Chapter 11

Gender Differences Reflected in Conversations at Exhibits

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Abstract
Chapter 11
This chapter considers the remarks of school children taken on visits to animals as exhibits as revealed by analysis of their transcribed conversations and the effect of the adult with them aid wither they are in single gender for mixed groups. Some of their learning is in the home and their everyday surroundings, where they notice organism of their locality as well, as exotic species through various forms of media. Furthermore, adults may take them to museums, natural history museums and farms where they encounter animals not seen in their everyday lives. In some museums or wildlife parks they see skeletons of vertebrates and try to make sense of such. When a visit to a museum or other venue with animals exhibits, alive or preserved, they interpret with their existing knowledge. It is vital for teachers and museums to recognize the voice of the child in their spontaneous interpretation of everyday phenomena in in the zoos, aquaria a natural history museums, and parks, field and nature centers. Children firstly recognize an animal and name it to the nearest fit their own knowledge enables, then they describe silent features and on observable behaviors, usually in an anthropomorphic manner. In location exhibits they can identify relationships between organisms and some topographical features, in essence they interpret that which they see with narrative. The comments of boys and girls neither are not exactly the same nor are those from groups with adults and without adults. Whether the adult is a teacher or a chaperoned also affects the conversational content.

Out of school work is increasingly recognised as an essential part of a child's education and thus pre-service educators need to understand the area and differing aspects of such work which may affect the responses of learners. Informal science learning environments such as science centers, museums, and zoos provide students with captivating science experiences that can be related closely to curricular objectives. Informal science education environments provide students with unique, engaging science learning opportunities and classroom educators with a wealth of science teaching resources.

A persons' learning, which includes not only the scientific aspects but also contributes to the forming of attitude towards and understandings of the environment, are profoundly shaped by their feelings, experiences and understandings of living organisms' (Tunnicliffe and Reiss,

1999). Animals are key members of the environment; this chapter considers children, formative learners, and their responses to animals as exhibits in venues frequently chosen by educators to visit with their charges during curriculum time. Although the occurrence may be rare, out of a belief that there is more than science to be learned at an informal science setting, formal school groups are sometimes taken to museums, zoos, and aquaria for educational objectives of a cross - curricular nature (Tunnicliffe, 1992; Tunnicliffe, 1994). The gender of the viewer has an effect on the interest of a child and their learning opportunities and retention (Ramey- Gasseret 1997).

What is out of school learning in terms of biology? Braund and Reiss (2004) provide an overview of different aspects and venues and maintain that informal, non-classroom based contexts can make an important contribution to the learner's study of science, particularly Biology Educators preparing for working in the classroom, or in v endures of informal learning, should also be aware of the other kind of informal leaning, that which occurs outside the auspices of school. Children being taken to a venue outside the school are still within the jurisdictions of the school whether it be a field trip to a nature centre, a cultural museum, a science centre, a zoo, or even a walk in the immediate locality. They are conscripts in such visits, (McLaughlin, Smith and Tunnicliffe, 1998) there is no free choice about attending, because the visit is part of their formal curriculum. There may; however, be free choice in what take their attention and indeed what they may actively learn. That depends on what catches their interest (Schiefele, 1991). If we consider that there are 191 days in a year of which English learners attend state schools and school begins at 9 and finishes at 3:30 pm. (as do those for primary children), the children are in school 6 ½ hours, during which time they have at least an hour and half of recreational breaks and lunch so they have 5 hours of instructional time. Secondary pupils work later so have perhaps 6 hours of instructional time. Thus, if they attend school, for 38

weeks and a day weeks, the rest on average being holiday; they receive, in a week, 30 hours of schooling. However, in each school day they spend are 18 hours elsewhere. Whilst children may indeed be involved in after school clubs, weekend activities, after school lessons, this provision is not statuary schooling under the auspice of a national curriculum. Thus, the role of both school and educator is not necessarily the most important influence one child's learning.

Furthermore, the hours of school-based work tend, particularly in English State primary schools (5-11 years of age), tend to be focused on English (literacy) and Maths (numeracy). These subjects are routinely tested and the results of pupils against prescribed standards results are published for public viewing. The English National curriculum for primary (Key Stage 1 and 2) and Secondary (Key Stages 3 and 4) can be found on the UK Government website https://www.gov.uk/

Are Indeed Schools Places Where Children Really Learn?

