respondent. •Easy for respondents to complete (little effort on their part). •Possible to gain further depth by asking 'probe' questions (e.g., "could you tell me more about that?"). 	<ul style="list-style-type: none"> •More expensive and time consuming; requires data collectors to conduct. •Risk of misquoting respondents when writing down responses. •If survey is recorded; lengthy transcription process for open-ended questions required.

'Self-Administered vs. Verbally Administered Surveys' from *Doing Real Research* by Jensen, E. and Laurie, C. (SAGE, 2014).

Options for collecting open-ended survey data

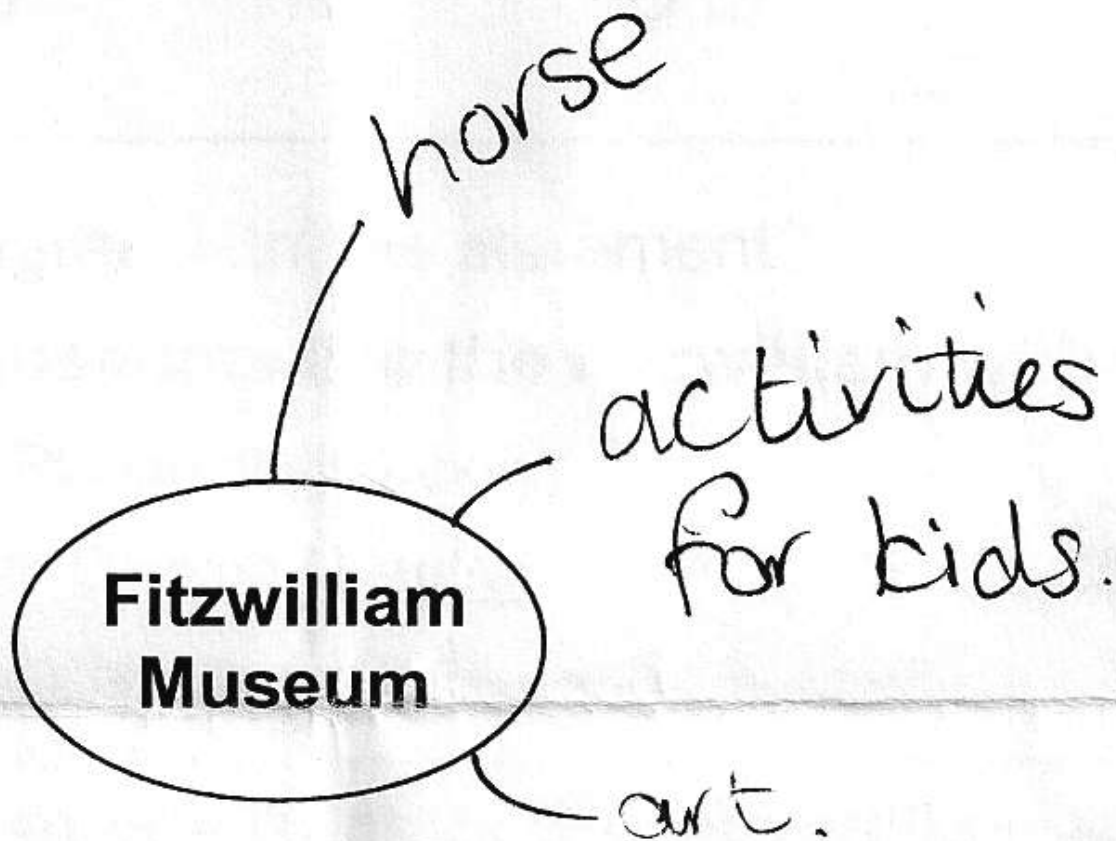


Pre-visit personal meaning map



Personal meaning map



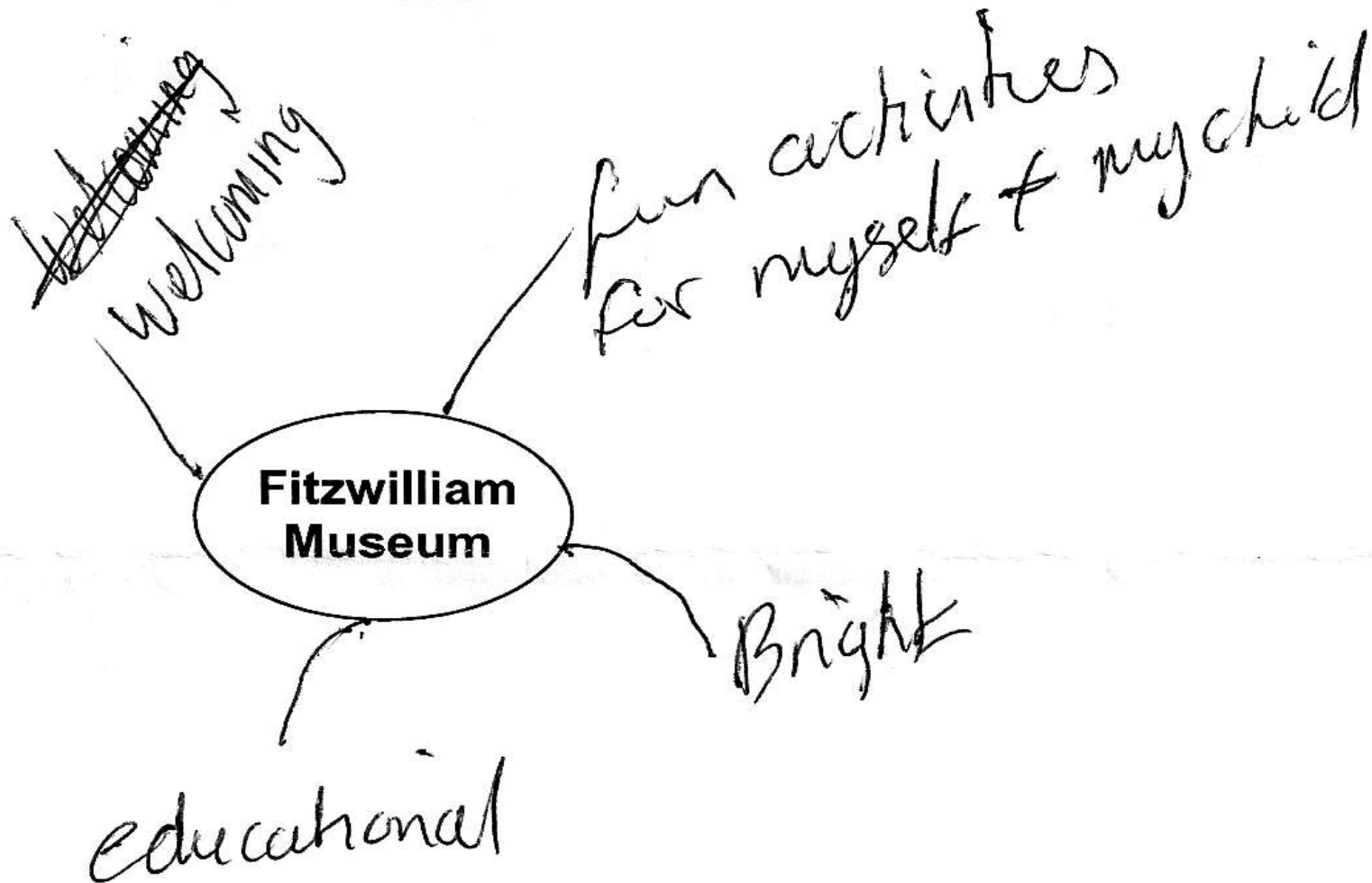


**Fitzwilliam
Museum**

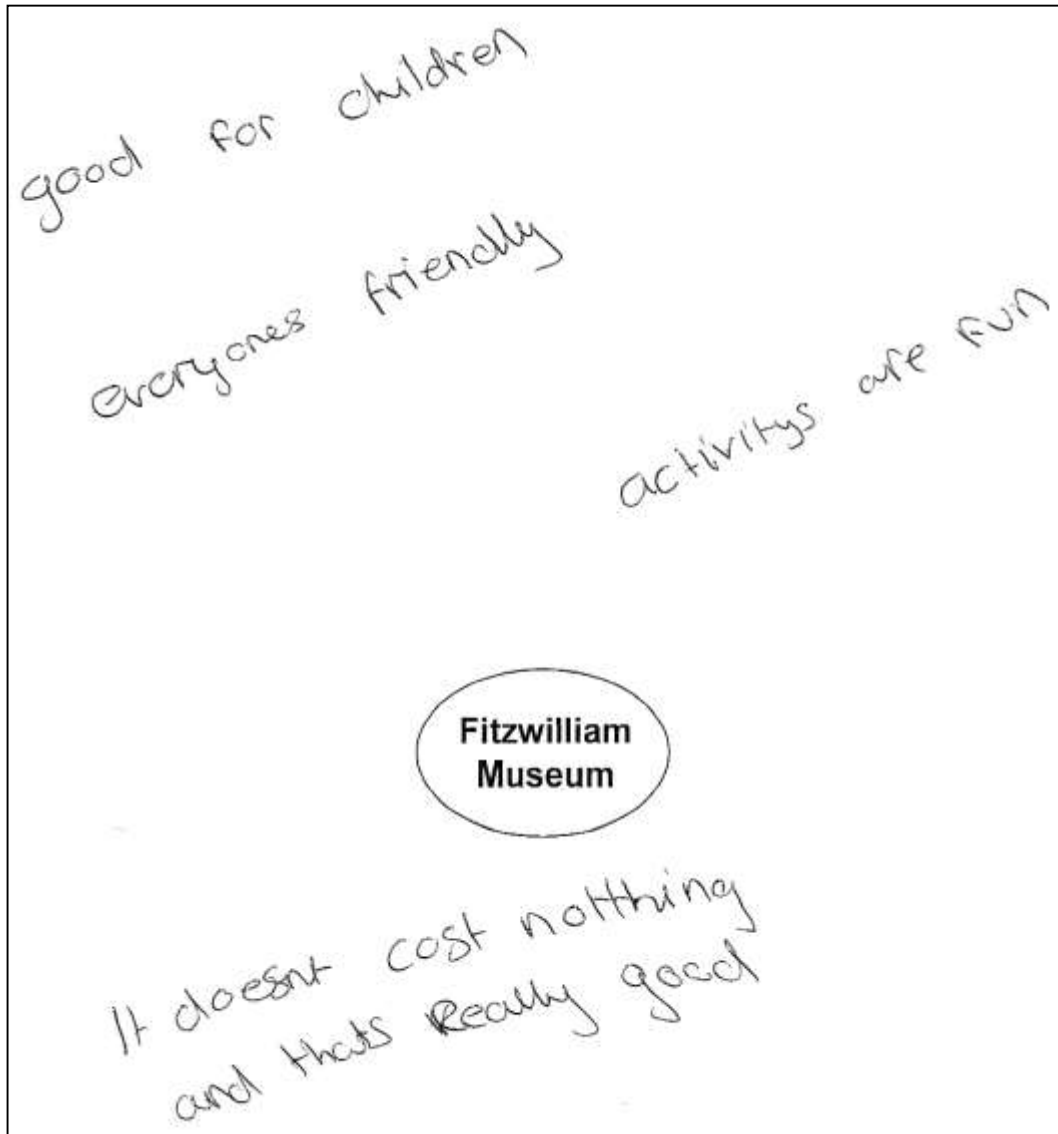
horse

activities
for kids.

art.



Post-visit



Thought-listing Data



Measuring Biodiversity Literacy in World Zoo and Aquarium Visitors



World Association of
Zoos and Aquariums
WAZA | *United for
Conservation*[®]



UN Decade on Biodiversity

WAZA official partner of United Nations Convention on Biological Diversity (CBD) during Decade on Biodiversity 2011–2020.



