

## PERTH SCIENCE FESTIVAL 2016

### Evaluation of the World Biotechnology Tour via the Perth Science Festival Exit Survey

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The Perth Science Festival ran over Saturday and Sunday, August 13 and 14, 2016 in the Perth Cultural Centre. A large marquee labelled with the World Biotech Tour housed a range of activities and exhibits relating to biotechnology, including the Lab-in-a-Box Activities run mainly by Scitech staff, pairs of Ambassadors discussing their projects, and several other essentially hands-on displays.

The *Perth Science Festival Exit Survey* was designed to gather visitors' overall impressions of their experience as it related to biotechnology. The survey comprised three sections:

1. Attitudes. Seven word pairs of opposite meaning (such as educational and non-educational) were separated by a row of seven boxes. Visitors were asked to mark a box "at the position which fits how you thought about your experience".
2. Personal Perceptions. Three rating scales items asked about visitors' previous knowledge of biotechnology, if they thought they had learned anything new about biotechnology, and how surprised they were at how much biotechnology is part of everyday life.
3. Demographics. Three items asking visitors to check boxes to indicate their age group, their sex, and why they came to the event.

The contents of the survey were discussed with Scitech staff and it was field-tested by one of the researchers to make sure that the choice of words and format of response were readily understandable by visitors. A copy of the *Exit Survey* is included as an Appendix.

Two to four researchers attended each day of the Perth Festival, taking field notes of visitors' behaviour, observing visitors who interacted with the Lab-in-the-Box Activities and interviewing the presenters of the non-Scitech exhibits about their satisfaction with their participation. Usually at least two researchers administered exit surveys as visitors left the marquee. People were simply asked if they would assist by completing the survey about their experience and refusals were rare. An attempt was made to collect data from the full range of age groups (from about 10 years up), and from both males and females. Over the two days, 318 surveys were completed exceeding the set target of 100 surveys.

#### *Visitor Demographics*

As shown in Figure 1, the majority of visitors completing the survey were either children up to 12 years of age (28%), or adults in the 26 to 45 year age group (46%), usually their parents and/or grandparents. There were few teenagers and young adults (13% overall) even though efforts had been made to have them complete surveys; visitors of this age were not well-represented at the Festival. Figure 2 shows that 41% of respondents were male. These demographics seemed to be fairly typical of the population observed visiting this marquee at the Perth festival, although there was no way of checking this.

In addition, visitors were asked why they attended the event, and congruent with the above results, the large majority (84%) of the 201 adults (19 years and over) who responded came to bring children and all of the children aged up to 12 years were in family groups. The other adults (16%) came for their own education/entertainment and with friends.

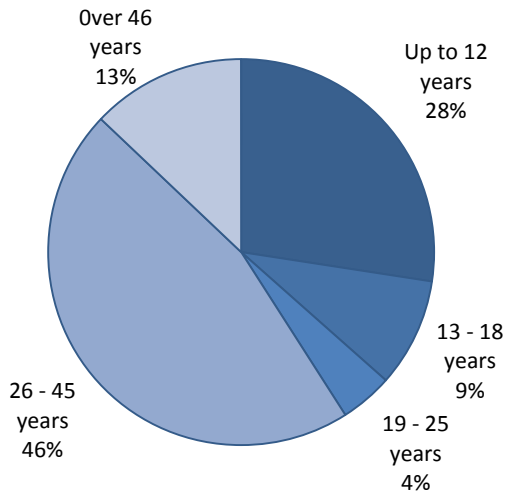


Figure 1. Age distribution of respondents (n = 317)

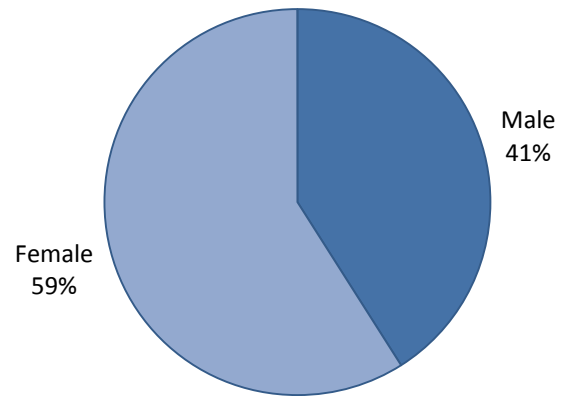


Figure 2. Sex distribution of respondents (n = 300)

