Title of article: **Practical guidelines for selecting insects as flagship species for the Beverin Nature Park in Switzerland. A survey of local school children on their attitudes towards butterflies and other insects**

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Abstract

The management of the Swiss regional nature park of Beverin in the canton of Grisons is interested in establishing insects as flagship species to promote the Schams Mountain ("Schamserberg") ecosystem and wants to base the decision process on quantitative research.

A survey on attitudes towards insects was designed and then completed by 331 local pupils, aged 8 to 16. The standardized questionnaire presented 11 adult butterflies/moths, 4 caterpillars and 7 other insects individually in a color photograph, and asked how pretty, interesting, disgusting or fear-inducing the species were. Additionally, the underlying reasons in terms of an animal's color, pattern, body feature, or movement and sound were sought.

The results add details to existing research and can serve as helpful information for both the creation of environmental education programs and the selection of resident insects as flagship species. The expected positive perception of butterflies/moths was confirmed, while other insects were perceived as interesting and, if colorful, even pretty. In general, children noticed color details. For levels of disgust, body features were important, while color and pattern were mainly irrelevant. As attitudes differed and became more negative as the age of participants increased, it is recommended that environmental education starts early and is target-group specific.

Most of the insect species studied are appropriate as flagship species, based on their prettiness or interest they attract. The final choice also depends on the accessibility of their actual habitat. As a next step, the Beverin Nature Park is advised to conduct further focused research on the specific distribution of the potential flagship insects within the park borders. On this basis, appropriate nature trails could be established with emphasis on environmental education.

Introduction

The Beverin Nature Park in Switzerland includes 12 communities with around 2,500 people. It spreads over 373 km^2 in the canton of Grisons (see Figure 1). Besides its forests, wet meadows, floodplains and fens, its dry and poor grasslands are of special importance. These extensively managed dry meadows and pastures cover 5.6 km^2, of which the Schams Mountain ("Schamserberg") is the largest and most prominent area (Forster et al. 2008).

Copyspace Figure 1

The park management has considerable interest in nature conservation. They aim to sustainably manage biodiversity and focus on entire ecosystems, including their ecological processes. To gain support, targeted approaches towards the local residents and school children are considered important stepping stones. As part of their communication and environmental education strategy, the park management wants to establish insects as flagship species for the respective habitats. This approach is in line with current research (Schlegel et al. Submitted, Dennis et al. 2007, Munoz 2007, Simberloff 1998).

The park management's strategy is fueled by the trend in nature conservation to use flagship species as communication and marketing tools (Walpole and Leader-Williams 2002, Samways et al. 1995). Increasingly, invertebrates and especially insects are considered appropriate and necessary flagship species (Barua et al. 2012, Guiney and Oberhauser 2008) not only to support their own conservation as major contributors to biodiversity (Hammond 1995, Black et al. 2001, Mora et al. 2011), but also to enhance awareness of their contribution to ecosystem services (Losey and Vaughan 2008).

The park management therefore asked the authors to conduct a quantitative survey involving the local schools in order to establish which insect species were feasible candidates for flagship species in terms of being pretty and interesting while not triggering disgust or fear. As prerequisites, the species should (i) have a German common name without negative connotations (Shardlow 2013, Berenbaum 2008, Bowen-Jones and Entwistle 2002), (ii) be local (Genovart et al. 2013), (iii) play an important ecological role (Shardlow 2013), (iv) be easily identifiable to promote direct encounters (Barua et al. 2012), and (v) be endangered or rare (Knegtering et al. 2002). Prerequisites (ii) and (iii) ensure that the species chosen have particular habitat preferences and are thus suitable to act as representatives of the Beverin habitats.

Methods

Principals and teachers of 75 classes at 20 schools in the Beverin catchment area were contacted, a cover letter signed by the Beverin park management being included. 22 classes at 8 schools responded,

resulting in the participation of 331 pupils. The 164 boys and 167 girls were 3rd to 9th graders, aged 8 to 16 (mean 12.19 yrs, S.D 2.16 yrs). The 175 children aged from 8 – 12 (mean 10.4 yrs, SD 1.2 yrs) were defined as “pre-teens”, while the 156 children aged 13 – 16 (mean 14.2 yrs, SD 0.9 yrs) were specified as “teenagers”.