The Council for Learning Outside The Classroom firmly believes that indeed learning outside the classroom changes lives, "that every young person (0-19yrs) should experience the world beyond the classroom as an essential part of learning and personal development, whatever their age, ability or circumstances" (lotc.org.uk).

Here we are discussing visits out of the classroom. These may be to museums in the widest sense but also outside the school buildings in the yard or grounds, in the environment. Even in the playground during recreation. The response of one seven year English boy being interviewed for a research project about understanding of certain items such as an ant, a daisy, and a pond, for a funded project, (Tunnicliffe et al., 2011) illustrates this. He told me he lay on the ground during his recreation time at the edge of the school field and watched ants. He could tell me a lot about these animals based on his first-hand observations during this time 'at 'school

but not 'in' school.

I have always maintained that visits, which also contain a focus on activities designed to be performed during a visit at exhibits, as well as school based activities before and after a visit are an integral part of the learning. Indeed, I instituted such when working at zoos. Such an approach increases both student motivation and learning (Osborne & Dillon, 2007).Well-designed visits with activities that can be done during the visit itself as well as pre- and post-visit activities to be done in the classroom and which are linked to the curriculum can considerably increase student motivation (Osborne & Dillon, 2007). Tunnicliffe and Scheersoi (2010) suggest that,

> The skill of the museum as a communicating institution through its interpretative techniques, is to link what the visitor already knows and feels with the information which the institution possess about its exhibits. In this way a meaningful museum experience is created for the visitor in terms of both personal context, enjoyment and the acquisition of information. (page 191)

In most cases they maintain, at an exhibit about animals or a viewing of any kind of animal, a typical biological interaction sequence: identify – interest – interpret – investigate. However, the order of these interactions may vary.

Three factors interact in a person when at an exhibit, cognitive aspects, emotional characteristics, and value characteristics so that, depending on the visitor, when an individual encounters an object there may then be no further interest or there may be interest. Such immediate interest is referred to as situational interest (e.g. Shiefiele, 1991). This may or may not develop into individual interested and, if the information is accommodated into that person's construct, learning occurs. Facilitators at an exhibit, or an adult in the everyday interacting with a

learner, can act as a significant other, a facilitator, and assist further leaning develop (Vygotsky 1962). The gender of the educators and the learners can also affect the learning if it is something that which catches their attention about which they comment .However, pre-service educators may have their own prejudices about viewing animal exhibits, particularly in zoos, and such need to be discussed and worked though before visits, because attitudes may be uniformed and may change. (Tunnicliffe, 2001).

Under whatever auspice children, and indeed the adults with them, are taken to look at animals they, as well as the person organising the visit, have an agenda which are known to affect their behaviour and learning (Anderson et al., 2008). These consist of content, time, objectives, and individual missions and rationale. Acknowledging such an understanding presents issues for the educators in their planning and delivery of educational aims and objectives for the visit. Thus educators in pre-service training should practice such an analysis and understand their own prejudices and preferences.

During a visit, learners, and indeed organisers, take on changing identities; several identities in one visit, depending on phase of visit (Falk, Heimlich, & Bronnenkant, 2008). Furthermore, visitors create conversations, which change in focus during and at the end of visits for which they have an entry narrative, which is likely to be self-reinforcing on learning and behaviour. Satisfaction relates to visitors matching their entry narrative (Doering & Pekarzik, 1996). The language used by adults focuses the attention of children on aspects of the immediate environment, and thus the presence of an adult with children, as McManus (1989) showed, affects the conversational behaviors. The adults accompanying the children are usually family members during leisure visits or school adults, educators, other school workers or a pupil's parent, during school visits. The adults with whom their children, or learners from their school,

visit a zoo have a critical role in influencing what the children observe.

Learning the names of animals is a key part in acquiring knowledge about biodiversity. In helping children to learn names adults point out the object and name it, and, unless they indicate that it is not the case, adults name whole objects, not parts (Niño, & Bruner, 1980). Initially, the children and their adults identify the specimen and name it and often comment on a salient feature or structure. At dioramas featuring animal specimens, they also describe behaviours and make affective comments. If their interest is caught, they start interpreting the scenes presented, mostly in anthropomorphic terms, seeking to relate the subject to what they know and understand. Visitors rarely read the information provided by the museum (texts) and interpret at the level of their biological knowledge, which is generally basic. They may raise questions about the subject, ask why, how and what and construct hypotheses.