World Association of Zoos
and Aquariums | **WAZA**
United for Conservation



CBD

Aichi Biodiversity Target 1

Target 1: “By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.”



Research Team

Andrew Moss (Chester Zoo), Eric Jensen (University of Warwick) and Markus Gusset (WAZA Executive Office)

Plus international peer reviewers

30 WAZA member organisations from across the globe



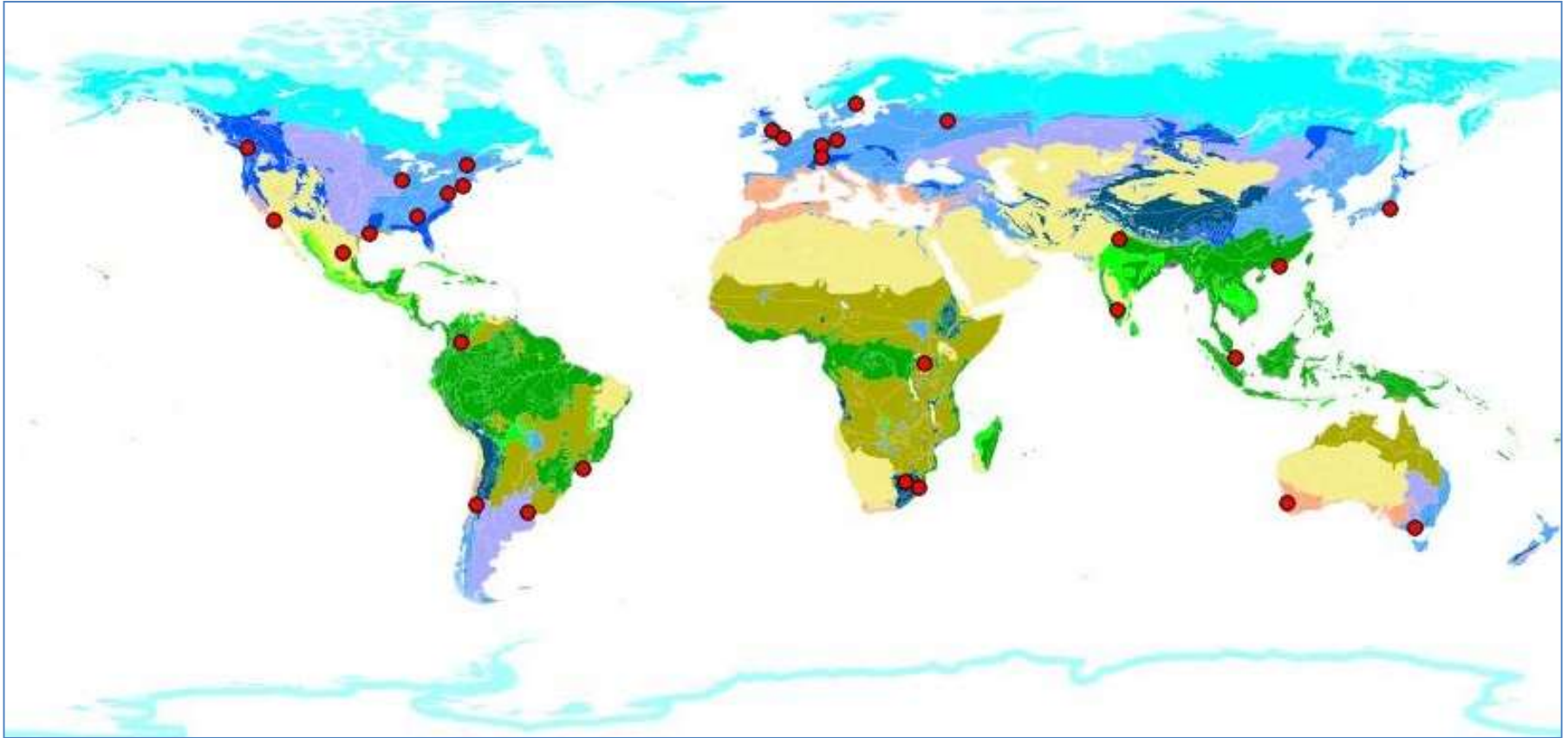
World Association of Zoos
and Aquariums | **WAZA**
United for Conservation