### Analysis of the *Perth Science Festival Exit Survey Items*

#### *Attitude Items*

Each of the seven paired response items was scored 1 through 7, according to which box was marked, so that the most positive response was scored 7 and the least positive was scored 1. Means and standard deviations were calculated and these results are reported in Table 1, where the item content is arranged with the more positive words on the right.

Table 1. Number of Responses, Means and Standard Deviations for Attitude Items of the *Perth Science Festival Exit Survey*

Item	Item word pairs	N of responses	Mean	Standard Deviation
1	Non-educational – Educational	317	6.26	1.16
2	Uninformative – Informative	317	6.26	1.10
3	Superficial – Detailed	313	5.31	1.70
4	Not interesting – Interesting	318	6.39	0.85
5	Unpleasant – Enjoyable	317	6.34	0.97
6	Uninspiring – Inspiring	317	5.69	1.64
7	Not relevant to me – Relevant to me	317	5.33	1.60

Note. The number of visitors responding to each item varied between 313 and 318.

The results shown in Table 1 are very positive. The maximum score is 7, and four of the seven items have means exceeding 6. Three items (Item 3, Superficial – Detailed, Item 6, Uninspiring – Inspiring and Item 7, Not relevant to me – Relevant to me) have means less than 6 and they also have the largest standard deviations, indicating a greater spread of responses. The spread of responses is shown visually in Figures 3 and 4, which provide bar charts of the percentage frequency distributions among the seven response choices, clustered according to whether the mean is over or under 6.00.