The educators and chaperones accompanying primary school groups are nearly all female (Tunnicliffe, 1996b). Boys and girls behave differently in science museums (Diamond, 1994) . Moreover, the gender of staff is important in the museums. There is a close connection between science museums with a gender balance in staffing and what science educators see as important for encouraging young girls to learn science (Kremer and Mullins, 1992).

Listening and analysing the content of conversations generated at different types of animal exhibits by groups of boys only or only provide a foundation of information of what interest pupils of different genders. Such information is an important starting point in designing the curriculum for all pupils and providing equal but perhaps different access of opportunity for boys and girls. Furthermore, the data can assist museums and zoos in planning their interactions to take account of such gender differences.

Museum visits can be important in motivating people to learn more about science

(Diamond, 1994). It is salutary to remember that, unlike the activities in the science centres where most visitor studies research has been carried out, 'animal looking’ is not a hands-on experience of the same type. Attention and observation of exhibits may be cued by an inherent interest in animals, by prompts from guiding adults, from attention being captured by an action or unusual sight, from a task that has to be completed, or from the episodic memories and hence the stories engendered by the exhibit (Tunnicliffe, Lucas and Osborne, 1997). Indeed, the reminisces of older people elicited by viewing natural history dioramas at the Powell Cotton Museum at Quex Park in England reveal they remember when they lived in parts of Africa, or Kashmir and the impact that wildlife had on them as well as other memories. Their memories recounted to others aloes have an impact on the listener (Tunnicliffe and Scheersoi, 2015 p 191) Museum visits can be important in motivating people to learn more about science (Diamond, 1994). It is salutary to remember that unlike the activities in the science centres where most visitor studies research has been carried out, 'animal looking' is not a hands-on experience of the same type. Attention and observation of exhibits may be cued by an inherent interest in animals, by prompts from guiding adults, from attention being captured by an action or unusual sight, from a task that has to be completed, or from the episodic memories and hence the stories engendered by the exhibit (Tunnicliffe, Lucas and Osborne, 1997).

In work I carried out, I collected the spontaneous conversations of primary school groups at live, taxidermic, and robotic animals in relevant locations in England. The conversations were identified as having mixed gender groups, group of boys only or girls only. To facilitate the analysis of the transcripts the data were considered in terms of units of conversations. A unit of conversation was defined as the 'group conversation in front of any one exhibit from the beginning of the conversation until it ceased. The units of conversation were identified during

the typing of the transcripts from the voices of the different members of the group. The data are of conversational units generated by the group, which contained an adult as well as the children. The number of individual children involved in the conversations is not known.

An example of a unit of conversation and at a robotic animal exhibit is:

Location: Dinosaur gallery**,** Year 2 (6-7 Year old) pupils

Girl: Look/ it's'/ moving. /That's / a *Tyrannosaurus*

Adult: No it‘s not / It’s *Tectonosaurus*.

Girl: What is it /Camilla?

Girl 2: Look at/it’s/ neck

Adult: The big /one /moved its /leg then /I don't think it’s/quite dead.

Girl: Look / at its /neck.

Adult: Ugh!

There are a great many ways of analyzing conversations (Tunnicliffe and Reiss 1999). A systemic network was chosen. This is a means of grouping or categorising things, in this case conversations, to be a parsimonious representation of the data, while preserving the relationships between categories in such a way that comparisons can be made between groups. It is a type of analysis that changes qualitative into quantifiable data and each topic of conversation was coded according to the systemic network developed from the work of Bliss et al. (1983). After initial analysis it was apparent that the comments were grouped within four super ordinate categories, namely those concerned with the front end of the animal, those associated with the dimensions of the animals; those features which were unfamiliar to the viewers and included structures such as penises, nipples, horns and claws; and disrupters, the legs and tails of animals which disrupt the outline of the animals’ shape (Tunnicliffe, 1996a).

