CHAPTER 7
VISITOR AWARENESS AND UNDERSTANDING

Visitors examining artefacts on a touch table in Adelaide Zoo.

Education is simply the soul of a society as it passes from one generation to another.
Gilbert K. Chesterton, English journalist and novelist (1874-1936).
The Observer, 1924.
As mentioned in Chapter 4, zoos are unique institutions where people retain memories of their previous experiences, often vividly recalling events of personal appeal and developing an ongoing interest that may have been initiated many years previously. John Dewey (1938) referred to these experiences as ‘educative’ (p. 13) when he expressed the belief that ‘all genuine education comes through experience’ (p. 25). From this simply stated notion, it becomes apparent that to enable visitors to grow and learn from their time in the zoo it is essential that they understand their viewing experiences sufficiently and construct meanings from these encounters. Either directly or indirectly, zoos offer their viewing public an informal education. Settings are provided in which learning can be facilitated incidentally and where there is an opportunity to learn, based upon visitors’ individual interests and ability to construct meanings as they choose their own activities. Screven (1996) explained that the information learned from an exhibit depended upon the connections made between what was actually observed and the perceived usefulness of the information received. Unlike the formality of schools, zoos are informal settings where attendance is purely voluntary, the importance of learning is not prescribed and there is little if any control over the viewers. Visitors can wander at will, watching what they fancy, spending as much time as they wish, without having to connect to any prior knowledge or experience. Most importantly, they look at animals kept in a variety of exhibits, without the benefit of teachers to explain or interpret different activities and behaviours observed.

It has been demonstrated that the main reasons people visited the zoo revolved around their aim of having a pleasurable day out, with a mind-set of looking at animals, rather than learning about any patterns of behaviour, specific features or individual characteristics. Despite these recreational motivations, visitors considered education was the most important component of the zoo’s mission statement. The work discussed in this chapter focuses on two factors which attracted and influenced the awareness of viewers and which consequently had the potential to develop understanding and improve their knowledge of the animals seen in the zoo. The use visitors made of the various signs and labels at the different exhibits was considered by observing the reading patterns of viewers. The visitors’ awareness of the use of different enrichment items supplied for the well-being of the animals was explored. To develop an appreciation of the ways in which visitors viewed one aspect of animal welfare, their thoughts relating to the hypothetical suggestion of feeding live prey to carnivores kept in captivity were investigated.
Many people visited the zoo with expectations that had been formulated and developed from much-liked traditions. A reflection of one way in which animals have been represented in popular culture was witnessed with the release of *The March of the Penguins*, winner of the Academy Award Best Documentary in 2005. Apart from the contrasts in approach between the English and French versions, at the time of its release this film was seen as having an overly romantic viewpoint; yet it was even suggested that it provided evidence for ‘intelligent design’. The opinions evoked by this film typified the broad range of opinions and interpretations that apply to visitors to the zoo.

The way in which zoos have displayed animals for the visiting public has directly affected popular opinion about wild creatures. Hancocks (2001:249) found that quite often visitors did not perceive animals in the zoo as wild animals, simply because they were not presented as ‘wild’. Often, animals have been exhibited in enclosures with a plethora of posts, artificial equipment, concrete structures and other paraphernalia that destroy any semblance of a wild environment (Plate 7.2). Amidst such confused and perplexing images, it is not surprising that the likelihood existed for visitors to develop confused ideas and attitudes in relation to the animals held in the zoo.

Plate 7.2: Artificial climbing structures in the orang-utan enclosure at Taronga. Visitors perceived these structures as being ‘too artificial’ and consequently considered the enclosure as ‘unnatural’.
Modern zoos have multiple functions which involve recreation, education, conservation and research. Although people visited the zoo for recreational purposes, this work confirmed that visitors expected more from their day at the zoo than simply staring passively at an exotic animal. Visitors valued the zoo highly and perceived it as a centre for conservation, and they also expected some form of education as well as entertainment. The framework of the zoo allowed viewers the opportunity to weave fragmented pieces of information into an integrated, meaningful experience, which led to development of their learning.

The data required for the statistical analysis in this chapter was gained from observations made during the tracking analysis combined with the responses given to both closed and open questions in surveys. The results made it possible to ascertain features which actually attracted the attention of viewers, from which they were able to develop their awareness and understanding. To characterise the responses of visitors to the different signs, two behavioural measures were considered; specifically the attraction power (the percentage of visitors who actually read the signs) and the holding power (the amount of time visitors spent looking at the signs), using the formulae set out in Chapter 3. The results compared the times visitors thought they had spent reading with the actual times they spent reading the different signs. An attempt was made to determine whether visitors read signage simply to ascertain the name of the particular animal, or if they actually read any additional information (Plate 7.3). The different ways in which visitors considered that the labels could be improved were also explored.

Plate 7.3: Viewers at the meerkat enclosure at Taronga, where larger, new style signage provided more information for visitors than the smaller, old style sign.
7.1 Signs and labels

One of the greatest strengths that zoos possess is the potential to offer their visitors an enjoyable learning experience, something which can be enhanced by the quality of the signs and labels at different exhibits. Exhibitions have been recognised as ‘one of the principal ways that a museum or institution communicates with its public’ (Spencer, 1999:156). The signs and labels at an exhibit form an intrinsic part of providing this experience by communicating a message to viewers, sometimes even being placed on a par with the exhibit itself (Ekarv, 1999). Reading exhibit signage is an important aspect of any educational benefit visitors might gain from stopping to look at the different exhibits in the zoo. Studies have shown that the majority of people who visit museums do not read the signs and labels (Brennan, 1977), and since visitors to the zoo only read signs when they feel inclined, the potential to receive a benefit can be either totally ignored or greatly enhanced. Since signs may be the only means of interpretation and communication available, it can be assumed that when visitors fail to read the material available, they have not experienced the full impact of the exhibit, particularly since the signs may be the only means of interpretation and communication (Broad, 1996). All the exhibits, in both zoos, had signs that were positioned mostly near the front of the enclosures. These identifying and descriptive signs mostly contained brief captions with a graphic representation of the animal. They were intended to provide basic information, but they might also provide some further reference to endangered species and the conservation of animals (Plates 7.4, 7.5).

Plate 7.4: Sign at aviary, typical of general signage at Taronga Zoo.
Plate 7.5: Sign at penguin enclosure, typical of general signage at Adelaide Zoo.

Signs and labels are a powerful communication resource that needs to be understood as fully as possible (Ravelli, 2006:1). There is no accepted definition of what constitutes a successful sign in a zoo, and opinion has differed widely in this regard. There are no systematic methods currently in use in zoos to measure the success of signage and no standards for making comparisons between the different forms of graphics. What makes a sign ‘good’ tends to be based upon subjective opinion, rather than on any concrete criteria. Every exhibit in Adelaide and Taronga zoos displayed at least one identifying sign. These signs ranged from simple identifying labels to more descriptive and informative ones. As such they represented one method by which information could be communicated to visitors (Falk & Dierking, 2000:7). Although this communication is inherently complex (Halliday & Matthiessen, 2004) and there are many variables associated with individual appreciation of different signs, this research examined the use visitors made of the signage and provided a quantitative method to determine visitor appreciation of the graphics.
7.1.1 Reading of signage

Using the formulae described in Chapter 3, the attracting and holding power of the labels at different exhibits in the two zoos were determined. The results, listed in Tables 7.1 and 7.2, showed that overall there was no significant difference in the reading times of signs in the two zoos and that 8.4% of visitors actually stopped and read the signs at the different exhibits, reading for an average of 11 seconds (Table 7.3). With the exception of the labels at the new enclosures (which are discussed later), the attracting power ranged between 2% and 15%. It was apparent that several visitors appeared to read ‘on the run’ and did not stop, taking just a quick glance as they moved past the label, presumably simply to ascertain the name of the animal on display or its country of origin.

<table>
<thead>
<tr>
<th>Exhibit</th>
<th>Number of Visitors</th>
<th>Visitors who Read</th>
<th>Attracting Power %</th>
<th>Mean Time (secs)</th>
<th>Holding Power %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaver</td>
<td>118</td>
<td>2</td>
<td>1.7</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Tiger (old)</td>
<td>187</td>
<td>6</td>
<td>3.2</td>
<td>6</td>
<td>43</td>
</tr>
<tr>
<td>Giraffe</td>
<td>173</td>
<td>6</td>
<td>3.5</td>
<td>7</td>
<td>41</td>
</tr>
<tr>
<td>Wombat</td>
<td>103</td>
<td>4</td>
<td>3.9</td>
<td>7</td>
<td>50</td>
</tr>
<tr>
<td>Barbary sheep</td>
<td>50</td>
<td>2</td>
<td>4.0</td>
<td>9</td>
<td>75</td>
</tr>
<tr>
<td>Orang-utan (old)</td>
<td>200</td>
<td>9</td>
<td>4.5</td>
<td>7</td>
<td>44</td>
</tr>
<tr>
<td>Zebra</td>
<td>195</td>
<td>9</td>
<td>4.6</td>
<td>11</td>
<td>46</td>
</tr>
<tr>
<td>Otter</td>
<td>210</td>
<td>10</td>
<td>4.8</td>
<td>7</td>
<td>50</td>
</tr>
<tr>
<td>Siamang</td>
<td>209</td>
<td>10</td>
<td>4.8</td>
<td>8</td>
<td>57</td>
</tr>
<tr>
<td>Seal</td>
<td>173</td>
<td>13</td>
<td>7.5</td>
<td>19</td>
<td>42</td>
</tr>
<tr>
<td>Flamingo</td>
<td>257</td>
<td>20</td>
<td>7.8</td>
<td>8</td>
<td>32</td>
</tr>
<tr>
<td>Penguin</td>
<td>268</td>
<td>22</td>
<td>8.2</td>
<td>8</td>
<td>31</td>
</tr>
<tr>
<td>Hippopotamus</td>
<td>190</td>
<td>16</td>
<td>8.4</td>
<td>13</td>
<td>48</td>
</tr>
<tr>
<td>Gorilla</td>
<td>183</td>
<td>18</td>
<td>9.8</td>
<td>11</td>
<td>42</td>
</tr>
<tr>
<td>Lion</td>
<td>200</td>
<td>22</td>
<td>11.0</td>
<td>14</td>
<td>33</td>
</tr>
<tr>
<td>Meerkat</td>
<td>105</td>
<td>12</td>
<td>11.4</td>
<td>10</td>
<td>56</td>
</tr>
<tr>
<td>Sun bear</td>
<td>173</td>
<td>20</td>
<td>11.6</td>
<td>7</td>
<td>32</td>
</tr>
<tr>
<td>Tiger (new)</td>
<td>249</td>
<td>61</td>
<td>24.5</td>
<td>27</td>
<td>77</td>
</tr>
<tr>
<td>Orang-utan (new)</td>
<td>248</td>
<td>63</td>
<td>25.4</td>
<td>26</td>
<td>76</td>
</tr>
<tr>
<td><strong>Total / Mean</strong></td>
<td><strong>3439</strong></td>
<td><strong>323</strong></td>
<td><strong>9.4</strong></td>
<td><strong>11</strong></td>
<td><strong>48</strong></td>
</tr>
</tbody>
</table>