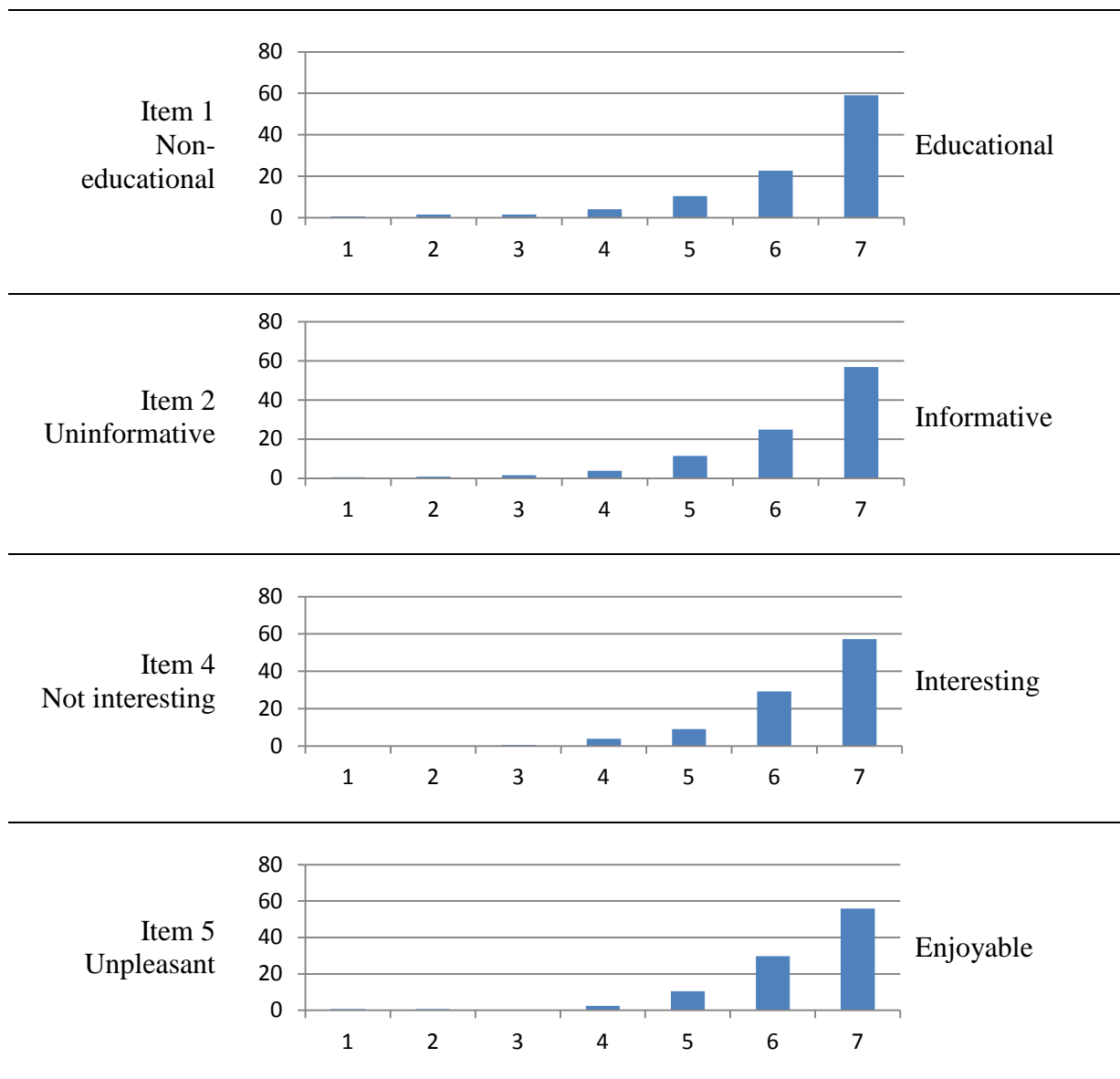


Figure 3. Percentage distribution of responses items with means over 6.00.

Figure 3 shows very similar patterns of responses for the four items, all of which refer in one way or another to positive attitudes about visitors' experience, in terms of whether they thought the exhibition was educationally worthwhile, interesting and they enjoyed themselves. Judging from verbal comments on the way out, the very few negative responses

were associated with the crowdedness of the marquee, with people unable to reach the displays easily.

In contrast, the three items shown in Figure 4 have a wider spread of responses even though they reflect a positive experience overall. These items refer more to the effect the experience has had on the visitor, and perhaps not surprisingly, visitors have been more circumspect about their personal responses.

