

# An Investigation into Colour Preference in the Spotted Bowerbird (*Chlamydera maculata*)

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## Abstract

Bowers of the spotted bowerbird are frequently decorated with a variety of natural and man-made coloured objects, depending on availability and, possibly, preference. In order to investigate colour preference, birds in Taunton National Park, Queensland, Australia, were presented with a choice of counters in 6 different colours. The investigation showed strong interbird variation in preference and little uniformity in colour preference or rejection. Forced exposure to a colour did not seem to alter the preference for this colour.

## Introduction

This experiment was carried out in Taunton National Park, a purely scientific park located at 200 km west of Rockhampton, in Queensland, Australia. Taunton is a designated National Park of 26 000 acres set up for the conservation of the bridled nailtail wallaby (*Onchyogalea lunata*). The brigalow regrowth favoured by this species is also favoured by spotted bowerbirds and thus there are numerous bowers on the park. Within Australia, 18 different bowerbird species are found, all known for the construction of bowers; they are species-specific constructions for the sole purpose of mate attraction. The spotted bowerbird decorates its bower with coloured objects, usually berries, but including man-made objects such as glass and plastic where found. The decorations are mainly green. Little is known about the elasticity of bowerbird colour preference. In order to investigate whether the preference for green objects is exclusive, and whether it can be influenced, this colour choice experiment was devised.

## Methods

All bowers were previously located on the park by Ms Rebecca Coe. The investigation was split into the following parts:

### **1) Alien colour introduction**

- Circular plastic counters of the following colours were used: purple, light blue, dark blue, gold, yellow and orange. A pile of 30 counters, 5 counters of each of the colours, was placed at 1 metre distance from the bower on a day within the period 07.09. to 11.09. at a total of 10 bowers.
- The bowers were observed for 90 minutes following the deposition of counters. Any activity was noted. Movement of counters was recorded to the nearest cm as the position from both the original pile and the bower entrance.
- Bowers were checked on the following two days. The location of all of the chips was recorded. All chips were removed after approximately 48 hours.

### **2) Forced colour exposure**

- 10 bowers were selected for treatment according to location, thus that treated bowers approximately alternated with untreated. 5 purple counters were fixed onto a 10cm x 10cm board of wood and nailed down into the avenue of the bower on the 18.09. This forced exposure was regularly checked to ensure counters had not been removed or covered up.

### 3) Counter removal and investigation into habituation and selection change

- The chips were removed after 21 days.
- Step one was repeated at all bowers on the following dates: 16.10. - 23.10.
- Counter positions were compared to initial exposure in order to investigate any change in colour preference due to forced exposure to purple counters.

## Results

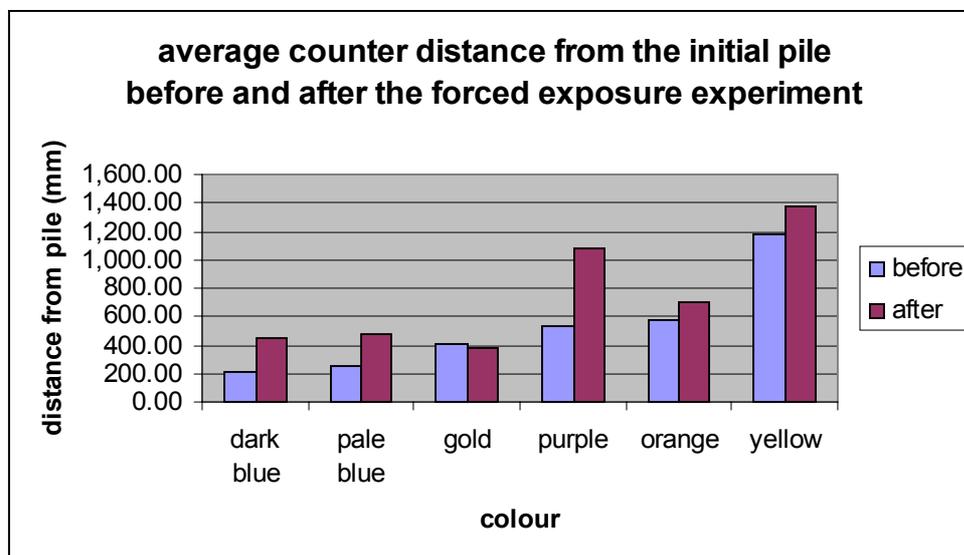
1) All birds moved counters from the pile, but intensity of movement and time taken until first movement varied strongly. Some birds moved the counters during the first 90 minute observation (30% at methodological step 1, 25% at step 2); others had only moved any after 48 hours.