The preliminary inspection and categorising of the pilot conversations showed that the visitors looked at specific attributes of the animals, identified according to their understanding, often naming an animal to the nearest fit. An Arabian Oryx for example was named as a goat, the nearest known specimen to which the visitors (a three generational group of females) could name. They ask questions and make statements about what they already know, and comment on their own experiences talked about their whereabouts and gave instructions to each other.

The four main super ordinate categories were ‘social comments’, ‘exhibit focused comments’, ‘management and social comments’ and ‘exhibit access’ or ‘orientation comments’ in which visitors searched for or located the animals. A ‘dustbin category’ for topics such as security announcements, which were uncategorised, was provided. The comments directly referring to the exhibits were divided into ‘other exhibit’ comments, those about other aspects of the exhibit (such as the rocks behind the dinosaur models) and those, which focused on animals. The animal-focused category was subcategorised into five subordinate groups: (1) Interpretative comments, which included knowledge source comments such as questions and references to a source of the information proffered, human resemblances; (2) Affective comments which included emotive responses such as ‘Ah!’ or ‘Ugh’ as well as comments about other attitudes, namely human-animal interactions (and vice versa) and welfare comments; (3) Environmental comments referring to the natural habitat or endangered status of the species; (4) Voiced comments about the animals’ structure, behave your; and (5) Names for the animals, every day and occasionally scientific

If more than one comment of a particular category (e.g. a name) occurred within a single conversation, it was not scored again. Hence the analysis shows the number of conversations within which a topic is mentioned not the number of overall times that a topic is mentioned.

Issues of the species. A fine-grained coding for ‘body parts’ or anatomical attributes commented upon by the groups was used, again allocating a number to the noun. There were 56 categories in the network

Each conversation unit was categorised with the appropriate number from the networks. Hence a section of a conversation at robotic dinosaurs was represented in the following way.

Location: Dinosaur gallery

Year 2 Group (6 or 7 years old)

3/ 21/ 43

Girl 2: Look at/ its/ neck

3/21 43

Girl: Look / at its /neck.

28

Adult: Ugh!

Some comments were categorised more than once. For example ‘Look!’ was categorised as a management statement as well as one of exhibit access because it was an ostensive remark. The reliability of the network was checked.

Certain aspects of the exhibits are commented about more often in groups with only boys than are done so by girls. (Tunnicliffe, 1998). Table 12.1 shows the number of conversational units heard at animal exhibits from groups of boys with a formal educator and from groups of girls with a educator or other adult. The results are examined for the two categories, groups with only boy pupils and those with only girls

Table 12.1

Numbers of Conversational Exchanges Collected From Groups With Boys Only and Girls-Only at Three Types of Animal Exhibit

type of animal exhibit	total no of exchanges for all groups	Number of exchanges for groups with boys only	Number of exchanges for groups with girls only
Live animals at zoo	459	158	119
Preserved animals in Natural History Museum	407	184	104
Robotic animals in Museum	422	144	89

There was a total of 182 conversational units collected at zoo animals from mixed groups with both genders of pupils. The number of conversations of only boy groups were 158 and those of only girls 119. The total number of conversational exchanges in the Natural History Museum was 407 of which 184 were from groups with only boy pupils and 104 from the groups with only girls. The groups at robotic animal exhibits generated a total of 422 conversational units of which 144 were from groups with only boys and 89 from those containing only girls.

The conversational content for the transcribed conversational exchanges at the exhibits were worked out for each type of animal exhibit. The data are presented in turn beginning with those from the zoo (Table 12.2—Table 12.6).

Table 12.2

Comparison of Main Comments in conversations in Zoo of Gender Subordinate groups of School Groups - Main topics

Conversational category	School group n = 459 no %	Boys only n = 158 no %	Girls n = 119 no %	1 df (totals of sub-groups)	Probability	Phi^2
Man/social	354 77	113 72	82 69	0.22		
Exhibit access	289 63	94 60	68 57	0.15		
Other exhibit comments[a]	227 50	74 47	55 46	0.01		
All body parts	280 61	87 55	61 51	0.39		
Al behaviour	301 66	94 60	90 76	7.93	p<0.005	0.03
All names	401 87	142 90	96 81	4.75	p<0.01	0.02
Affective attitudes	193 42	66 42	42 35	1.20		
emotive attitudes	143 31	27 17	37 31	7.49	p<0.01	0.03
Interpretative comments	443 97	154 98	113 95	1.23		
real/alive	41 9	8 5	3 3	0.11		
knowledge source	254 55	82 52	58 49	0.27		
Environment	19 4	9 6	5 4	N/A[b]		