World Association of
Zoos and Aquariums
WAZA | *United for
Conservation*

Participants





Research Questions

1. How well do world zoo and aquarium visitors understand the term 'Biodiversity'?
2. Do world zoo and aquarium visitors understand the actions they can take to help protect Biodiversity?
3. Can zoos and aquariums make a difference with regard to Target 1?

Data Collection

Pre- and post-visit repeated-measures survey design: same respondents sampled before and after visit (more than 6,000 in total)



Data Analysis

- Both biodiversity literacy variables measured using matching open-ended questions in both pre- and post-visit surveys
- Yielded paired qualitative data for each respondent
- Data processed using robust content analysis framework
- Both biodiversity literacy variables converted to continuous quantitative data for statistical analysis
- Scores subjected to inter-rater reliability testing to ensure conversion was accurate



Survey Design

Single-page design with three main components:

1. Basic demographic information.

2. Two main dependent variables, each measured by open-ended questions:

- Biodiversity Understanding
- Knowledge of actions to protect Biodiversity

3. A number of potential independent variables also measured.



Pre-visit Survey

Visitor Survey

Institution

Date:

Visitor number:

<p>1. Time: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> AM / PM (circle)</p> <p>2. Is today your first visit to this zoo or aquarium? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NOT SURE</p> <p>3. If this is your first visit, is this your first visit to any zoo or aquarium? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NOT SURE</p> <p>4. How many times do you think you have visited any zoo or aquarium in the last 12 months? _____ visits</p> <p>5. Are you a season ticket holder or member? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NOT SURE</p> <p>6. What is your gender? <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE</p> <p>7. What is your age? _____ years</p> <p>8. How many years of formal education (in school, college and university) have you had? _____ years</p> <p>9. Do you live locally or are you visiting? <input type="checkbox"/> LOCAL <input type="checkbox"/> VISITOR / TOURIST</p>	<p>10. Please list anything that comes to mind when you think of 'biodiversity':</p> <ol style="list-style-type: none"> 1. 2. 3. 4. 5. <p>11. If you can think of an action that you could take to help save animal species, please list below: (Or if you cannot think of any actions, tick here <input type="checkbox"/>)</p> <ol style="list-style-type: none"> 1. 2. <p>If you listed an action above, have you done it in the last month? <input type="checkbox"/> NO <input type="checkbox"/> YES <input type="checkbox"/> NOT SURE</p>	<p>12. What prompted your zoo or aquarium visit today (tick all that apply)?</p> <table border="0"> <tr> <td><input type="checkbox"/> Fun day out</td> <td><input type="checkbox"/> Learn about animals</td> </tr> <tr> <td><input type="checkbox"/> See animals</td> <td><input type="checkbox"/> Entertainment</td> </tr> <tr> <td><input type="checkbox"/> Family time</td> <td><input type="checkbox"/> Other</td> </tr> </table> <p>If other, please specify:</p>	<input type="checkbox"/> Fun day out	<input type="checkbox"/> Learn about animals	<input type="checkbox"/> See animals	<input type="checkbox"/> Entertainment	<input type="checkbox"/> Family time	<input type="checkbox"/> Other
<input type="checkbox"/> Fun day out	<input type="checkbox"/> Learn about animals							
<input type="checkbox"/> See animals	<input type="checkbox"/> Entertainment							
<input type="checkbox"/> Family time	<input type="checkbox"/> Other							
		<p><i>This survey is done under the auspices of the World Association of Zoos and Aquariums (WAZA). For more information, please click on 'Visitor Survey' on www.waza.org.</i></p> <p><i>Thank you very much for completing this survey!</i></p>						