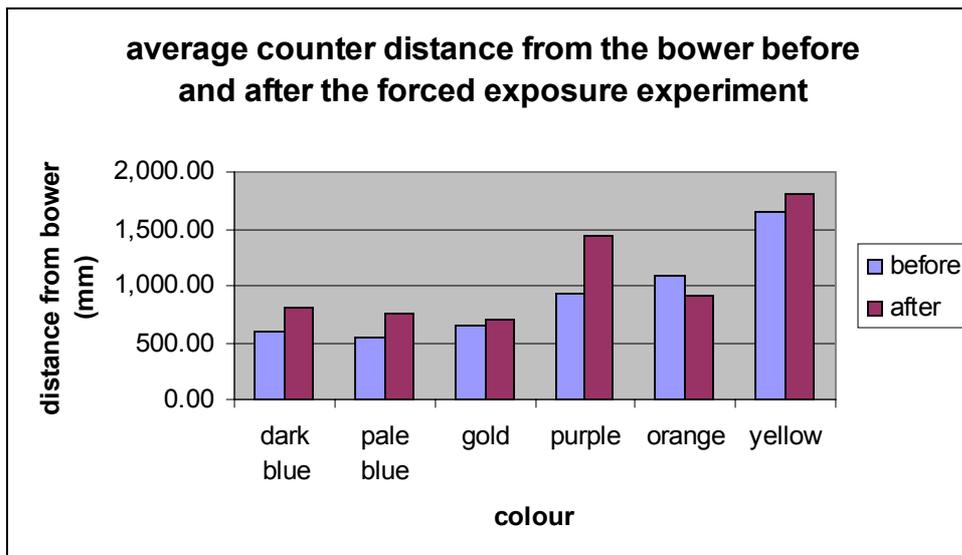
2) The colours preferred and rejected varied strongly between bowers. Gold was mostly preferred, often integrated into the bower decoration or walls. Yellow was mostly rejected, thus moved further away from the bower. Although the blue chips had the lowest overall distance from the bower after movement (see table 1), purple was the most uniformly accepted colour, mainly left close to the pile, and was thus chosen as the colour for forced exposure to minimise interbird preference.

	Mean distance from Pile (mm)	Mean distance from Bower (mm)
dark blue	208	596
pale blue	246	545
gold	407	650
purple	538	925
orange	581	1085
yellow	1175	1648

Table 1: Mean distance of counters in mm after initial 48 hours, given per colour.

3) The repeated exposure to all colours after the forced exposure yielded the following results:





almost all colours were rejected more strongly. Noticeably, purple was removed further from the bower and the pile than before.

Yellow was again most strongly rejected.

## Discussion

1) The amount of chips moved immediately after initial exposure is dependent on the presence of the bird, which varied widely, with a number of birds not present at the bower throughout the initial 90 minute observation. Furthermore, the visibility of the counters, influenced by radiation, local growth and even distribution of the colours within the pile, may have influenced the bird's response.

2) One can only speculate as to the reasons for the preference of certain colours. Gold may appear very natural, but shiny, which could explain that it was seldom strongly rejected, and often integrated into the bower walls, as shiny green objects are also strongly preferred. Yellow was often rejected, possibly as it is a colour never found near the bowers in such intensity. Another explanation may be that old solanum berries turn yellow and are rejected from the avenue when they are old. Blue chips were sometimes rejected very strongly, but had the closest mean distance after initial exposure. It may be that blue resembles green to some birds, while the unnaturalness is often rejected.

3) the statistics seem to indicate a stronger rejection of the purple chips after the forced exposure experiment. This may indicate that their preference for the colour was inversely affected by the experiment. It could also indicate a stronger awareness for counters of that colour by forced exposure with no effect on the preference. Furthermore, the other colours were also moved more, therefore the increase in movement of purple counters may be in line with the general increase. Statistical tests are needed to investigate the change further, a paired t-test would be of help. Methodological problems – the variety of colours used was not only due to the desirability of investigating a wide range, but also limited by colour availability. The initial proposal suggested using orange and pink. Furthermore logistic constraints prevented all exposure to occur on the same day. The counters had to be put out on different days and thus variation in the weather may have influenced the birds' reactions.