[a]. comments about smelling, hearing or touching the exhibits (including pushing buttons) or wanting to use another sense, particularly touch, and when child talked to the exhibit, other thing in the exhibit such as foliage and the mention of labels

[b]. N/A = not applicable because of insufficient data. . For 2 x 2 tables, the expected values in each in each cell should be 10 or more therefore it is inappropriate to use a chi square test on the data.

[c]. Phi is used as an measure of the strength of association between two samples. It ranges from 0 to 1 and if there is no association the value of Phi for the given data is 0. Phi is used to indicate the strength of association and the maximum value would be when there is a perfect association between the two variables. Whilst not strong enough for planning purposes the highest Phi values are the ones commented upon in the discussion.

Table 12.3

Comparison of Content of Conversations of the Gender Subgroups of the School Parties at the Traditional Animal Specimens in the Natural History Museum

Category of conversation	School groups n=407		Boys n = 184 no %		Girls n = 104 no %		1df	Probability Phi^2
Management/social	270	66	123	67	54	52	6.25	p<0.025 0.02

Exhibit access	219	54	102	55	40	39	7.66	p<0.01 0.03
Other exhibit	220	54	91	50	45	43	1.02	
All body parts	243	60	117	64	53	51	4.38	p<0.05 0.02
All behaviour	152	37	54	30	41	39	3.05	
All naming	344	85	154	84	84	81	0.40	
Affective attitudes	219	39	88	48	67	64	7.36	p<0.01 0.03
emotive comments	145	36	45	25	45	43	10.95	p<0.005 0.03
Interpretative comments	395	97	117	96	101	97	N/A	
knowledge source	296	73	124	67	72	69	.130	
real/alive	46	11	24	13	15	14	0.11	
Environment	45	11	12	15	13	13	2.93	

Table 12.4

The Content of Conversations of the Gender Subgroups of a School Party Visiting Static (Museum) Animal Specimens-Animal Focused Categories - Animal Observations

Category of conversation	All school groups n=407 no	%	Boys n = 184 no	%	girls n =104 no	%	__–_1df (totals of subgroups)	Probab-ility	Phi2
All body parts	243	60	117	64	53	51	4.38	p<0.05	0.02
front end	67	17	29	16	16	15	0.007		
dimensions	198	47	94	51	42	40	3.05		
unfamiliar	67	17	23	12	4	4	5.86	p<0.25	0.02
disrupters	39	10	16	9	12	12	0.6		
All behaviour	152	37	54	30	41	39	3.05		
Position	69	17	21	11	19	18	2.61		
movement	40	10	13	7	12	12	1.68		
food related	18	4	5	3	6	6	N/A		
attractors	63	16	19	10	16	15	1.59		
All naming	344	85	154	84	84	81	0.40		
Identity	297	73	134	73	71	68	0.67		
category	232	57	103	56	56	54	0.12		
Compare	164	40	48	26	20	19	1.73		
Mistake	23	6	14	8	4	4	N/A		

Table 12.5

Content of Conversations of Gender Subgroups within School Groups at Robotic Animals-Animal Observations

Category of conversations	School groups n=422 no	%	Boys only n = 144 no	%	Girls only n = 89 no	%	__——1df (totals of subgroups)	Probability	Phi2
Management/social	304	72	94	65	59	66	0. 03		
Exhibit access	239	57	80	56	39	44	2.63		
Other exhibit	173	41	73	51	40	43	0.73		
Body parts	309	73	96	67	65	73	1.04		
Behaviour	363	86	126	88	70	79	3.22		
Naming	176	42	66	46	22	25	10.43	p<0.005	0.05
Affective attitudes	229	63	82	57	55	62	0.53		
emotive comments	199	47	58	40	44	49	1.88		
Interpretative comments	400	95	139	97	81	91	3.18		
knowledge source	339	80	110	76	67	75	0.04		
real/alive	170	40	54	38	31	34	0.16		
Environment	19	5	8	6	4	5	N/A		