Source: 3,439 tracking observations.
Table 7.2: Percentage of viewers who actually read signs and mean time of reading at Taronga Zoo.

<table>
<thead>
<tr>
<th>Exhibit</th>
<th>Number of Visitors</th>
<th>Visitors who Read</th>
<th>Attracting Power %</th>
<th>Mean Time (secs)</th>
<th>Holding Power %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elephant (old)</td>
<td>250</td>
<td>7</td>
<td>2.8</td>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td>Giraffe</td>
<td>589</td>
<td>23</td>
<td>3.9</td>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>Himalayan tahr</td>
<td>475</td>
<td>22</td>
<td>4.6</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>Seal</td>
<td>649</td>
<td>31</td>
<td>4.8</td>
<td>7</td>
<td>58</td>
</tr>
<tr>
<td>Chimpanzee</td>
<td>602</td>
<td>34</td>
<td>5.6</td>
<td>12</td>
<td>80</td>
</tr>
<tr>
<td>Meerkat</td>
<td>575</td>
<td>35</td>
<td>6.1</td>
<td>6</td>
<td>43</td>
</tr>
<tr>
<td>Gorilla</td>
<td>432</td>
<td>27</td>
<td>6.3</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Helmore aviary</td>
<td>501</td>
<td>35</td>
<td>7.0</td>
<td>8</td>
<td>32</td>
</tr>
<tr>
<td>Lion</td>
<td>835</td>
<td>72</td>
<td>8.6</td>
<td>17</td>
<td>33</td>
</tr>
<tr>
<td>Sun bear</td>
<td>617</td>
<td>60</td>
<td>9.7</td>
<td>10</td>
<td>38</td>
</tr>
<tr>
<td>Spider monkey</td>
<td>794</td>
<td>78</td>
<td>9.8</td>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>Kodiak bear</td>
<td>786</td>
<td>108</td>
<td>13.7</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>Koala</td>
<td>542</td>
<td>78</td>
<td>14.4</td>
<td>18</td>
<td>32</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7647</strong></td>
<td><strong>610</strong></td>
<td><strong>8.0</strong></td>
<td><strong>11</strong></td>
<td><strong>41</strong></td>
</tr>
</tbody>
</table>

Source: 7,647 tracking observations.

Table 7.3: Observed time for reading of signs in the zoos.

<table>
<thead>
<tr>
<th>Zoo</th>
<th>Number of Visitors</th>
<th>Number who Read</th>
<th>Attracting Power %</th>
<th>Mean Time (secs)</th>
<th>Holding Power %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adelaide</td>
<td>3439</td>
<td>323</td>
<td>9.4</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>Taronga</td>
<td>7647</td>
<td>610</td>
<td>8.0</td>
<td>11</td>
<td>41</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11086</strong></td>
<td><strong>933</strong></td>
<td><strong>8.4</strong></td>
<td><strong>11</strong></td>
<td><strong>44</strong></td>
</tr>
</tbody>
</table>

Source: 11,086 tracking observations.

At some exhibits, viewers either ignored or made little effort to read the signs. In Adelaide, these exhibits included the beaver (linked with the poor visibility of the animals), the otter (linked with movement and activity of the animals) and the Barbary sheep (linked with the age and appearance of the enclosure). At Taronga, small signage at the lion enclosure was positioned well above eye level and generally was not observed. Small signs at the gorilla enclosure were insufficient to cope with the large crowds which gathered to listen to the keeper talks at feeding time. The small identification sign at the meerkat enclosure was easily obscured when only a few people were present. The low figure for the attraction power of the signage at the spider monkey was linked with the age and appearance of the enclosure.
The signs which attracted most attention were those in colour and which were positioned at eye level. At Adelaide, higher attraction powers were recorded at the sun bear, meerkat and lion enclosures. At each of these enclosures, visitors perceived the exhibit as ‘natural’. The lion enclosure featured a series of smaller, colourful informative signs, some of which were interactive (Plate 7.6). Both the seal and hippopotamus signs provided detailed information. At Taronga, signs with a higher attracting power were those at the koala and Kodiak bear enclosures (Plate 7.7). Both these enclosures displayed information in a colourful and diagrammatic manner. As expected, labels at the koala, Tasmanian devil and platypus enclosures received considerable attention from international visitors.

A variety of competing aspects influenced visitors, some of which caused them not to read the signs. Some visitors professed an assumed knowledge of the animal, and more frequent visitors were perhaps well aware of the information provided. Small dimensions, poor positioning, and the possibility that a sign could be hidden when people stood in front of it, all had a negative influence on the attraction power of signage. Other factors included the length of text, the activity of the animals on display (which acted as a distraction), the presence of children (with their short attention span) and repeat visitation (where viewers indicated that they had read the information previously).

Overall, the mean holding power of the signs in both zoos was less than 50%, which indicated that less than 50% of the signage was read by viewers. It was apparent that animal activities such as vocalisation and play easily distracted viewer attention, contributing to the results for holding power being lowest at the flamingo exhibit in Adelaide and the gorilla exhibit at Taronga.
Plate 7.6: Sign at the lion enclosure in Adelaide, providing the opportunity of learning about the lion’s tongue through touch and feeling.

Plate 7.7: Informative signage at Taronga Zoo, providing diagrammatic information relating to the dietary habits of the Kodiak bears.
The majority of visitors who looked at the various exhibits did not read the signs. This section of research considered viewers in three groupings. Those who did not stop to read the label were recorded as a zero response and classed as ‘passers-by’. It is acknowledged that some of these ‘passers-by’ might actually have read some information ‘on the run’, although the amount of material absorbed would be minimal. Those who stopped at the labels for periods of one or two seconds were considered to ‘glance’ at the label, since they would have had sufficient time to read a limited amount of material only, possibly just the animal identification or heading. Visitors who stopped for periods of more than two seconds were classed as a ‘read’ response, since they had the opportunity to read at least one of the features indicated on the sign. Overall, the tracking results revealed that more than 90% of visitors to exhibits did not read the signs (Figure 7.1).

![Figure 7.1: Reading response of signs.](image)

Source: 11,042 tracking observations.
Reference: Appendix Table 7A.
It was apparent that few visitors (less than 10%) stopped to read the signs at the different exhibits, and that the majority of those who actually did stop read for short periods of time. The distribution of reading times of these visitors who stopped to read the signs at both zoos (Figure 7.2) indicated that 75% of ‘readers’ in Adelaide looked at the signs for less than 15 seconds, compared with 82% of ‘readers’ at Taronga.

Figure 7.2: Percentage distribution of reading times of visitors who stopped to read the signs at exhibits.

Source: 11,042 tracking observations.
Reference: Appendix Table 7B.
7.1.2 Perceived reading of signs

A much higher percentage of visitors indicated that they thought they read the signs. Responses to the visitor surveys indicated that 74% of visitors felt that they read signs for an average of 2.3 minutes (138 seconds) (Tables 7.4, 7.5). Observations showed this clearly was not the case (Figure 7.3). Although the survey question did not specify how many signs had been read, the results revealed that 19% of visitors did not read any signs at all throughout the day. Responses to the exhibit surveys showed that 41% of visitors initially indicated they had read the signs at the individual exhibits, but when asked some detail relating to the sign, nearly 75% of these respondents were unaware of the information provided, which confirmed the observed tracking figure that approximately 9% of visitors actually stopped and read signage. When asked their opinions, many visitors who indicated that they had read the signs were unaware of the actual position or size, suggesting that they had not in fact read nor seen them.

**Table 7.4: Perceived reading of signs by visitors in the zoos.**

**Number of visitors who responded that they read signs.**

<table>
<thead>
<tr>
<th></th>
<th>Adelaide</th>
<th></th>
<th>Taronga</th>
<th></th>
<th>Combined</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>Read</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>930</td>
<td>79</td>
<td>710</td>
<td>71</td>
<td>1640</td>
<td>75</td>
</tr>
<tr>
<td>No</td>
<td>245</td>
<td>21</td>
<td>290</td>
<td>29</td>
<td>535</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>1175</td>
<td></td>
<td>1000</td>
<td></td>
<td>2175</td>
<td></td>
</tr>
</tbody>
</table>

Source: Exit survey question 12, exhibit question 8.
Total 2,175 surveys
(Adelaide 1,175 – Taronga 1,000).