Post-visit Survey

Visitor Survey

Institution

Date:

Visitor number:

<p>1. Time: <input type="text"/> <input type="text"/> AM / PM (circle)</p> <p>2. How many people are in your group today (including you): _____ people</p> <p>3. During your visit today, did you see or hear any information about 'biodiversity'?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NOT SURE</p> <p>4. During your visit today, did you attend any informational animal talk or show?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NOT SURE</p> <p>5. During your visit today, did you talk to any zoo or aquarium staff or volunteers?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NOT SURE</p> <p>6. During your visit today, did you watch any videos or films?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NOT SURE</p> <p>7. During your visit today, did you use a smartphone application to enhance your visiting experience?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NOT SURE</p> <p>If YES, please specify the 'app':</p> <p>8. Have you watched any nature shows on television in the last 12 months?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NOT SURE</p>	<p>9. Please list anything that comes to mind when you think of 'biodiversity':</p> <p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p> <p>5.</p> <p>10. If you can think of an action that you could take to help save animal species, please list below: (Or if you cannot think of any actions, tick here <input type="checkbox"/>)</p> <p>1.</p> <p>2.</p> <p>If you listed an action above, have you done it in the last month?</p> <p><input type="checkbox"/> NO <input type="checkbox"/> YES <input type="checkbox"/> NOT SURE</p> <p>11. Which of these describe your experience at the zoo or aquarium today (tick all that apply)?</p> <p><input type="checkbox"/> Had fun day out <input type="checkbox"/> Learned about animals</p> <p><input type="checkbox"/> Saw many animals <input type="checkbox"/> Was entertained</p> <p><input type="checkbox"/> Had good family time <input type="checkbox"/> Other</p> <p>If other, please specify:</p> <p>12. Are you part of a conservation, nature or environmental group of any kind?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NOT SURE</p> <p>13. 'I would be willing to participate in further research on this topic':</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>If YES, please provide e-mail address:</p>
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Data Processing and Analysis

- Dependent variables were content analysed to produce quantitative data:
 - Biodiversity understanding/literacy - scored along a continuous scale of understanding*
 - Knowledge of actions to protect biodiversity – were scored along a continuous scale of personal action^

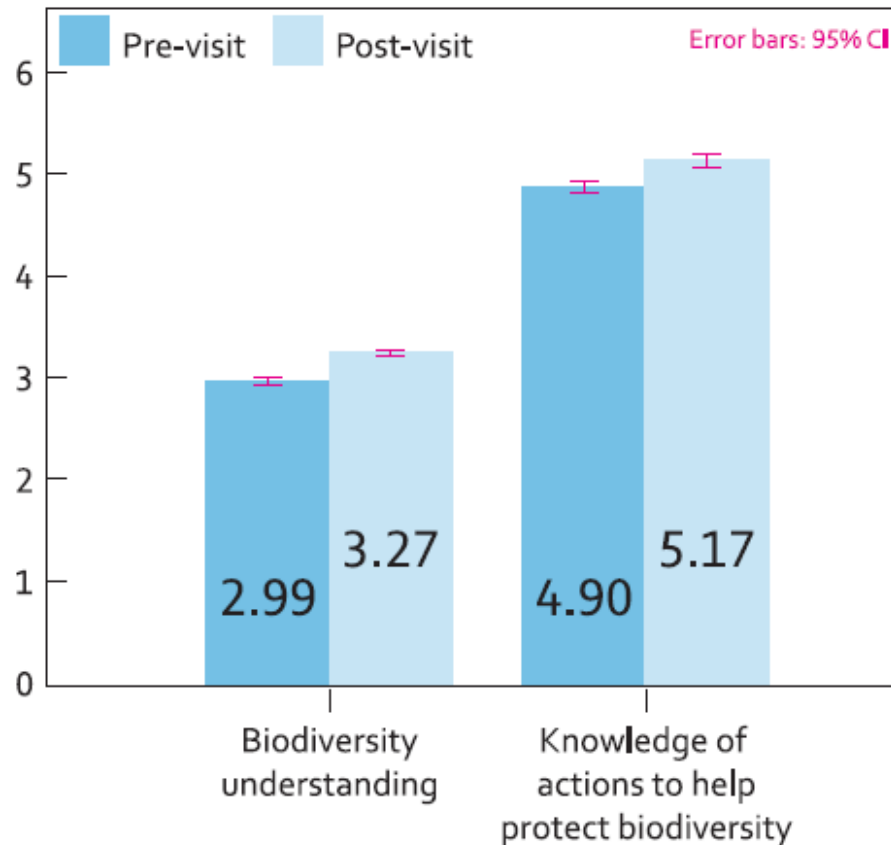
Inter-coder reliability (Cohen's Kappa): *= 0.82; ^=0.84