Table 12.6

Content of Conversation of the Gender Groups at Robotic Animals (Animated Models)- Animal Focused

Category	All conversations n=422		Boys n = 144		Girls n = 89		1df	Proba-bility	Phi2
	no	%	no	%	no	%			
All body parts	309	73	96	67	65	73	1.04		
front end	113	27	31	22	22	25	0.32		
dimensions	173	41	59	41	36	41	0.01		
unfamiliar	59	14	7	5	15	17	N/A		
disrupters	162	38	48	33	29	33	0.0.1		
All behaviour	363	66	126	88	70	79	3.22		
position	80	19	30	21	11	12	2.72		
movement	249	59	82	57	41	46	2.61		
food related	127	30	43	30	18	22	2.64		
attractors	182	43	60	42	35	39	0.12		
All naming	176	42	66	46	22	25	10.40	p<0.0052	0.05
identity	147	35	54	38	19	21	6.67	p<0.01	0.03
category	85	20	30	21	12	14	2.01		
compare	41	10	15	10	8	9	N/A		
mistake	6	1	3	2	2	2	N/A		

The data generated at the live animals by school groups of boys-only or girls-only are remarkably similar. However, boys named animals in some way more often but girl- only groups expressed emotive attitudes in more conversational exchanges and commented significantly more about observed behaviours.

The following conversations occurred from girls of Year 6 in an Invertebrate House. The first at a display of ants which included food, teddy bears and a picnic hamper as part of the exhibit furniture, the second at an aquarium; the third at an exhibit set in a dirty kitchen thus proving identifiable contexts.

Conversation 1: Ant Display

Girl: Oh look! Teddy bears.

Girl: Giant ants.

Girl: Look they (the things) are smothered in ants

Girl: It makes me itch!

Conversation 2: Aquarium

Girl: Is there anything in here?

Adult: Let's look. Oh yes, there is a leech!

Girl: A leech! Oh! Yes.

Conversation 3: Kitchen Exhibit

Girl: Ugh! Uck!

Girl 2: Cockroaches.

Girl: I don't like any of them.

Girl: Hum.

Girl 3: They have eaten all the inside of the apple.

Examples of conversation generated by groups of younger pupils are as follows. Note the affective response from the groups of girls .

Conversation 4

Penguins (4 to 5 year olds with a educator)

Girl: Ah!

Educator: What colour are they?

Girl: Black and white.

Educator: What are they covered by?

Girl: Feathers.

Girl 2: I can't see.

There is remarkable consistency in comments generated in the three main categories of animal observations, anatomy or body parts, behaviour, and naming. Whilst individual categories have yielded no significant difference within the naming super ordinate category the accumulative results shows that girl-only groups refer to names less than do boy-only groups. Groups with girls only generated significantly more 'emotive attitudes'- likes and dislikes, ‘Ahs’, ‘Ughs’, and ‘Ohs’ as in conversation 3, and comment significantly more about behaviour of the animals. In summary, at zoo animals, groups with only-boys name the animals, as in conversation 5, significantly more than groups with only-girls.

Museum animals are a different type of exhibit because the animals are static. These exhibits have been prepared from skins of animals and are different from live animals as exhibits in that:

- they can be seen;
- their presence is predictable;
- the behaviour they are portraying i.e. feeding, fighting, is predictable;
- visitors can look for as long as they choose;
- a strong and easily recognised story line or message can be given by the museum and received by the visitors;
- environmental features- habitat etc. can be shown clearly

Furthermore, dioramas, which are effectively scene at a moment in time, can show animal interactions - predator prey, male female, parental care etc. behaviours, which are not possible in zoos! Dioramas can clearly show the ecosystem and the food chain, concepts not usually shown with live animals unless it is accidental where a non-captive animal enters an enclosure and is devoured. I have witnessed tigers enter such pigeon entrants and otter eating sparrows.

Some differences between the content of the conversations generated at live animals and at the museum animals is to be expected. However, this difference might be for both genders or it may be for only one. These data indicate some significant differences in conversational content. Boy-only groups had more conversations with at least one management or social comment, pointing out the animal or referring to it and mentioning significantly more anatomical aspects of the specimens. Groups with only girls generated significantly more conversations which contained affective attitudes including emotive comments such as 'Oh!' and expressions of like and dislike as in conversation 6.