**Table 7.5: Perceived time for reading of signs by visitors in the zoos.**

**Time suggested by viewers for reading of signs.**

<table>
<thead>
<tr>
<th></th>
<th>Total Time</th>
<th>Number</th>
<th>Mean (mins)</th>
<th>Mean (secs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adelaide</td>
<td>1185.25</td>
<td>526</td>
<td>2.25</td>
<td>135</td>
</tr>
<tr>
<td>Taronga</td>
<td>978.9</td>
<td>386</td>
<td>2.54</td>
<td>152</td>
</tr>
<tr>
<td>Combined</td>
<td>2164.15</td>
<td>912</td>
<td>2.37</td>
<td>142</td>
</tr>
</tbody>
</table>

Source: Exhibit survey question 8.
Total 1,325 surveys
(Adelaide 725 – Taronga 600).
Considerably more people claimed to have read the signs than were actually observed by the tracking observations, which was consistent with a similar response reported by Serrell (1988). It was evident that several responses were inaccurate in their assessment of the amount of time spent reading the signs, particularly those responses which indicated a reading time greater than the total amount of time the respondent had spent viewing the entire exhibit. When asked, 78% of respondents at Adelaide indicated that they found the labels useful, and at Taronga the response was 70% (Table 7.6). Some of these respondents may have read the signs during previous visits and although they did not necessarily stop to read, they may have been aware of the information. These findings suggested that respondents were providing a response that they assumed was the ‘correct’ or ‘required’ answer and that they did not wish to give an impression that they had not read the label.

Figure 7.3: Perceived and observed times for reading of signs.

Source: 11,042 tracking observations; exhibit survey question 8.
Total 1,325 surveys (Adelaide 725 – Taronga 600).
Reference: Appendix Table 7C.
7.1.3 Perceived usefulness of signs

Responses to the visitor surveys indicated that 74% of visitors found the different signs as being useful (Table 7.6).

<table>
<thead>
<tr>
<th></th>
<th>Adelaide</th>
<th></th>
<th>Taronga</th>
<th></th>
<th>Combined</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>Useful</td>
<td>880</td>
<td>78</td>
<td>696</td>
<td>70</td>
<td>1576</td>
<td>74</td>
</tr>
<tr>
<td>Yes</td>
<td>245</td>
<td>22</td>
<td>304</td>
<td>30</td>
<td>549</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>1125</td>
<td></td>
<td>1000</td>
<td></td>
<td>2125</td>
<td></td>
</tr>
</tbody>
</table>

Source: Exit survey question 12, exhibit question 8.
Total 2,125 responses.
(Adelaide 1,125 – Taronga 1,000).

In their responses to the exhibit surveys, visitors indicated that they found the signs useful in that, as well as providing a more detailed description of the animal, they made available additional information, which was seen as being educational. In both zoos, informative signs placed near the exhibits were seen as being more useful than the descriptive signs at the exhibits. Visitors saw these signs (Plates 7.8 – 7.10) as being more educational, child-related and providing factual details of which the visitor had previously been unaware.

Plate 7.8: Informative sign at the sun bear enclosure at Adelaide Zoo. This sign was seen as being useful, in that it explained observable behaviours of the sun bear in manipulating enrichment devices.

They allowed me to answer the child’s questions (ASB38).
Plate 7.9: Informative sign near the penguin enclosure at Taronga Zoo. Visitors found this sign useful in that it drew attention to research being carried out by the zoo, as well as the presence of penguins in the nearby Sydney Harbour.

Plate 7.10: Informative sign at Taronga Zoo, explaining the concept of continental drift. The interactive nature of the sign permitted viewers to actually ‘move’ continents on the globe and gain an appreciation of the hypothesis of continental drift.
7.1.4 Satisfaction with signs

Although the majority of visitors did not read the signs at the different exhibits, they considered that the signs were of high standard. Survey responses showed that 23.6% of visitors considered that the signs were excellent and 67% better than satisfactory (Figure 7.4). The responses in both zoos were similar, and only 9% regarded the labels as less than satisfactory.

![Figure 7.4: Satisfaction rating: Enclosure signs.](image)

**Figure 7.4: Satisfaction rating: Enclosure signs.**

*I Poor : 5 Excellent*

Source: Exit survey question 16.

Total 850 surveys (Adelaide 450 – Taronga 400)

Reference: Appendix Table 7D.
### 7.1.5 Suggested improvements to signs

A number of suggestions and improvements to the signage were proposed by respondents. These ideas were tabulated and are depicted graphically in Figure 7.5 (Appendix Table 7E).

![Figure 7.5: Suggested improvements to signs by visitors.](image)

Some improvements suggested by visitors in their survey responses included:

- Provide more signs at exhibits (gorilla, meerkat at Taronga)
- Position at or near eye level
- Develop voice-activated signs for sight-impaired visitors
- Make the signs more child-friendly
- Provide smaller and more colourful versions for children
- Include personal data regarding animal (e.g. name, diet, age, weight)
- Give name and age of individual animals (where appropriate)
- Display signs throughout the zoo to show possible directional routes (include map reference)
Directional maps within the zoo were commented upon favourably at Adelaide, but unfavourably at Taronga. This was attributed to the fact that during the first half of the research period, some directional maps at Taronga were upside down, which caused considerable confusion, particularly for visitors who were unaware of the actual layout of the zoo. However, even after this was corrected, responses showed that visitors continued to express concern as they found the directional maps difficult to comprehend.

Comments which reflected personal opinions of visitors included:

Adelaide

Don’t change the labels, because if you put too much on them, then no one can be bothered reading them (A222).

Adelaide zoo does a great job providing information about exhibits, particularly the endangered status (A227).

We would like more information about particular animals – the children think of them as close friends (Member) (A254).

Taronga

It depends on whether people would read them (T301).

We found the map was hopeless (T171).

The maps were stupid, we kept going to the wrong places (T91).

Just as children had a marked influence upon the viewing behaviour of adult visitors at exhibits, they also influenced the reading behaviour of adults. The majority (91%) of comments made relating to signage included reasons relating to children. Many responses used the presence of children as a justification or a pretext for not reading the signs. Comments such as the following were common:

I did not read the signs as my child was impatient (A46).

With little children you don’t have time to read the signs (A145).

We didn’t read the signs, the children wanted to move on (TSB22).

The grandchild was impatient and wanted to move on so we didn’t read the labels (T259).

They helped educate the children (TKB29).
7.1.6 New signage

Most exhibits at Adelaide carried signage which was positioned near the front of the enclosures. These identifying and descriptive signs mostly featured black halftone captions and text over a one-colour halftone brush metal surface. The graphic representation of the animal gave the impression of a drawing rather than a photograph (Plate 7.4). With the opening of the new South East Asian Rainforest exhibit, Adelaide Zoo developed a new form of exhibit signage (Plate 7.11). This new signage was larger, basically rectangular in shape and was capped with a free form, which traced the outline of the animal. These new more colourful montages featured a prominent digital image of the particular animal which conveyed information to the reader and listed animal’s the natural habits and habitat under a series of colour icons. Positioned at visitor eye level, the new labels were clearly visible to all (Plate 7.12).

Plate 7.11: New signage at the South East Asian Rainforest enclosure at Adelaide.

Sumatran Tiger Sign

Siamang Sign

Plate 7.11: New signage at the South East Asian Rainforest enclosure at Adelaide.
Plate 7.12: The new sign at the tiger enclosure at Adelaide Zoo, positioned near eye level.

Tracking results obtained at the new exhibits were compared with those obtained at older enclosures a year earlier (Table 7.7).

Table 7.7: Attracting power (A.P.) and holding power (H.P.) of signs at old and new enclosures at Adelaide Zoo.

<table>
<thead>
<tr>
<th>Exhibit</th>
<th>Old Enclosure</th>
<th>New Enclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A.P.</td>
<td>H.P.</td>
</tr>
<tr>
<td>Orang-utan</td>
<td>5</td>
<td>44</td>
</tr>
<tr>
<td>Tiger</td>
<td>3</td>
<td>43</td>
</tr>
</tbody>
</table>

Source: 884 Tracking observations.

At both enclosures, the attracting and holding power of the new style graphics increased markedly. The attracting power of the new labels results in six times the number of viewing groups actually stopping to read the information. Since greater amounts of information were provided on the new signage, the substantial increase in holding power indicated the potential for an enhanced learning experience. Survey responses provided an indication of visitor appreciation of the new graphics. When requested to indicate the usefulness of the new signage, 92% of the visitors who had read the graphics commented positively, a figure substantially greater than the 62% who had made positive comments at the older signage.
When Meredith Bashaw and Terry Maple (2001) examined the use of new signage at the tiger enclosure in Zoo Atlanta, they found that few visitors read the new signs. Similarly, Joanne Louch et al. (1999) found that new signage in Jersey Zoo was not as effective as older signage in attracting visitor attention. The new signage at Adelaide contained more information, which consequently took longer to read. The visual appeal of these new signs attracted attention and encouraged viewers to read more, which increased the holding power. This suggested that the length of the text was not necessarily a key determining factor in the reading of various signs.