Analysis of conservation 'actions'

- (0) Action or behavior identified not relevant to conservation.
- (1) Vague platitudes about need for change (no specific action or behavior mentioned) – e.g., “save ecosystems”.
- (2) Specific identification of pro-biodiversity action or behavior, but is at a general level (not feasible to address as an individual) – e.g., “stop hunting”, “stop Chinese medicine”.
- (3) Very specific identification of pro-biodiversity action or behavior that can be done at an individual level – e.g., “drive less to reduce effects of climate change”.
- (4) Respondent clearly states a personal action or behavior – e.g., “I recycle my mobile phone for gorillas”.

Headline Results

Significant aggregate increases between pre- and post-visit in biodiversity understanding and knowledge of actions to help protect biodiversity



Headline Results

- Number of respondents demonstrating at least some positive evidence of biodiversity understanding: increase from pre-visit (69.8%) to post-visit (75.1%)
- Number of respondents that could identify a pro-biodiversity action that could be achieved at an individual level: increase from pre-visit (50.5%) to post-visit (58.8%)

Publications so far....

Peer-reviewed

Moss, A., Jensen, E., & Gusset, M. (2014). Conservation: Zoo visits boost biodiversity literacy. *Nature*, 508(7495), 186.

Moss, A., Jensen, E., & Gusset, M. (2014). Evaluating the contribution of zoos and aquariums to Aichi biodiversity target 1. *Conservation Biology*, in press.

Grey literature

Gusset, M., Moss, A., & Jensen, E. (2014). Biodiversity understanding and knowledge of actions to help protect biodiversity in zoo and aquarium visitors. *WAZA Magazine*, 15, 14-17.

Moss, A., Jensen, E., & Gusset, M. (2014). *A global evaluation of biodiversity literacy in zoo and aquarium visitors*. Gland: WAZA Executive Office.

Moss, A., Jensen, E., & Gusset, M. (2014). What do zoo and aquarium visitors know about biodiversity? *WAZA News*, 1+2(14), 26-27.

Annotated Drawings: Example



Evaluation questions

1. How and why is learning taking place within the zoo?
2. Are there any differences a zoo visit's impact for pupils attending a tailored educational presentation by zoo staff compared to teacher-only guided visits?

Pre- and Post – visit forms

(Repeated Measures Design)

Pre- and post-visit surveys completed the day before the zoo visit and the day after the zoo visit.

1. Thought-listing measure:

‘what do you think of when you think of a zoo?’ (x5)

2. Annotated drawing of ‘favourite wildlife habitat’ with all the plants and animals which live there

Name: Ikra Are you?: Boy / Girl (Please circle) How old are you?: 9

London Zoo Education – Pupil Evaluation Questionnaire (Primary)

Thank you for your help. This will help us to plan future Outreach activities for other school children.

*Have you ever been to a zoo? YES NO

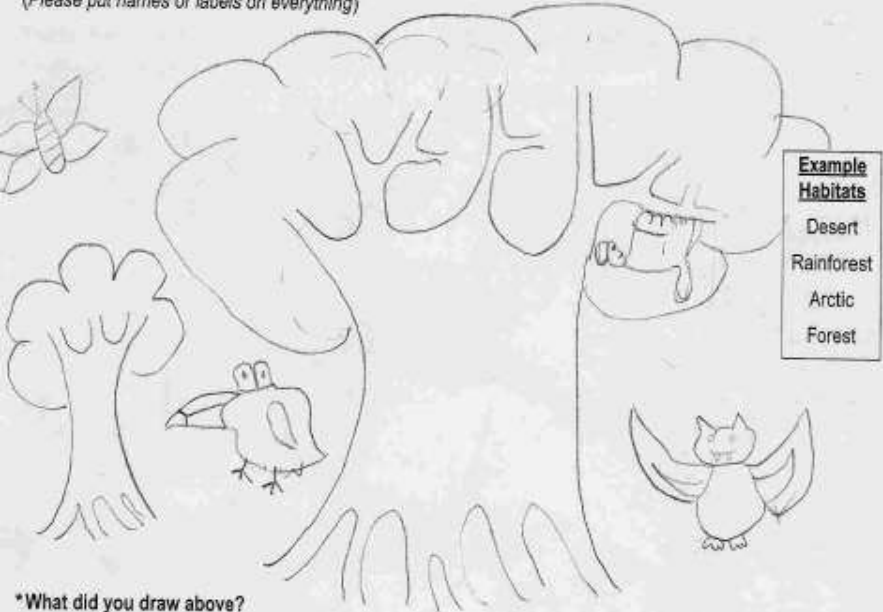
*What do you think of when you think of 'the zoo'? (write below):

- I think it is fun
- I think we can learn
- Case I like animals
- give them company.
-

*Zoos are for... (tick all you agree with)