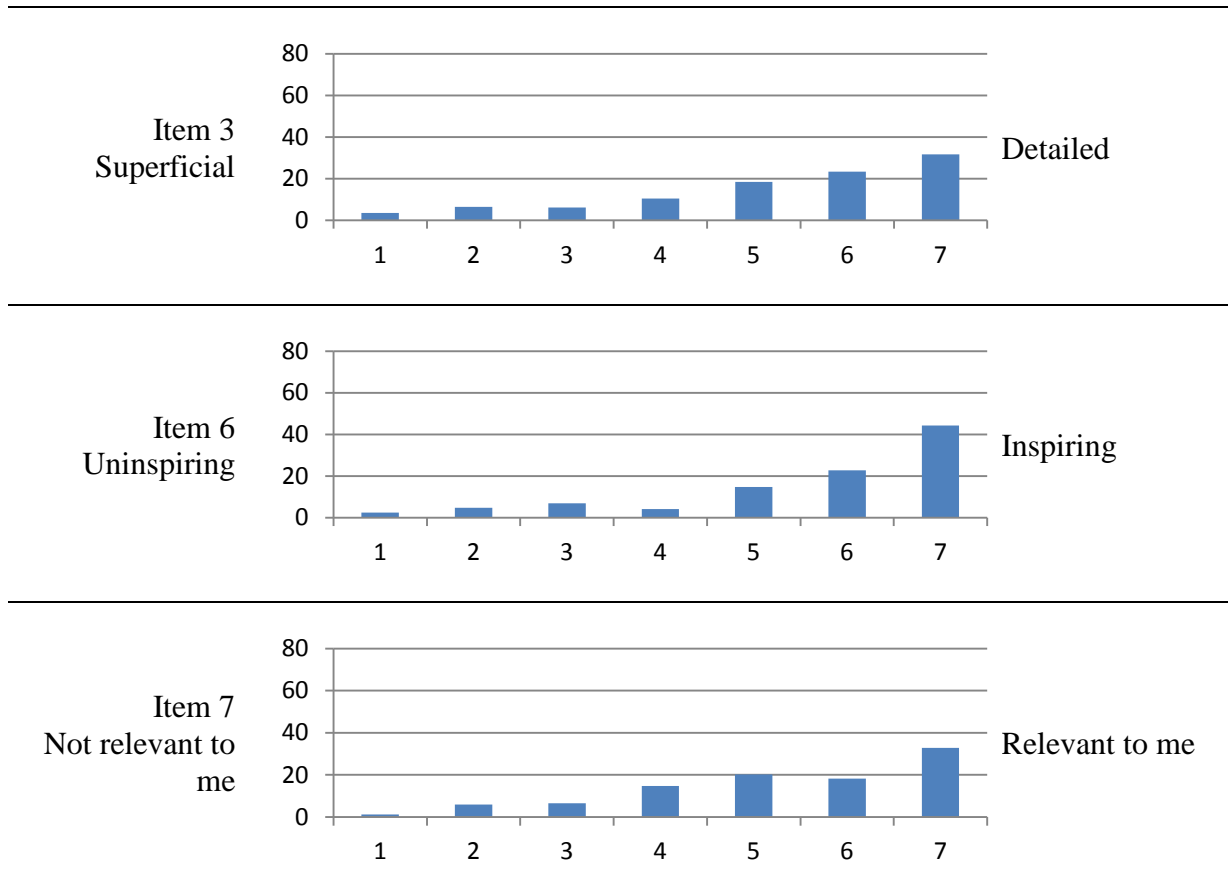


Figure 4. Percentage distribution of responses for with means over 5.00 but under 6.00

The pattern of responses to each of the paired response items was almost identical for males and females, but there was some variation across the different age groups. Figure 5 shows a line graph of the mean response scores for each age group over the seven items. There were few differences on the first four items with all groups having mean scores over 6.00, indicating that all age groups were positive about the educational value of the exhibits and enjoyment of their visit. However, teenagers (13 to 18 years) tended to be least positive about the level of detail (with a mean score close to 4.00, the midpoint of the scale), and whether they found it inspiring or thought it was relevant to them. Perhaps not surprisingly, the oldest age group found biotechnology least relevant to themselves.