At Taronga, as part of the overall development within the zoo, new signage was developed for certain exhibits. A new sign at the snow leopard enclosure gave the names of the animals, the date of birth of the young kittens, and displayed a photograph, so that visitors could easily identify the animals on display (Plate 7.13). This new label was positioned approximately three metres above the ground, and as it was attached to part of the roofing structure was well above eye level (Plate 7.14). Tracking results at the snow leopard exhibit indicated that the new sign received little attention from visitors. The low figure for attracting power (3%) was attributed to the poor positioning of the new sign, as it was apparent that many visitors were completely unaware of it. One young mother commented that the only reason she had noticed the sign was that while she was kneeling, attending to her two-year-old in a pram, she chanced to look directly above her head and saw the sign by accident. It was interesting to note that when visitors actually did see this new sign, they tended to read it in its entirety.

Table 7.8: Attracting power (A.P.) and holding power (H.P.) of signs at snow leopard enclosure at Taronga Zoo.

<table>
<thead>
<tr>
<th></th>
<th>A.P.</th>
<th>H.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow leopard (old)</td>
<td>6</td>
<td>48</td>
</tr>
<tr>
<td>Snow leopard (new)</td>
<td>3</td>
<td>95</td>
</tr>
</tbody>
</table>

Source: 942 Tracking observations.
Plate 7.13: Informative sign at snow leopard enclosure at Taronga.

Plate 7.14: Viewers at the snow leopard enclosure. The identification sign is positioned in the roof structure, well above general eye level.
Book Graphics

At the chimpanzee enclosure at Taronga, a book style graphic was employed to assist
visitors interpret different chimpanzee behaviours (Plate 7.15). The pictures and captions were
not the scientific drawings that could be seen in standard text books, but featured amusing
diagrams designed to capture the imagination by humorous means. The large laminated pages
of the book were linked with large rings and mounted on a lectern. Using the same tracking
methods which had been employed throughout this research, viewers were observed at this
enclosure to determine if the different style of graphics influenced the overall patterns
observed with reading signs in the zoo. In total, the reactions of 2442 visitors were observed,
comprising 1745 adults and 697 children in 949 group categories (Table 7.9). It was found
that 87% of viewers passed by the books, 2% glanced at them, and 11% stopped to look at
them, findings that were not significantly different from the reading patterns observed with
the signs at other enclosures throughout the zoo. When groups did stop to look at the books
(Plate 7.16) they stayed for longer periods of time, which was reflected in the higher result
obtained for the holding power. The mean time spent looking at the books was 38 seconds,
which was considerably longer than the mean of 11 seconds for reading signs. When visitors
stopped to read the books, it was observed that 37% looked at all the pages and that a
significant proportion used the diagrams to interpret an observed behaviour. It was also
apparent that the graphics were responsible for a number of conversations, with a maximum
reading and interpreting time being 164 seconds.

Plate 7.15: Chimpanzee book graphics.
Table 7.9: Reading behaviour of visitors.
Graphic books at chimpanzee enclosure at Taronga Zoo.

<table>
<thead>
<tr>
<th>Viewers</th>
<th>Read Books</th>
<th>Glance at Books</th>
<th>Mean Time</th>
<th>A.P.</th>
<th>H.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Number</td>
<td>%</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>949</td>
<td>100</td>
<td>10.5</td>
<td>38</td>
<td>2.4</td>
<td></td>
</tr>
</tbody>
</table>

Time in seconds.
Source: 949 tracking observations.

Plate 7.16: School students looking at the graphic books near the chimpanzee enclosure.

The books were well done, they allowed easy explanation for young children (TC13).
The use of signage throughout the zoos represented an effective method to increase awareness and develop visitors’ understanding of animals. The new style of signage used in Adelaide clearly demonstrated that the attracting power of signs was increased through the use of larger signs which featured colour and photographic material, results which suggest that these new graphics greatly enhanced the potential for the education of visitors. Signs are a valuable resource in the zoo, particularly since they represent one of the opportunities to educate visitors, not only about the specific animals on display, but also in detailing research being carried out by the zoo or conservational issues surrounding the animal’s existence in the wild. Towards the end of this research, a number of new informative signs were developed in both zoos (Plates 7.17 – 7.19). Rather than providing simple descriptive material, these signs provided a potential for education. This research did not explore specific information as to what visitors actually read; nor what they looked at, such as text or pictures – that remains a matter for future study. However, it became apparent that the visitor’s experience is not simply a result of what the exhibit offers, but rather to what the visitor chooses to pay close attention. To hold attention, it must first be attracted in some way. The new style of graphics attracted more attention, and consequently the potential for learning in the zoo was enhanced. best summarised in the words of Mihaly Csikszentmihalyi (1995:62) ‘Attention is a scarce resource – perhaps the most precious resource there is’.

Plate 7.17: New signage in the Wild Asia aviary at Taronga, depicting an Asian legend.
Plate 7.18: New informative sign near the mandrill enclosure at Adelaide.

Plate 7.19: Informative new signage at Taronga (Wild Asia)
7.2 Enrichment

The concept of enrichment use in zoos derived from psychologists studying methods of ameliorating developmental problems brought about as a result of experimentally induced problems (Chamove & Anderson, 1989). Over the last thirty years, public awareness of how animals behave in the wild has increased pressure on zoos to improve the welfare of their animals. This they have attempted to achieve through the use of enrichments (Young, 1998:17). The range of enrichments used has been diverse, and has varied greatly with different animals at different exhibits. They have included such items as treat logs for sun bears, ice blocks for otters (Plate 7.20), hanging flower delicacies for gorillas and balls for lions. Earlier research at Taronga (Frede, 2003) showed that once an animal was observed manipulating different enrichment items, visitors became intrigued by the different behavioural patterns and viewed for longer periods of time. This increase in viewing time could have been the result of a number of factors, such as an improvement in the variety of behaviours, a decrease in what was regarded as unpleasant behaviour (such as coprophagy), an interest in something that was different, or it may simply have been the result of seeing active animals in aesthetically pleasing surroundings.

Plate 7.20: Otters eating their ‘fishicle’ ice block enrichment at Adelaide Zoo.
Although considerable work has been carried out in recent years and much has been accomplished regarding enrichment (Partridge, 1992), difficulties have been experienced in continually developing new ideas which challenge the animals. Sun bears, for example, are ingenious in finding their food and so represent a constant challenge for keepers to widen their thinking and develop new ideas in relation to supplying their dietary requirements. Graham Law and Andrew Kitchener (2002) developed an artificial fruit tree which would stimulate the natural ‘tree-shaking’ behaviour of bears. Labelled a ‘wobble tree’, the name indicates how the device behaves when pushed around by a foraging bear. One of these has been replicated in Adelaide (Plate 7.21). Designed to stimulate tree shaking behaviours in captive bears so that they could acquire food, the wobble tree also attracted considerable visitor attention whenever it was used by the sun bears.

Plate 7.21: Wobble tree in the sun bear enclosure at Adelaide Zoo.
The use of enrichments is a relatively new idea in zoos, having been developed over the last two decades only. The historical review in Chapter 2 revealed that although considerable research has been devoted to developing a wide range of enrichments for animals, little research has been carried out into visitors’ perceptions of enrichment, certainly none in Australia. This present research evaluated the degree to which zoo visitors were aware of and recognised the value of various enrichment items. This was achieved by investigating visitors’ perceptions of enrichment strategies and assessing the visitors’ thoughts relating to the use of such items.

In recent years enrichment has played an important part in the management of animals kept in captivity in zoos. Markowitz (1997) pointed out that the role of zoos was not just to conserve animals, but also to conserve the range of behaviours of these animals. In this regard, a number of forms of enrichment been shown to be beneficial for the animals (Young, 2003), particularly those associated with the hunting behaviour of carnivores. Apart from being advantageous for the welfare of animals by encouraging natural behaviours (e.g. Markowitz et al., 1995; Williams et al., 1996), the use of enrichments has led to visitors seeing more of the behaviours and abilities of the animals on display (Plate 7.22). This has reinforced the premise that the use of enrichment devices in the zoo has the potential to contribute to the education of zoo visitors.

Plate 7.22: Lioness playing with an enrichment device at Taronga.
7.2.1 Visitor perception of enrichment

The aims of using enrichments for zoo animals encompass not only improvements to animal welfare but also the promotion of natural behaviours. Because of this diversity, the use of enrichment has taken many different forms, with the result that a number of different approaches towards the use of enrichment have developed in zoos. Although considerable research has been carried out to study the influence of enrichments with different animals, little consideration has been devoted to the education of the zoo visitors. At Adelaide, the ‘Two Hippo’ enrichment tour, developed to explain the basic ideas of enrichment use, actively involved visitors in the overall programme. Although a wider range of enrichment items was used in the different enclosures at Taronga, visitor participation has not been encouraged.

This research considered the degree to which various enrichment items were noticed by visitors and whether the purpose and importance of these items in the different enclosures was understood. An attempt was made to determine whether visitors considered enrichments to be natural and whether they perceived the use of enrichments to be conducive to a better understanding of an animal. To determine their perception of the different items supplied for the well-being of the animal, visitors were asked to indicate their level of agreement with a series of statements. The level at which visitors agreed or disagreed with these statements is summarised in Table 7.10.

The results indicated that visitors strongly agreed that animal enclosures in the zoo should look as natural as possible and that the animals in the zoo should be provided with items to stimulate their minds and keep them fit and active. The majority of visitors indicated a desire to see this type of activity and less than 10% of respondents strongly agreed that enrichment usage should be in the animal’s den, out of sight of viewers. Only 18% maintained that any devices used should only be natural items found in the wild.

Visitors considered that it was important to encourage animal activity and that enrichment items should be made use of to improve the animal’s environment. Opinion was divided as to whether the devices should be natural or artificial. Studies have shown that the more ‘real’ an exhibit was perceived to be, the more positive were the attitudes of visitors towards it (Bitgood & Patterson, 1987). This research confirmed that visitors agreed with the
principle of enrichment usage, although as will be shown, they were not always aware of, nor did they fully understand enrichment usage.