- "Fun"
- "Learning about animals"
- "Seeing animals"
- "Saving animals from extinction"
- "Other reasons"

*Please draw your favourite wildlife habitat and all the plants and animals that live there.
(Please put names or labels on everything)



- Example Habitats**
- Desert
 - Rainforest
 - Arctic
 - Forest

*What did you draw above?
A Rain forest

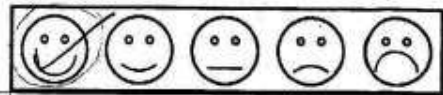
Name: Ikra Are you?: Boy / Girl (Please circle) How old are you?: 9 years

London Zoo Education – Pupil Evaluation Questionnaire (Primary)

Thank you for your help. This will help us to plan future days at the Zoo for other school children.

*Have you had fun at the zoo today? YES NO NOT SURE

*How was the London Zoo lesson today? (circle the face that shows how you feel)



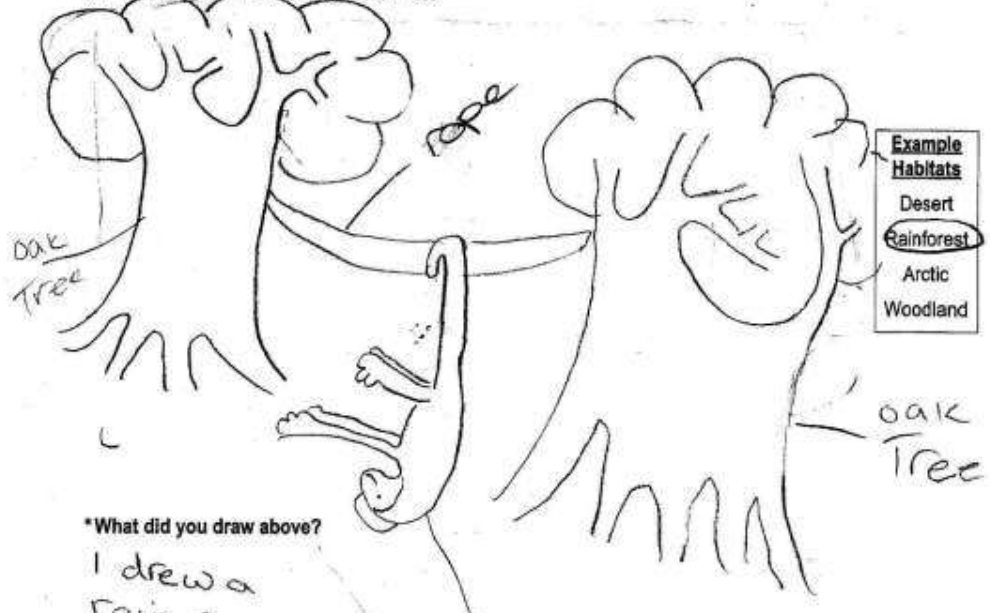
*What do you think of when you think of 'the zoo'? (write below):

- I thought it was fun.
- it was amazing.
- and it was a little
- disappointing.
-

*Zoos are for... (tick all you agree with)

- "Fun"
- "Learning about animals"
- "Seeing animals"
- "Saving animals from extinction"
- "Other reasons"

*Please draw your favourite wildlife habitat and all the plants and animals that live there.
(Please put names or labels on everything)



- Example Habitats**
- Desert
 - Rainforest
 - Arctic
 - Woodland

*What did you draw above?
I drew a rain forest with a spider monkey!