The following exchange between Year 6 girls shows the more pronounced emotive emphasis characteristic of conversations of some groups of girls. They were looking at different species of dog.

Conversation 6

Girl: Oh, aren't they cute?

Girl 2: Aren't they gorgeous?

Girl: Oh my God!

Girl 2: Oh I love doggies.

Girl: Oh look at that one. Aren't they cuddly? They're lovely.

Girl 3: That is cruel. I don't like that.

Girl: I like the big one.

Girl 2: It looks like it's been stuffed.

The conversation is a commentary. The speakers respond with positive emotions to the images of the dogs but also recoil at the imagined treatment of the dogs in being preserved (an affective comment but not an emotive one).

The following conversations between a group of Year 6 boys illustrates the emphasis on body parts made by groups with only male pupils at the variety of animal exhibit at the entrance of a Gallery.

Conversation 7:

Boy: That doesn't have any legs .

Boy: That has 8 legs there 4 legs there and no legs there.

Boy: Stick the groups' name.

Boy 2 : Oh yes.

Unlike the responses to the zoo animals, pupils at the museum animals held more conversations with at least one comment about body parts in general and unfamiliar parts in particular nor was there a significant difference in naming between the two groups of only boys and only girls.

At Museum animals, the groups with only boys 'found' the specimens. They generated more management commands, make more social responses to each other and found the cases or located the specimens and items of interest without the exhibit. The boys mentioned body parts significantly more as part of the 'Look- see that' sequence. Girls generated more affective and emotive comments.

Robotic animals are relatively frequent recent additions to the repertoire of animals as exhibits, which appeared in the last decade of the20th. Of the two exhibits studied, one as located half way through a Dinosaur Gallery and one at the exit (In one exhibit the specimen was unnamed, hence the number of names that can be used is much reduced compared with the opportunities for naming a variety of species for museum and zoo animals. Moreover, the different nature of the robotic animals, whose movements are planned and sequenced, elicits a

different emphasis in the responses. The predictability of the movement of the robotics is an important feature which differentiates such exhibits from the static museum animals and the potentially, but unprofitable, moving zoo animals. Predicting the next action is illustrated in as in the following dialogue (Conversation 8).

Conversation 8:

Boy: I have had enough.

Girl: I haven't done this yet.

Girl: That dinosaur that they are eating he looks really, really nice. The head will go up in a minute.

The data show that the only category mentioned in significantly more conversations was that of naming and it was, counter intuitively, done so by boys. The following typical boy only (Conversation 9) illustrates the use of names.

Conversation 9:

Boy: It move sometimes, look!

Boy: I know that's *Tyrannosaurus rex.*

Boy: Wow, wow!

Boy: They eat that one, that big dinosaurs that ,…that dinosaur is moving.

Boy: Yes I know.

Girls are less concerned with naming and more with emotive comments.

Conversation 10:

Girls: Look! Ah! Look!

Girls: Its leg is moving, look down there the big one keeps moving.

Girl: But it's dead!

Girl: I want to hear the roar again I want to hear the roar again!

Boys made more emotive comments at these animal exhibits than they did at the zoo and the museum animals. They responded emotively to the story being told through the diorama exhibit of meat eaters eating the plant eater and name the species (Conversation 11).

Conversation 11:

Boy: Ugh! Look at that thing.

Boy: This is a *Terantosaurus.*

At the robotic animals the groups of boys name the dinosaurs significantly more and gave them an identity name, such as '*Tyrannosaurus*'.

Discussion and implications

Nearly all groups had a female adult with them, or were alone with their own gender, so the adult-effect, noted by Diamond (1986) for family groups, was similar for chaperoned groups. We do not know if the comments of boy-only groups are different because of their response to female educators and chaperones or of their inherent interest. Moreover, we do not know the effect of male chaperones and educators on the content of conversations of all groups. It may be that the perceived role of gender influences preference by the pupils for participation in particular activities. From the content and form of the conversations reported it appears that little ‘science’ is discovered or ‘science talk’ (Lemke, 1990) constructed. Everyday comments and conversational form predominate even though these are school visits.