Table 7.10: Visitor perceptions of enrichment.

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>Strongly Disagree</th>
<th>Mildly Disagree</th>
<th>Neutral</th>
<th>Mildly Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is important for captive animals in a zoo to live in the same sort of way as they would in the wild.</td>
<td>0.7</td>
<td>0.6</td>
<td>3.8</td>
<td>16.5</td>
<td>78.4</td>
</tr>
<tr>
<td>It is important to encourage captive zoo animals to move around and explore their enclosures.</td>
<td>0.6</td>
<td>0.5</td>
<td>3.1</td>
<td>15.6</td>
<td>80.2</td>
</tr>
<tr>
<td>Animal enclosures in the zoo should look as natural as possible.</td>
<td>0.5</td>
<td>0.5</td>
<td>2.5</td>
<td>14.1</td>
<td>82.4</td>
</tr>
<tr>
<td>Any enrichment items provided for animals in the zoo should best be kept in the animals den, out of sight from viewers.</td>
<td>35.4</td>
<td>20.1</td>
<td>26.4</td>
<td>8.6</td>
<td>9.5</td>
</tr>
<tr>
<td>Captive animals in a zoo should be provided with items to stimulate their minds and keep them fit and active.</td>
<td>0.9</td>
<td>0.5</td>
<td>2.6</td>
<td>12.9</td>
<td>83.1</td>
</tr>
<tr>
<td>Any devices in exhibits should only be natural items found in the wild, not artificial or man-made.</td>
<td>15.8</td>
<td>22.1</td>
<td>33.2</td>
<td>11.3</td>
<td>17.6</td>
</tr>
</tbody>
</table>

Results expressed as a percentage.

Source: Exhibit survey question 11.
Total 1,325 surveys (Adelaide 725 – Taronga 600)

More than 90% of viewers agreed that animals in captivity should be provided with enrichment items to keep them occupied. Visitors considered that the main purpose of these items was to encourage some form of activity. This represented a paradox, in that visitors accepted the need for enrichment items and realised their importance, but did not recognise their usage (Section 7.2.2). As visitors observed animals manipulating enrichments, they became more aware of the different devices in use and consequently received their own enrichment as they watched the different behaviours of the animals (Plate 7.23). It was difficult to determine the exact manner in which visitor learning, if any, took place. It was impossible for keepers to be on duty to give talks to the public for all viewing hours throughout the day, and trained educationalists who could provide accurate information were scarce. These facts, combined with the reality that labels at exhibits were not effectively utilised, limited the success of learning and understanding in the zoo.
Plate 7.23: Beaver manipulating enrichment material at Adelaide.

We come to the zoo quite often, and we have never seen the beaver play like this before, we learnt so much (AB15).

Murray (1998) carried out similar research when she surveyed the priorities given to visitor perception by zoo administrators at different Australian zoos. Her respondents (zoo administrators) considered that enrichment objects were best utilised off-exhibit, out of sight of the viewers. The differences in findings between this research and that of Murray suggest that zoo administrators may not fully understand and appreciate visitor perceptions. Eventually, therefore, zoo administrators may need to be educated as to the impact of enrichments upon visitors. It became apparent that the increasing use of enrichments for animals in zoos should be accompanied by an increase in providing knowledge and understanding related to enrichment usage, for those who visit the zoo. What zookeepers consider as being good for a particular animal may not necessarily be obvious, or understood by members of the viewing public. It became clear that together with the development of enrichment programmes in the zoo there should be an associated provision for the education of visitors, an idea which has already been proposed by Jim Cronin et al. (1998: 231).
7.2.2 Awareness of enrichment

Although visitors acknowledged the need for enrichment items with captive animals in the zoo, 52% of visitors indicated that they had not noticed the various enrichment items and only 35% of visitors interpreted their use correctly (Figure 7.6).

![Figure 7.6: Awareness of enrichment items.](Image)

Source: Survey exhibit question 7, exit question 11.
Total 2,175 surveys (Adelaide 1,175 – Taronga 1,000)
Reference: Appendix Table 7F.

Responses to the exit surveys indicated that 67% of visitors saw at least one of the different items that were used to encourage animal activity in the different enclosures. However, when asked to specifically identify these items, most visitors incorrectly indicated features such as shade, shelter, perches or rocks; items, which in general, are considered basic essential requirements for an enclosure and are not regarded as enrichment objects. Slightly more than 10% of visitors were aware of the reasons for the presence of PVC tubes, balls and coconuts in exhibits housing animals like the lions and the sun bears (Plate 7.24). At times the public misinterpreted the use of enrichments and simply regarded the various devices as unnatural ‘junk’, subsequently assuming that if the animal actually played with the item it was an abnormal behaviour.
Look, some child has thrown that in there

Look’s like the workmen left some of their things behind

What are they?

Plate 7.24: Various enrichment items:- a soft toy, a tube stuffed with peanuts and currents, and pine cones stuffed with food rewards.
7.2.3 Appreciation of enrichment

It was evident that the level of visitor satisfaction regarding enrichment items was different in the two zoos, with 13% of visitors at Adelaide being less than satisfied compared with 7% of visitors at Taronga (Figure 7.7). Even though visible enrichments were not used in as many enclosures at Adelaide as at Taronga, the lower level of satisfaction was attributed mainly to the lack of observation, or to incorrect interpretations. This represented a wasted opportunity for the zoo to provide information which could help improve the level of viewers’ understanding.

![Figure 7.7: Satisfaction rating: Enrichment items.](image)

**Figure 7.7: Satisfaction rating: Enrichment items.**

(1 Poor, 5 Excellent)

Source: Exit survey question 16G.
Total 2,175 surveys (Adelaide 1,175 – Taronga 1,000)
Reference: Appendix Table 7G.

Survey results showed that visitors cited a variety of reasons for using enrichment items within the zoo (Table 7.11). Although most visitors (54%) related the use of enrichment items to the animals, a high proportion did not consider them as being beneficial to the animals, with 21% regarding them as being for the benefit of viewers and 18% relating them to the enclosure.


Table 7.11: Viewer perceptions of reasons for enrichment usage.

<table>
<thead>
<tr>
<th>REASONS</th>
<th>ADELAIDE</th>
<th>TARONGA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Total</td>
<td>% Total</td>
</tr>
<tr>
<td><strong>Animal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Movement and activity of animal</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Fun and enjoyment of animal</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Relieve animal boredom</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Safety and care of animal</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Animal welfare</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Provide food for animal</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Stimulate the animal</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>57</td>
</tr>
<tr>
<td><strong>Viewer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>People enjoyment, entertainment</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Viewer benefit</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Create interest for visitors</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Safety of people</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Education of viewer</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve enclosure</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Substitute for nature</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Aesthetics</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevent animal escape</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>‘No idea’</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Results stated as a percentage of total responses provided.

Source: Exit survey question 11, exhibit survey question 7.

It became apparent that a number of misconceptions existed in the visitors’ minds as to the use of enrichment items. This was most noticeable at the chimpanzee enclosure, where the animals manufactured and used natural ‘tools’ in an effort to extract food rewards from their ‘termite mounds’ (Gilloux et al., 1992). Unfortunately, there was little detailed explanation of this particular use of tool-making available for the viewing public. Reference was made to this unusual activity in the chimpanzee book graphics, although, as was shown earlier, these books were read by only 10% of viewers.

Examples of some of the misconceptions are listed below. These responses reflect the ways in which visitors interpreted various enrichment items and their perceived reason for their use. With some comments, the specific animal or exhibit is indicated in parentheses.
**Adelaide**

Enclosure fences restrain both animals and visitors (A215).

Stakes (in hippopotamus enclosure) protect viewers from wild animals (AH38).

Space (in the lion enclosure) provides better viewing (AL15).

The grassed area (for pelicans) is good for photography (A385).

Electric fences protect the viewers from the animals (A164).

Wire (at the tiger enclosure) for protection of viewers (ATo12).

Wire over the top of the enclosure stops the animal (orang-utan) throwing things at visitors (AOOr24).

Sign (at wombat) warning visitors that they bite (AW23).

Double doors (on aviary) stop the birds escaping (AW7).

Water (at otter) is for swimming (AO1).

Water (in seal) enclosure allows the animal to move about (A4).

Heat lamps keep the animal in a place where it can be seen, for visitor entertainment (AM40).

**Taronga**

Net in the tree (chimpanzee) replicates foliage, which would not allow people a clear view (TC38).

Play equipment (in the gorilla den) is to entertain people (TG24).

The can on string is for spectator amusement (TEo8).

The posts around the tree (in the old elephant enclosure) protect the tree from the animal (TEo13).

Lichen on the rock, to add to the animal’s (Kodiak bear) diet (TKB18).

Food placed in containers, to stop people feeding them (giraffes) (TG3).

Perch (in the aviary) for better viewing (TH33).

The ‘no feeding’ signs, so the kids don’t get hurt (T235).

The glass barrier (at the tiger enclosure) protects people (TT11).

The electric fence, but I have no idea why (T369).

Enrichments ensure that the animals appear in a natural habitat, for visitor benefit (TSB34).

They (the lions) have platforms, to make viewing easier (TL7).
Comments such as those above reflected the way in which the majority of zoo visitors expected that the animals they were viewing to be active and entertaining. By providing animals with enrichments, not only can the public be entertained, there is the distinct possibility that viewers might also develop a better understanding of the function of enrichments and so improve their level of education regarding the animals they observed. Markham (1990) indicated that the primary purpose of modern zoological gardens was to educate the public about the animals on display and to encourage the conservation of their natural habitat. A considerable potential exists in both zoos to explain such activities and develop a better understanding of the animal on display. The ‘Two Hippo’ tour at Adelaide provided the opportunity for visitors to observe the preparation of different enrichment items and participate in their distribution. Survey responses indicated that visitors who undertook this new tour developed an improved knowledge and a better understanding of the concept of using enrichment devices in the zoo.