spider monkey

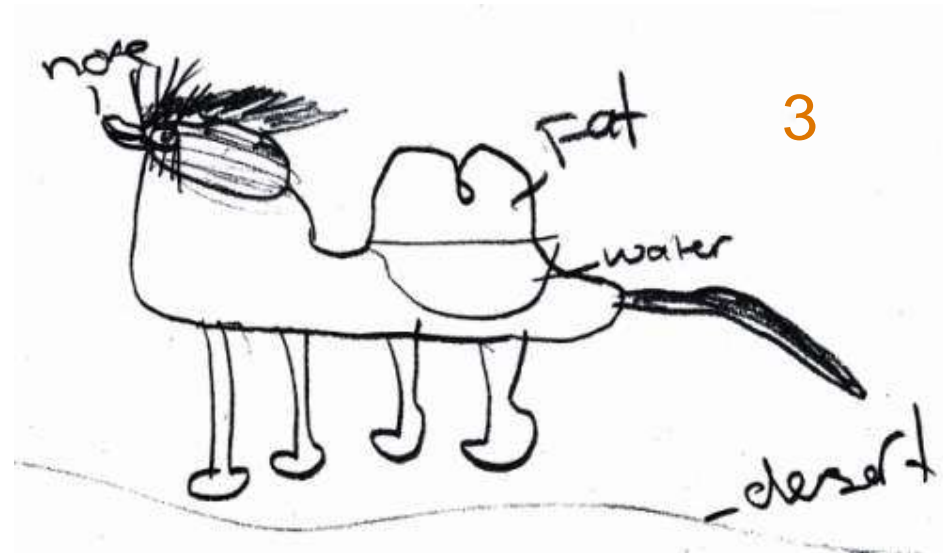
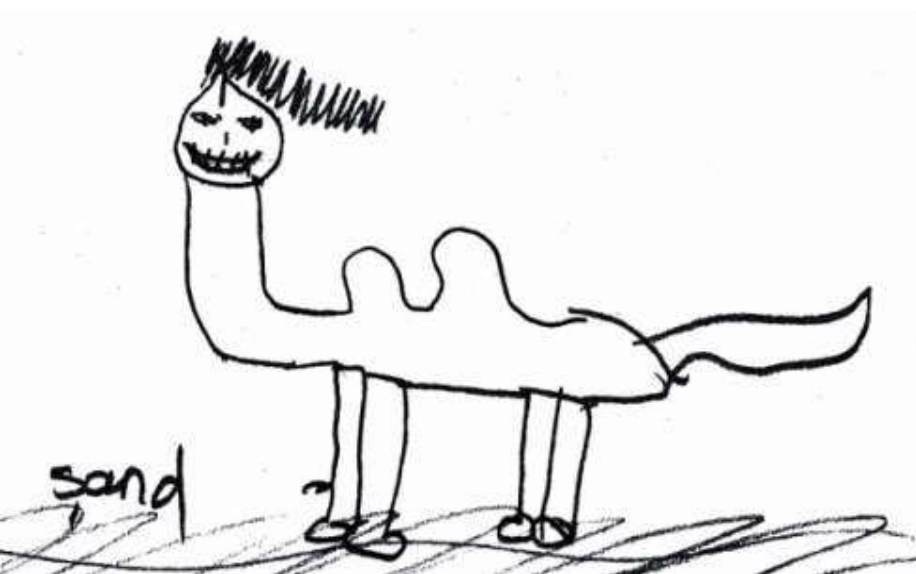
Annotated Diagrams of favourite habitat

Analysis of all paired forms – scoring on basis of 1-3

1= negative change in accuracy of representation (animals/habitat)

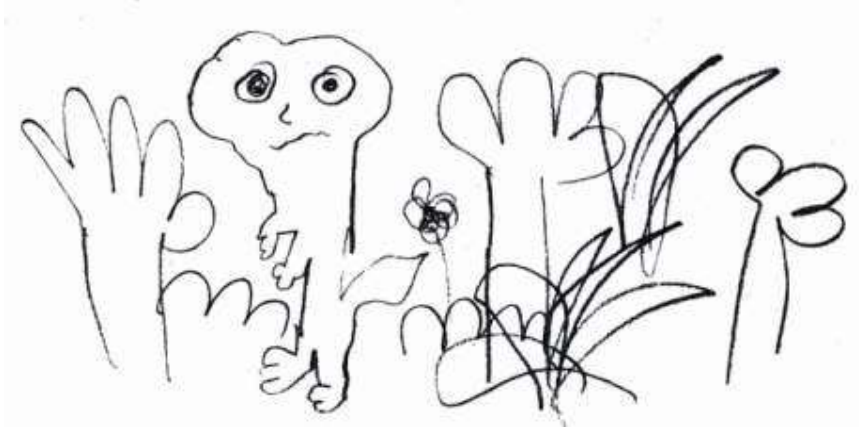
2= no change in accuracy

3 = positive change

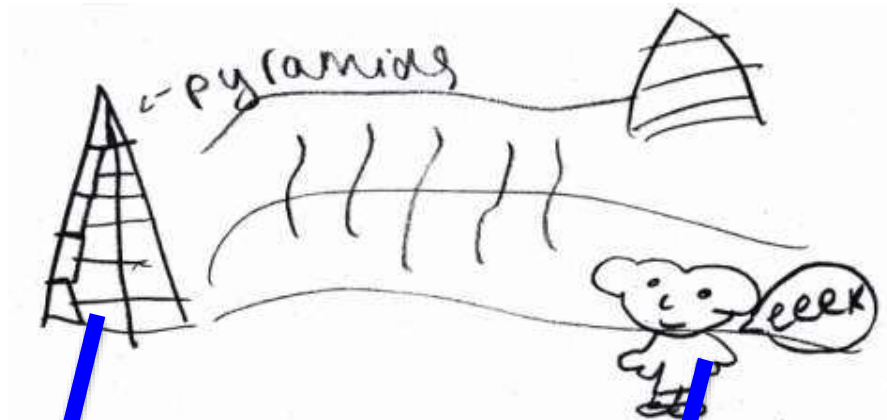


Deciding what 'counts'

Pre-session



Post-session



Wrong desert
country

Anthropomorphism

Coffee break!

A YAWN

IS A SILENT SCREAM

FOR MORE COFFEE