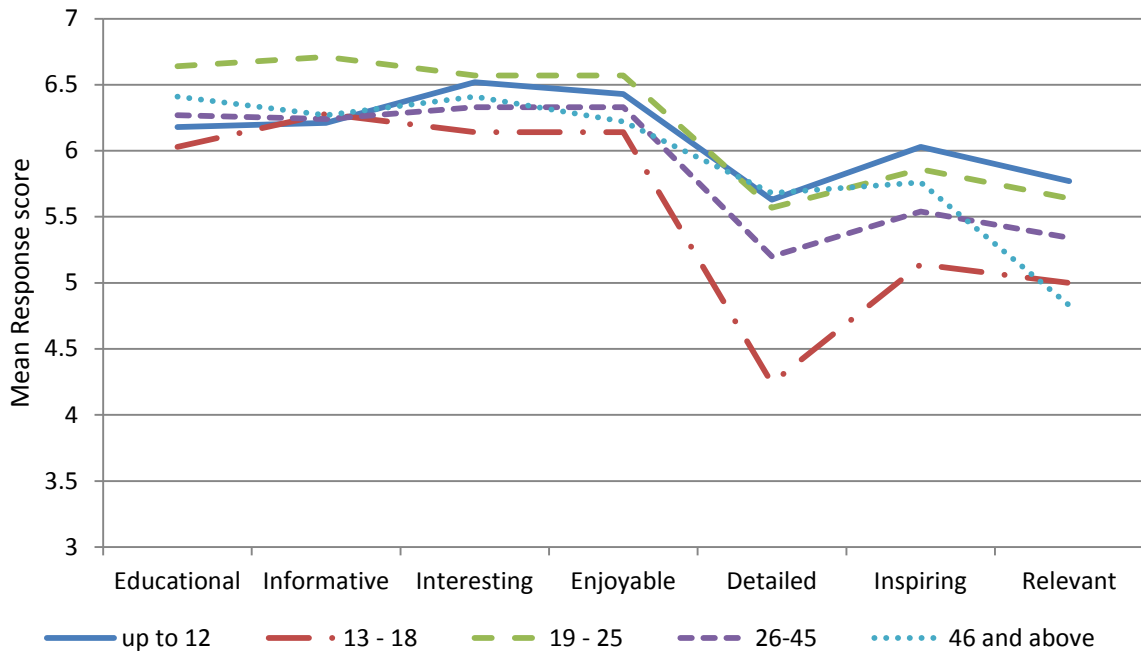


Figure 5. Distribution of mean response scores for different age groups

### Personal Perceptions about Technology

Three rating scale items asked about visitors’ perceptions of their previous knowledge of biotechnology, if they thought they had learned anything new about biotechnology, and how surprised they were at how much biotechnology is part of everyday life. Responses to these items were scored 1 (for the lowest response) to 5 (for the “a lot” responses). The results for these items are shown in Table 2 and the frequency responses are graphed in Figure 6.

Table 2. Frequency Responses (%), Means and Standard Deviations for Visitors’ Perceptions about Biotechnology

Item	Item Content	Hardly any	A little	Some	Quite a bit	A lot	Mean	SD
8	Did you have any previous knowledge of biotechnology?	24	35	28	9	4	2.36	1.07
9	Do you think you learned anything new about biotechnology today?	2	17	32	37	12	3.39	0.99
10	Were you surprised how much biotechnology is part of our everyday life?	8	14	20	41	17	3.44	1.16

Note. The number of visitors responding to each item varied between 315 and 317. The wording describing the first response choice varied slightly, reading “hardly any” for Item 8, “nothing new” for Item 9 and “not at all” for Item 10.

The responses for Item 8 in Table 2 and Figure 6 show that most visitors (59%) reported that they had “hardly any” or only “a little” previous knowledge about biotechnology. Only 4% felt they already knew “a lot” about biotechnology. In contrast, in response to Item 9, nearly half of visitors (49%) reported that they had learned “quite a bit” or “a lot” about biotechnology during their visit. The difference in these patterns is shown clearly in Figure 6. Analysis of the responses showed that 215 of the 317 visitors (68%) who responded to these two items gave a more positive rating to Item 9 than to Item 8. This can be interpreted as a positive result, as many of those visitors who felt they had “some”, “quite a bit” or “a lot” of previous knowledge about biotechnology, reported that they had learned something new.