At Taronga, labels at the clouded leopard and seal enclosures made specific reference to the use of enrichments, but survey responses reflected that these had not been read. The sack hanging in the clouded leopard’s enclosure, which was clearly visible and obvious, was neither appreciated nor understood by more than 90% of viewers. Although survey responses indicated that 42% of visitors signified that they had read the signs, this evidently was not the case. Tracking observations confirmed that less than 9% of viewers actually read the labels at the enclosure. Similar figures were obtained at the seal enclosure, where 45% of survey respondents indicated that they read the signs but less than 10% understood the reason for empty crates floating in the seal pool. Since in general these labels were not read, it would appear that the potential for improving and understanding knowledge regarding enrichment use was not fully developed. One possibility is that at Taronga a keeper or other knowledgeable person be made available to explain the purposes of enrichment usage carefully.

One of the best examples of the way enrichment use attracted visitor attention was observed at the sun bear enclosure at Taronga. It was common for both bears to be seen playing with enrichments and actively manipulating any items supplied. The manner in which they manipulated coconuts always attracted attention, particularly when the female sun bear methodically attacked the coconut with her strong claws in an effort to extract the milk from the inside (Plate 7:25). A wide range of behavioural patterns were demonstrated whilst the sun bears balanced in trees or actively demolished woodpiles in their efforts to find a few pieces
of hidden food rewards. Enrichment activity at sun bears increased the holding power of the exhibit by more than 12 times that noted when the animals were inactive or sleeping (Table 7.12). Not only did viewers seem to grasp the concept of enrichment readily at this exhibit, they were also fascinated by the manner in which the bears reacted to their various enrichments. Visitors were even more impressed when they learned of the changes that had taken place in both animals’ behaviour since the time of their arrival at the zoo after being rescued from the restaurant trade in Cambodia.

Plate 7.25: Victoria, a sun bear at Taronga, obtaining milk from her coconut. In her unique style, while holding the coconut in her hind limbs she extracts the eye of the coconut, before rolling onto her back and pouring the milk into her mouth.

Whenever the sun bears were clearly visible as they manipulated their enrichments, their activity not only attracted the attention of visitors for longer periods of time but also influenced visitors’ perceptions as they attempted to determine the purpose of the enrichment. Survey responses indicated that visitors perceived the quality of life of the animals to be improved through the use of the different enrichment items, something which pleased and delighted the viewers.
Table 7.12: Mean viewing times at sun bear exhibit at Taronga Zoo.

<table>
<thead>
<tr>
<th>Animal Activity</th>
<th>Viewing Time (Sun Bear)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out of sight</td>
<td>20</td>
</tr>
<tr>
<td>Sleeping</td>
<td>27</td>
</tr>
<tr>
<td>Alert, inactive</td>
<td>29</td>
</tr>
<tr>
<td>Pacing</td>
<td>48</td>
</tr>
<tr>
<td>Movement</td>
<td>55</td>
</tr>
<tr>
<td>Interact, play</td>
<td>57</td>
</tr>
<tr>
<td>Feeding</td>
<td>84</td>
</tr>
<tr>
<td>Enrichment use</td>
<td>297</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td><strong>70</strong></td>
</tr>
</tbody>
</table>

Given that one purpose of zoos is education, an important aim of enrichment should be that it is conducive to the enlightenment of visitors, by means of exhibits that are enriched and are in consequence more informative and interesting (Kreger et al., 1998). Shepherdson (1998) pointed out that one role of enrichment is to ensure that zoo exhibits are naturalistic for both the inhabitants and the viewer. Since some artificial devices in many modern exhibits could be misunderstood and considered by viewers as aesthetically unacceptable (Kreger et al., 1993), there is a practical educational reason for adhering to the aesthetic value of an exhibit. One anticipated problem with enrichment usage is that the visitors’ conceptions of ‘naturalistic’ may not necessarily reflect the animals’ experience.

As zoos worldwide have integrated enrichment programmes into their daily activities and management routines, it has become apparent that the large majority of the visiting public have been oblivious to the presence of enrichment items in enclosures, remaining unaware of these programmes. From visitor comments it was also apparent that the reasons for enrichment usage were often misinterpreted. There was a perception from some visitors that the use of enrichments affected the cleanliness of the enclosure. Visitors often assumed that the enclosure had not been cleaned properly; that some items had been left accidentally by keepers or that possibly something had been thrown into the enclosure deliberately. Visitors’ comments include:-

*Uneaten fruit attracted rats in sun bear enclosure* (A256).
*There was torn up paper in orang-utan cage* (A395).
*There were banana peels left lying in the sun bear enclosure* (T224).
*A milk crate was left floating in the seal pool* (T369).
Visitors did not always easily understand that there may have been sound reasons for artificial objects such as milk crates and torn newspapers being left in the enclosure. Nor did they appreciate that a pile of elephant dung left in the lion enclosure may have been deliberately left in an attempt to provide a natural form of sensory enrichment for the animals. Visitors to zoos often mistakenly believe that the welfare of an animal directly relates to the amount of space with which it is provided in the enclosure. However, it has been widely reported that improvements in quality of care, rather than quantity of space, result in the greatest improvements in welfare (Chamove, 1989; Hughes et al., 1989; Line, 1987). Consequently the welfare of animals is best served not necessarily by increasing the size of the enclosure but by enriching the space available. Accordingly, the aims of enrichment for zoo animals are not only to improve welfare, but to promote, as much as possible, natural behaviours (Plates 7.26 – 7.28).

Plate 7.26: The pride of lions attacking their Sampson enrichment device during an experimental session at Taronga Zoo in 2001. The use of the ball, attached to an elasticised rope and containing meat rewards, encouraged behaviours, similar to those a pride would normally show in achieving their meal in the wild.
Plate 7.27: A leopard seal at Taronga, circling an ice block ‘fishicle’ enrichment, prior to attacking the block to remove the frozen fish reward.

Plate 7.28: Sun bears are ingenious at finding food rewards. Here, a sun bear is methodically rotating a tube containing peanuts and small pieces of fruit. The use of such items has helped overcome stereotypic behavioural problems developed during their captivity in the Cambodian restaurant trade.
7.3 Feeding of live prey to zoo animals

Captive animals were always more active and showed more interest in their surroundings during feeding sessions. This type of behaviour was observed even with slow moving animals, such as koalas and orang-utans. In Chapter 5, it was shown that the holding power of different exhibits increased markedly when the animals were active or were engaged in foraging their food. Like most zoos, Adelaide and Taronga advertised the main feeding times and encouraged visitors to view these sessions. It became apparent that these public feeding sessions were an efficient and cost-effective method of engaging visitors and, as was observed with the penguin feeding in Adelaide, which provided a potential for education when accompanied by keeper talks.

In terms of the welfare of captive animals, a major predicament confronting zoo keepers has been the challenge of feeding carnivorous animals. In the wild, carnivores such as lions, tigers and leopards, which naturally stalk and hunt their prey, are highly motivated to hunt for their food (Leyhausen, 1979), but in captivity they are unable to do so. Researchers like Markowitz (1982) and Hughes and Duncan (1988) have linked this lack of predatory hunting with abnormal behavioural patterns observed in captive carnivores. The idea of feeding carnivores live prey has been suggested as a possible method of providing an illustration of predatory behaviour. This approach has been investigated by researchers such as Hammond (1998) and Raymond Ings et al. (1997). In general, zoo administrators have not adopted the idea, dismissing it as impractical for veterinary, ethical or public relations reasons (Bradshaw et al., 2001). Ings and colleagues reported on the findings of a survey they conducted at Edinburgh Zoo in 1997 when they assessed the different attitudes of the public to the feeding of live prey to zoo animals. From their findings, they concluded that it was possible that visitors were more likely to accept the idea of feeding live prey than had been assumed by zoo authorities. Further, they cautioned that because of cultural differences in attitudes towards animals and the sensitivity of people in the United Kingdom to animal welfare issues, their data should not be generalised for other countries. On a smaller scale, Nelson carried out similar research when she surveyed 50 respondents at the privately owned National Zoo and Aquarium in Canberra (Nelson, 2003).

In this research, the thoughts of visitors about the (hypothetical) feeding of live prey to captive carnivores were examined, as outlined in Chapter 3. The data required for the
statistical analysis was obtained directly from the survey responses, and the large sample ensured that any bias was minimised. This research sought to expand on that of both Ings and Nelson. As well as being illegal, the practice of feeding live prey to carnivores in Australian zoo animals has been considered by zoo management as being unacceptable, particularly as it has raised serious ethical problems. There have been a few exceptions, such as the feeding of meal worms and small insects to some birds and other carnivorous animals, but in general the practice has not been followed. The method of providing a whole carcass has been shown to improve the health and well-being of animals as well as developing natural hunting behaviours (Bond & Lindburg, 1990). However, it has not always brought out the full range of searching and feeding behaviours described by Donald Lindburg (1988), since much abnormal behaviour has been observed in some carcass-fed carnivores. Synder (1977) also noted that the placing of disorientated prey in normal enclosures only resulted in a quick kill and did not assist in overcoming various behavioural problems.