The novelty of exhibits attracts both boys and girls (Koran & Longino, 1986). This novelty factor is an influence in responses to the robotic animal exhibits. Differences between the gender responses similar to those elicited at other types of animal exhibit are not present except for the greater number of conversations generated by only-boy groups who name an animal.

Overall, the response of boy-only groups to animal exhibits emerges as one that is more factual—categorising and looking. Girls, on the other hand, are overall more concerned with their feelings and concerns and their relationships with specimens. An illustration of this phenomenon was recorded at specimens of domestic dog in the museum, (Conversation 12).

Conversation 12:

Girl: Oh, aren't they cute?

Girl 2: Aren't they gorgeous?

Girl: Oh my God!

Girl 2: Oh I love doggies!

Girl: Oh look at that one. Aren't they cuddly? They're lovely.

Girl 3: That is cruel. I don't like that.

Girl: I like the big one.

Girl 2: It looks like it's been stuffed.

The emotional response to animals' colours most oaten in a context, which is familiar, or which the pupils can imagine such a stem pet dog or a kitchen setting with added cockroaches.

The greater emotive response by girls to the animals illustrates the point that girls and boys do develop different ways of responding to the world and bears out the folk lore. From a relatively early age boys want more facts and girls are more concerned about emotions, for example, eight year old boys ask for facts about babies and toddlers developing, whereas girls are exploring feelings and emotions (Tunnicliffe, 1997).

Overall, similar aspects of animals as exhibits catch the attention of school groups (Tunnicliffe, 1996a). Response varies with age of the children (Tunnicliffe, 1996b). Furthermore, there is a gender specific response in some areas. Girls comment on their likes and dislikes and

mention feelings, both theirs and the animals'; whereas boy-only groups are more interested in establishing the data about the animals. The data presented in this paper indicate that boys respond differently to animal exhibits unless they are looking at a novel one. Robotic dinosaurs elicit similar comments from all groups except, even so, the need of boy-only groups to categorise and identify what is being looked at is still apparent. It is interesting that there are so few differences in the conversational content of boys and girls. This finding supports the practice of providing similar work about animals in school and in museums and zoos.

Implications

Pre-service Teachers

The implication of the data reported in this chapter about learners in informal settings as opposed to the classroom is for educators, and hence a crucial part of pre-service educator training. A formal educator organising such a learning opportunity, which usually has a relation to some topic at school, should identify which part of the ‘learning trilogy’ the anticipated visit belongs. Is it an introduction to subject, or designed to supplement the learning about a specific topic in the middle of the learning sequence or as a summative visit at the end? The relationship to the trilogy should be very clear as it relates to the aims and objectives of such a visit and their expected learning outcomes. The pre-service educator should develop his or her own assessment tool for use at whatever stage of the learning trilogy. The formal educator planning a visit to an informal location should be aware of the learning style and references of the students in their charge. Pre-service educators should seek the advice and knowledge of the formal and informal educator and consider the design of activities accordingly.

Learning for Boys and Girls

There are differences in the responses of boys and girls to the same exhibit, and indeed, in my experience to the cultural heritage of the learner. For example, informal educators might help boys reflect on more affective aspects of the animal exhibits and help girls to name the specimens to a greater extent. Data here also challenge informal educators to be aware of gender specific differences that are identifiable in the conversations of boys and girls as single sexed groups and even the comments which they make when part of mixed sex groups. The venues can assist in the interpretation provided, on briefing sheets for chaperones with questions being posed at exhibits by groups or through facilitators. Pre-visit discussion of the issues in both in-service education and in the educators' packs would be useful. Suggestions for cue questions to be posed to learners are an important part of preparation for an effective learning outcome. These are also invaluable in the briefing of chaperones in their task accompanying learning groups.

Final Thoughts

These studies of English primary pupils and their accompanying adults indicate that there is a similar basic interest held by English educated learners of primary age. Moreover, their pattern of responding to animals as exhibits has only a few significant variations. The insight gained into the preferences of the pupils of the two genders obtained from this study will be of use to both school educators and museum educators in England and serve as a baseline for further studies and as a guide to those in other countries. The knowledge could enable all educators involved in out of school visits to emphasize the relevant areas of the specimens which are given less focus by the groups and to build upon that to which the pupils do attend.

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