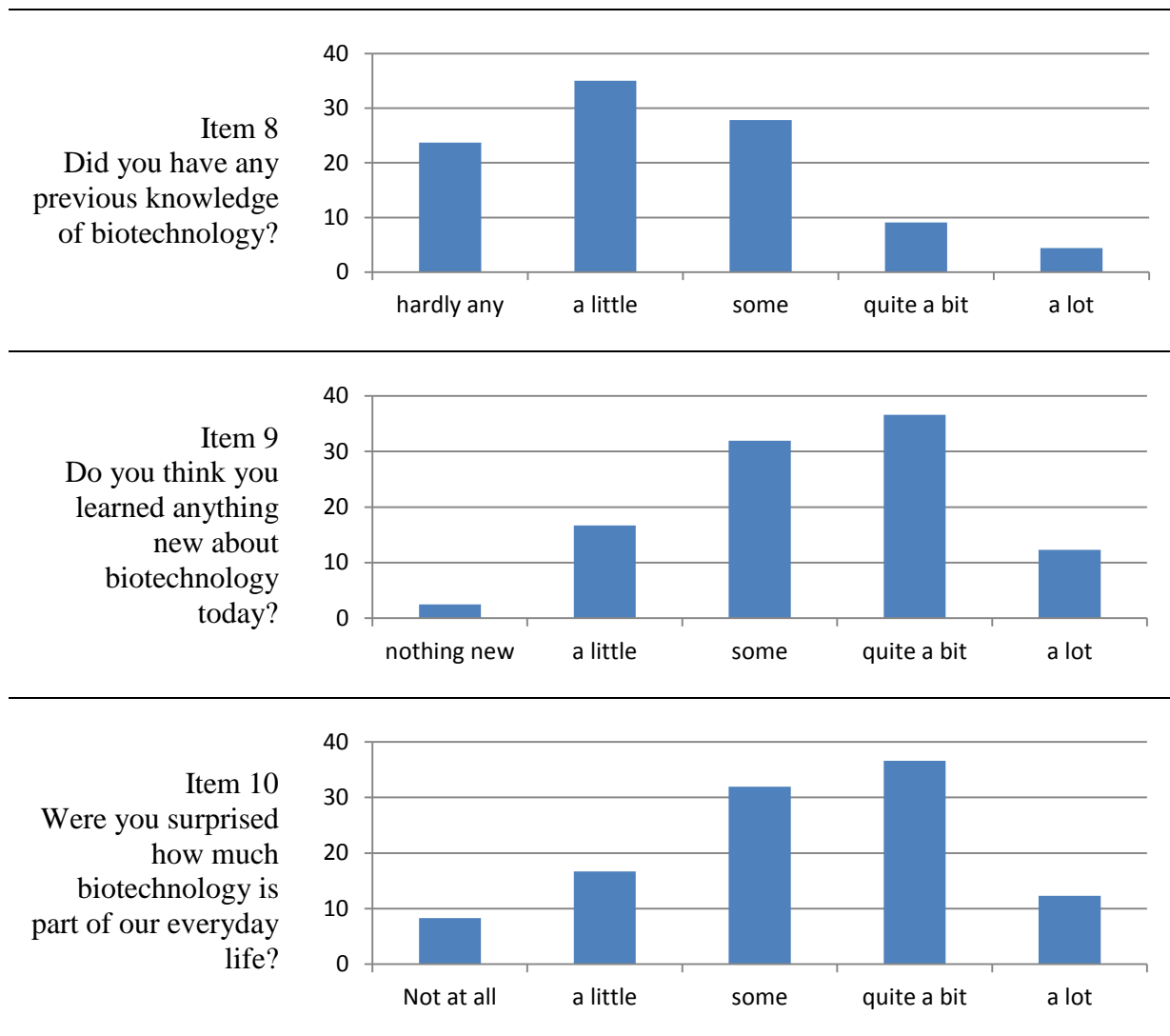


Figure 6. Percentage distribution of responses for Items 8 to 10

The final item shown in Figure 6 shows that a majority of visitors (58%) reported they were “quite a bit” or “a lot” surprised at the pervasiveness of biotechnology in our everyday life. This suggests that their experience with the exhibition broadened many visitors’ views about biotechnology.

There were variations in response to these three items from the different demographic groups. Females (mean score 2.25) were more likely to rate their previous knowledge lower than males (mean score 2.54) but both reported similar ratings in terms of having learned something new (females 3.39, males 3.37), or surprise at the pervasiveness of biotechnology (females 3.43, males 3.37).

There were also differences across age groups, as shown in Figure 7. The youngest group of visitors, children aged up to 12 years, rated their previous knowledge at around “a little” (scored 2) but responded most highly on Item 9, asking whether they had learned anything about technology on the day and Item 10, indicating surprise at the pervasiveness of biotechnology. Young adults (19-25 years) self-reported the highest level of previous knowledge (averaging a score of 3, corresponding to “some” knowledge) but still tended to report that they had learned “some” new knowledge, and were moderately surprised at how much biotechnology is in everyday life. The oldest group (46 years and above) reported the second highest level of previous knowledge, but were the least surprised.