A reduction in the percentage of respondents agreeing with feeding live prey to animals occurred with the increasing complexity (insect to rabbit) of the animal being used as prey (Figure 7.8). Nearly all (99%) visitors surveyed agreed with the feeding of live insects to lizards both on and off exhibit, with 10% objecting if this method was carried out in full view of the public. In fact, this type of feeding already occurred, with mealworms commonly being used to feed birds and other animals such as the platypus. More than half of the respondents (55%) disagreed with the use of feeding live rabbits to lions and tigers, with only 16% of visitors being in agreement with this practice taking place in full public view. A majority of respondents (88%) agreed with the use of a carcass for animals such as lions and tigers, although several comments suggested that the carcass should not be recognisable. During normal feeding sessions in Adelaide, generally the various pieces of food supplied to the lions and tigers were unrecognisable, so that viewers regarded this food simply as ‘meat’, rather than as having originated from a specific animal.
Figure 7.8: Feeding of live prey to captive carnivores: Overall level of agreement.

Source: 504 surveys.
Reference: Table 7H.
Figure 7.9 shows the difference in attitude between male and female visitors to the zoo. Although female visitors objected more to the feeding of live prey than did male visitors, this difference in attitude was not as marked as the results described in the study carried out in Edinburgh by Ings et al. (1997). Many comments from females reflected a concern about animal welfare (particularly that of the prey), but the majority of comments referred more to a concern that the viewing of such feeding would be too upsetting, particularly for any young children present. Previous studies of the attitudes of visitors towards animal welfare also indicated that females expressed greater concern than males (Kidd & Kidd, 1989).

Figure 7.9: Feeding of live prey to captive carnivores: Level of agreement by gender.

Source: 504 surveys.
Reference: Appendix Table 7I.
Reade and Waran (1996a) found that older people were less concerned than young people with the feeding of live prey. The present research indicated that both older people (60 years and over) and younger people (under the age of 20 years) showed more disagreement with the feeding of live prey than other adults, particularly those in the 20-39 age group (Figure 7.10). As previously indicated, surveys were not distributed to school children, so that the response group of ‘under 20’ was represented by only a small group of older teenagers.

Figure 7.10: Feeding of live prey to captive carnivores: Level of agreement by age group.

Source: 504 surveys.

Reference: Appendix Table 7J.
Little variation was observed between the responses of pet owners and non-pet owners (Figure 7.11). Previous studies of the attitudes of visitors towards animal welfare indicated that pet owners showed a greater concern than non-pet owners (Paul & Serpell, 1993). In the present study the majority of the pet owners surveyed mainly kept dogs and cats, which at meat (in many cases references were made to cats, which had at some stage been observed to catch birds or small mammals). It was apparent that personal emotions strongly influenced viewer attitudes, as it was noticeable that of those who indicated that they owned a rabbit as a pet, all opposed the use of rabbits as live prey. In a similar manner, all bird owners objected to the possibility of feeding live birds as prey. Likewise, it was apparent that responses were influenced by personal circumstances, particularly in Adelaide where a number of visitors came from a farming background.

![Figure 7.11: Feeding of live prey to captive carnivores: Level of agreement by pet ownership.](image)

**Source:** 504 surveys.
383 pet owners; 121 non pet owners.
Reference: Appendix Table 7K.
Although comments were not specifically requested in the surveys, any comments that were made were recorded. From these visitor comments, 38% favoured the use of live prey while 62% opposed such usage. It was noticeable that a higher proportion of comments related to the viewer rather than the animal. None of the responses volunteered justification for the feeding of live insects to animals, since there was an acceptance that this was ‘natural’. Two females (both under 20 years), in making reference to the use of feeding insects, commented ‘If that’s what they eat in nature, then it’s O.K.’, but they both disagreed strongly with the use of live fish or rabbits as prey, maintaining that it was ‘not natural’. Among the comments which supported the idea of feeding live prey, 83% related to what visitors deemed ‘natural’ reasons, 10% related to viewing, 4% thought such feeding would be educational, and 3% commented upon animal welfare. Among the responses which disagreed with this type of feeding, 82% related to viewing conditions (particularly involving young children), 9% disapproved generally, 6% related to animal welfare and 4% reflected emotional reactions (Figure 7.12, Appendix Table 7L).

Figure 7.12: Visitor responses in relation to feeding live prey to captive carnivores.

Source: 311 responses.
Reference: Appendix Table 7L.
Overall, the majority of opinions suggested by respondents who favoured such feeding revolved around comments which indicated that this was a natural occurrence. Those who indicated degrees of opposition regarded such feeding as too upsetting to watch, particularly for children. The range of opinions was extremely wide and was exemplified by the following comments.

“It’s what happens in nature, so why not?” (F414).
“I grew up on a farm; I don’t mind seeing that sort of thing” (F221).
“The zoo should make the environment as real as possible” (F435).
“You can see it on T.V., so why not in the zoo?” (F385).
“It would be fascinating to watch” (F374).
“It would add to the educational value” (F347).
“It would need to have careful explanations” (F284).
“It might be what occurs in nature, but I don’t think people would like to see it” (F385).
“It would be very upsetting for the children” (F18).
“I would not like the children to see it; it would be just too upsetting for them” (F190).
“We’re in the older generation; we don’t do things like that” (F4).
“I would not like to see animals killed, that’s not for viewing” (F84).
“They have got to eat I suppose, but I would not like to see it at all” (F31).
“I don’t mind them using live mice, but not birds – they are beautiful creatures” (F116).
“Mice are vermin, but birds and rabbits are cute so you can’t use them” (F414).
“It would not give the carnivore adequate exercise catching prey in small cages” (F132).
“It depends on how quick a kill is made; I would not like to see a slow and painful death” (F1).
“No, it’s a terrible idea, it would be too upsetting and children would not like to see it at all” (F338).
These results indicated that the feeding of live insects to lizards and other reptiles was acceptable to most adult visitors. However any use of live vertebrate prey would need to be approached cautiously. This research also noted that when freshly killed day-old chickens were supplied to the meerkats no negative comments were received. Likewise, there were no perceived problems with the feeding of freshly killed fish to seals and penguins, but only 56% of respondents agreed with the possible use of live fish being fed to the seals. This would suggest that visitors made a clear distinction, even if subconsciously, between the provision of live prey and freshly killed prey.

The results obtained in this research varied from earlier studies by both Ings et al. (1997) and Nelson (2003) (Figure 7.13), particularly over the suggestion of feeding rabbits to lions and tigers. Overall, the present results suggested that a smaller percentage of visitors agreed with the feeding of live insects to lizards and live fish to seals if carried out in view of the public, with similar results also being obtained if the feeding were off exhibit. However, the percentage of visitors who agreed with the idea of feeding live rabbits to lions and tigers was significantly less than that found by the other researchers. This variation may have been the result of the higher proportion of females, many of whom were mothers of young children, who expressed opposition in terms of viewing.

**Figure 7.13: Agreement of visitors to feeding of live prey to captive carnivores.**

*Percentage approval.*

<table>
<thead>
<tr>
<th></th>
<th>On Exhibit</th>
<th>Off Exhibit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UK (a)</td>
<td>AUS (b)</td>
</tr>
<tr>
<td>N=200</td>
<td>N=50</td>
<td>N=504</td>
</tr>
<tr>
<td>Insects to lizards</td>
<td>96</td>
<td>92</td>
</tr>
<tr>
<td>Fish to seals</td>
<td>72</td>
<td>78</td>
</tr>
<tr>
<td>Rabbits to lions</td>
<td>32</td>
<td>38</td>
</tr>
</tbody>
</table>


N= Number of responses.

Ings et al. (1997) pointed out that a different response might have been given if before providing answers, respondents had witnessed the actual feeding of live prey. Throughout the duration of this research this actually occurred on a few occasions, when an animal accidentally entered an enclosure, e.g. a possum with the jungle cat, a possum with chimpanzees and a sparrow in the lion enclosure. On all occasions viewers reacted strongly, suggesting that something should be done to avoid such an event happening; that the prey should be removed from the carnivore or that more care should have been taken by keepers to
avoid such a situation occurring. Two males, one of whom had earlier commented in the survey, ‘no worries with that’ in relation to the hypothetical feeding of live prey, reacted immediately when they saw the golden cat catch and kill a ring tailed possum. In a degree of panic, they asked that a keeper be called immediately to remove and ‘save’ the possum – despite the fact that the unfortunate prey was already dead. They both indicated that they considered such an event should not be seen and that it was ‘not fair’ to the possum. Another male, who had agreed with the use of feeding live rabbit prey to lions, on observing a pigeon fly close to the lioness which precipitated a chase, immediately commented, ‘That shouldn’t be allowed. Shouldn’t the top be wired over so as to stop any birds flying in there and getting caught?’

The hypothetical proposal of feeding of live prey to carnivores held captive in zoos raised serious questions relating to both animal welfare issues and ethical concerns. Survey responses indicated that the majority of visitors agreed with the feeding of live insects and mice, off exhibit, but disagreed with the use of live birds and rabbits, particularly in the exhibit, in full view of the public. More opposition was expressed by females and the younger age sector. Since the majority of visiting groups to the zoo centred on adult females and young children it would seem that in assessing the possible use of live prey, considerable further research is required. In all, 55% of visitors did not approve the use of feeding live rabbits to lions and tigers. The concept was particularly disliked by young mothers who brought their young children to the zoo. The majority of these women based their reasons upon the negative impression that this type of feeding could have upon their children. It was further accepted that the percentage disapproval response would have been even greater if such an event had actually occurred. The majority of viewers agreed with the use of a whole animal carcass, with the only provision being that it should be unrecognisable. No objections were raised to the use of dissected material, since firstly, it had already been killed, and secondly it was unrecognisable. Some visitors justified reasons for their approval of the use of live birds and rabbits, with the most common remarks being ‘it is natural’, ‘it happens in the wild’ or ‘the animals have got to eat’. As opposed to these comments, those who disagreed argued, ‘I would not like to have the children see it’ or ‘it would be too upsetting’.
7.4 Summary

Some zoo critics have suggested that zoos have been misguided in the belief that they serve an educational function (Somer, 1974). These detractors claim that zoos are not educational and that it has even been possible for visitors to leave the zoo with the wrong message. Against this, it has been argued that the general public may not come to the zoo seeking to be educated, but that it is possible that they might leave having received some education, without having realised that their new understanding had been powerfully affected by their experiences. Survey responses indicated that when visitors observed an animal manipulating an enrichment device, or became aware of various different behavioural patterns demonstrated during the keeper talks or in shows, the experience was so stimulating and thought-provoking that the potential existed for the visitors to extend their understanding and develop their learning (Chapter 5).