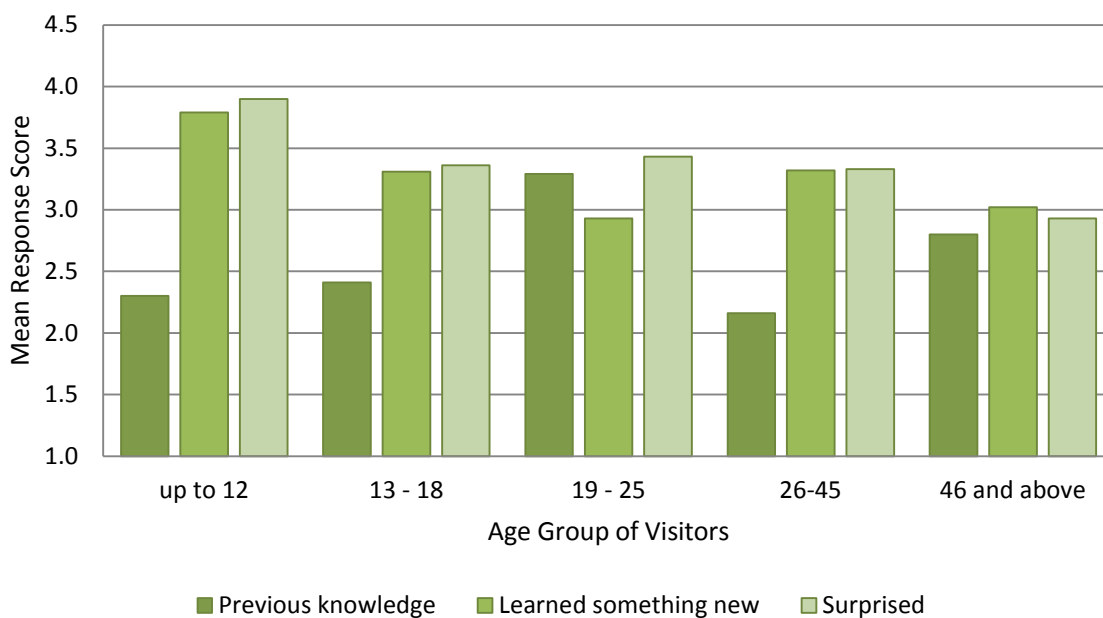


Figure 7. Distribution of mean response scores for different age groups on Item 8 (Level of previous knowledge), Item 9 (Did you learn anything new?) and Item 10 (Surprise at extent of biotechnology in everyday life).

## Summary

The results of the Perth Science Festival Exit Survey were very encouraging. The very positive responses on the first seven items relating to people’s attitudes indicate that they enjoyed themselves in the World Biotech Tour Marquee and believed the exhibits and their experiences were informative and educational. They also were positive about the effect on themselves, with many, particularly the younger children, feeling inspired and finding the exhibition relevant to them. The large majority of visitors reported that they had little previous knowledge about biotechnology and most felt they learned something new on the day. In addition, visitors stated they experienced surprise at the extent of biotechnology in everyday life. In all cases, the effect on children was the most positive.

## Appendix: The Perth Science Festival Exit Survey

### Please tell us about your impressions of this Biotechnology event

Put a tick in a box on **each** line at the position which fits how you thought about your experience.

	1	2	3	4	5	6	7	
<b>Educational</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Non-educational</b>
	1	2	3	4	5	6	7	
<b>Informative</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Uninformative</b>
	1	2	3	4	5	6	7	
<b>Superficial</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Detailed</b>
	1	2	3	4	5	6	7	
<b>Not interesting</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Interesting</b>
	1	2	3	4	5	6	7	
<b>Unpleasant</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Enjoyable</b>
	1	2	3	4	5	6	7	
<b>Inspiring</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Uninspiring</b>
	1	2	3	4	5	6	7	
<b>Relevant to me</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Not relevant to me</b>

For the following questions, please tick the box which is right for you.

**Did you have any previous knowledge of biotechnology?**

Hardly any     A little     Some     Quite a bit     A lot

**Do you think you learned anything new about biotechnology today?**

Nothing new     A little     Some     Quite a bit     A lot

**Were you surprised how much biotechnology is part of our everyday life?**

Not at all     A little     Some     Quite a bit     A lot

**What is your age in years?**

up to 12     13 to 18     19 to 25     26 to 45     46 and above

I am  male     female

**Why did you come to this event today?** (Please tick as many boxes as needed.)

My own entertainment/education     Bring children/ grandchildren     Bring friend(s)  
 Bring partner/spouse     Other. Please say why \_\_\_\_\_

**THANK YOU!**