As visiting groups looked at the different exhibits in the zoo, their patterns of viewing behaviour were influenced by variables similar to those which play a role when people look at museum exhibits. However, one major difference between these two institutions related to the overall design of exhibits, since the design of zoo enclosures must, of necessity, allow for the minimisation of stress to captive animals which are alive and active. The South Australian Museum in Adelaide displays a series of impressive displays of mammals from around the world, the majority of which originated from the Adelaide Zoo (Plates 7.24, 7.25). In this exhibit, animals from geographical regions are positioned together, with no thought being given to spatial or biological requirements. The animals in these museum displays no longer require the constant care and attention needed in zoos on a daily basis. Since many natural history museums now include live animals in their exhibits, the distinction between the museum and the zoo environment is now more blurred than it once was.
The question remains as to why the majority of visitors to zoos do not stop to read the signage displayed at an exhibit. Although similar patterns have been observed in museums and other similar institutions, visitors may have been reading small sections of the label as they moved past without stopping. McManus (1987:265) pointed out that a visitor can read up...
to 20 words in five seconds as he or she walks towards an exhibit, without an observer being aware that any reading is taking place. Consequently, though visitors might have appeared not to be reading the text they may have been scanning it, searching for possible cues which might help them decide if they wished to stop and spend additional time reading further details.

Discovering which exhibits and signs visitors were sympathetic to, and which features attracted attention is a key to improving visitor understanding. The new style of labels in Adelaide indicated one way to attract visitor attention, although (as seen with the snow leopard label at Taronga) positioning at, or near, eye level was most important. Peart (1984) showed that by adding labels, pictures and sound to animal exhibits, as well as the visitor viewing time being approximately doubled, there was a knowledge gain, which was measured by questionnaire. Bitgood et al. (1987) found that similar increases in viewing times occurred by varying the placement, length and style of labels. The amount of information contained in descriptive labels at different exhibits has been shown by several researchers to influence visitor attention. In particular, label characteristics have been extensively studied (Bitgood et al., 1990), and Serrell (1996b) has incorporated much of this literature in her guide to designing labels. Data collected in zoos has produced similar results to that collected in museums; for example, Bitgood et al. (1990) determined that the impact of label placement on visitors was the same for both the zoo and the museum, and Bitgood and Patterson (1992:15-17) found that by giving visitors a handout with questions (answers to which were contained in the exhibit label), reading was increased at both the zoo and the museum. Unfortunately, the fact remains that in the present research the majority of labels were not read, and although they formed an excellent basis for providing education for viewers their contribution was too often totally ignored.

Different attitudes towards enrichment led to the potential for misinterpretation. In terms of visitor education, it is important to consider the way in which the average zoo visitor perceives the uses of such artificial devices. The interpretation of different objects can be classified according to their effect on the viewer, since each exhibit involves a different need of the viewer and stimulates different behavioural patterns. One of the aims of using novel objects as forms of enrichment has been the development of a wider range of animal behaviours and activities. If these additional actions positively attract visitors, and increase visitor interest and enjoyment, this would suggest that there is a potential for visitor education
(Shettel-Neuber, 1989) which would ensure that visitors gained a better understanding of the animals and experienced enhanced pleasure and enjoyment from their zoo visit.

Visitors to the zoos were both entertained and intrigued by the different activities of animals when they saw the animals playing with or manipulating various enrichment items. Although the majority of visitors were initially unaware of the various enrichments present in an enclosure, once the animal started interacting with the enrichment visitors stayed for longer periods of time and subsequently began to consider possible reasons for the provision of various enrichments. As visitors recognised different patterns of animal behaviour, they assimilated new information and accommodated old ideas to fit new realities. Thus, the visitors’ overall experience was enriched and enhanced, with the resultant thinking being extended in a process that forms the very essence of learning. It is concluded that the use of enrichments was important, not only for the benefit of the animal, but also for the public in the provision of devices that help viewers develop a better understanding of the animals they see.

The list of various enrichments is endless. The enriched exhibit may contain a variety of natural flora and fauna along with artificial items, to maximise behavioural opportunities. Examples of enrichment items varied widely, being dependent upon the animal and the behavioural pattern being considered. They included the provision of such items as Sampson toys on a bungee rope to promote group feeding among lions; termite mounds for chimpanzees to encourage their tool-making activities; hanging treat logs enriched with honey to encourage activity in the sun bears; fish frozen into ice blocks for otters and tyres from jet aircraft to encourage playful activities with elephants. Scattering an animal’s daily rations around its exhibit, freezing its food into blocks of ice, or hiding it rather than simply placing it in a bowl, all form an effective component of both environmental and behavioural enrichment (Shepherdson, 1998:2). Feeding enrichments not only overcame lack of stimulation by providing animals with something to occupy their attention, they also successfully diverted animals from engaging in behaviours which at times viewers interpreted as being related to boredom. Visitors tended to regard these interactions with enrichments as natural activities and assumed that the animal was better cared for and that it was no longer bored.

It was evident that the presence of enrichment in various enclosures could give rise to some misconceptions and misinterpretations in the minds of some of the viewing public. Some visitors considered certain devices artificial or non-natural junk; others believed that if
an animal played with these non-natural items its behaviour was abnormal; still others thought that the enrichments had been placed in the animals’ enclosure solely for the benefit of visitors. A small but significant number of zoo visitors perceived animal training and conditioning as cruel, or as examples of exploitation, and did not accept that many animals actively co-operated in training or enjoyed developing skills. However, the majority of viewers agreed that the use of enrichment items was beneficial for the animals. By gaining an indication of the way the average viewer perceived devices such as old tyres, milk crates and manufactured items, valuable information relating to the perceptions of zoo visitors was acquired.

Although carnivores are perhaps the hardest group of animals to provide for in a naturalistic manner, it should not be forgotten that animals need to spend time in the wild finding their food resources. Within the zoo environment these behaviours are not needed and this has been one of the reasons for developing the use of enrichments. In theory, visitors tended to agree with the use of live prey for the feeding of carnivores, but the level of agreement decreased with the increasing complexity of the prey animal and the majority of visitors did not wish to see more complex animals, such as rabbits, being fed to lions and tigers. It appears doubtful that feeding live prey to carnivores would serve any valid educational purpose that would not be covered through the use of enrichments with animals. However, the results of this research suggest that feeding sessions for animals in the zoo could be used to enhance informal learning, with the development of effective programmes to interest visitors of all ages.

This research indicated the importance of zoo administrators’ consideration of visitors’ expectations on topics such as the feeding of live prey to carnivores, particularly since these give an insight into the levels of understanding of visitors. As they considered the prospect of such feeding, visitors formulated their ideas from their existing perceptions of animal requirements, although such perceptions may have been based on false assumptions, without knowledge of the particular animals or their behavioural patterns. By researching such topics, further understanding of visitors can be developed, putting zoos in a better position to improve the knowledge and education of their visitors. For example, the results suggested that it would be preferable for zoos to provide enrichment items rather than live prey for carnivores. When animals such as Tasmanian devils are supplied with fresh pieces of meat hidden within paper piñatas, visitors can observe a wider range of behavioural patterns than would be observed with the use of live prey. Similarly, when the lions at Taronga were
supplied with meat in their Sampson toy, the pride ‘killed’ their ‘prey’ in a united attack, which resulted in viewers not only remaining at the exhibit for longer periods of time, but also asking a number of questions, reflecting a marked increase in the potential for education.

As a gathering place, the zoo is a museum which has the potential to provide its visitors with more than just some simple information provided on a label or mentioned in some information brochure. It is possible for people to learn in the zoo environment from seeing things they already know and about which they learn more. Consequently they develop deeper levels of understanding and see new meanings, according to what they perceive. Screven (1986b:123) wrote, ‘Museum learning is self-paced, self-directed, non-linear and visually orientated’. This statement could equally have been applied to zoos and the way in which various exhibits attract an audience. The zoo is not a school classroom where enforced learning is developed through authoritarian leadership over well-defined social units. With the exception of visiting school groups, zoo audiences were made up of unrelated social units which displayed considerable variations in their levels of knowledge. These visitors moved through the zoo and followed their own agenda as they stopped to look at the exhibits that appealed to them. They viewed, what they liked, for as long as they wished.

Given the relative visitor ignorance of the benefits of enrichment, there exists a vast potential to use the attracting and holding power of enrichments for educational purposes. Initially, visitors failed to recognise enrichment items. Once visitors observed the animals’ use of the items they readily appreciated the concept of enrichment, even though they may have lacked a sophisticated understanding of enrichment principles. The educational value of animals in zoos is directly related to them displaying their normal patterns of behaviour (Young 2003), and the aesthetics of presentation concern not only the visual appearance of the enclosure, but also the appearance of the animals’ behaviour.