The standardized questionnaire presented 22 separate color photographs of 11 adult butterflies/moths (“butterflies”) and 11 other insect species, which included 4 butterfly and moth caterpillars (“caterpillars”) (see Table 1). All species were found in the Beverin Nature Park, based on data provided by the Swiss Biological Records Center (Centre Suisse de Cartographie de la Faune – CSCF), the oldest dating from 1989 (Bumble bee species *(Bombus mesomelas)*) and 1998 (Scarlet Tiger Moth *(Callimorpha dominula)).* The species were selected to represent the various habitats while displaying different colors, patterns and body shapes. A German common name was required and their appearance on the Swiss Red Lists of endangered animal species was desirable (Monnerat et al. 2007, Gonseth and Monnerat 2002, Gonseth 1994).

Copyspace Table 1

The questionnaires, designed for easy comprehension, were sent to the schools participating in paper form. Each class received half of the forms with the species in reverse order to counter-balance potential effects of weariness. The forms were filled out during lessons, teachers having been instructed only to answer pupils' questions which related to proper understanding.

The pupils had to rate each species on an ordinal 5-point Likert scale in 4 categories. To allow for equidistant responses, only the outer boxes were labeled, as follows:

(i) very pretty - very ugly *[sehr schön – sehr hässlich],*
(ii) very interesting - very boring *[sehr interessant – sehr langweilig]*,
(iii) very pleasant on my hand - very disgusting on my hand *[sehr angenehm auf meiner Hand – sehr eklig auf meiner Hand],*
(iv) I feel very confident with this animal - I am very afraid of this animal *[Ich habe grosses Zutrauen zu diesem Tier - Ich habe grosse Angst vor diesem Tier].*

The phrasing of the labels were discussed with a teacher and the questionnaire pre-tested with 12 children aged 8 – 16 (mean age 11.75, S.D. 2.13). The categories chosen were based on current literature, where disgust is aroused through touch (Miller 1997, Herz 2012), and confidence used as a counter-term for fear (Weiss 2012).

The pupils were also asked to give the reason for their score per category. They could choose between “color”, “pattern”, “body (form, hair, legs, wings)” and “movement / sound”, and place up to 4 ticks. Where color was a reason in any of the categories, the most important color was indicated.

To analyze the data collected, the following scores were assigned to the responses: very positive = 5, fairly positive = 4, neutral = 3, fairly negative = 2, very negative = 1.

Although treating ordinal Likert scales as integral data is controversial (Lant 2013, Jamieson 2004), it is commonly done in research (Lindemann-Matthies 2006). We assumed equidistance to calculate the means for the attitude categories and tested the resulting rankings for correctness using Wilcoxon rank and Kruskal-Wallis rank sum tests. The Wilcoxon rank test was also applied to establish the effect of gender, age group (pre-teen vs teenager), and differences between pairs of insects (i.e. 2 caterpillars, 2 dragonflies and 2 grasshoppers). Significant differences were accepted with $p < 0.05$. The statistical analysis was performed in the R statistical environment (R Project 2013, R Foundation of Statistical Computing 2013).

Results

The high response rate (29% of the teachers) was most likely due to the close involvement of the Beverin park management, the positive reputation of the park, and subsequent high willingness to support the park management’s aims. With 331 questionnaires, split evenly between male and female as well as pre-teen and teenage respondents, we consider our results solid and meaningful. The sample size is in line with or higher than similar studies (Ballouard et al. 2001, Randler et al. 2012, Balmford et al. 2002, Schlegel et al. Submitted).

The species' mean values were ranked by category, with butterflies coming first in all categories and forming their own cohort. Only the butterfly-shaped Owly Sulphur (*Libelloides coccajus*) was among the butterflies in the "Pretty – Ugly" and the "Interesting – Boring" categories (see Figure 2). Furthermore, the ranking for prettiness was steeper than that of interest, ranging from 4.6 – 2.1 and 3.9 – 2.5 respectively. The significance of the species' ranking order was confirmed by the Kruskal-Wallis rank sum test. That butterflies and other insects formed significantly separate cohorts was established with the Wilcoxon rank test.

Copyspace Figure 2

The 2 black caterpillar species, the 2 dragonfly species and the 2 grasshopper species were compared pair-wise for significant differences. They share similar body features and ways of movement but differ in pattern and color respectively. The Wilcoxon rank test showed significant differences in all categories for the caterpillars selected and in all categories except for the "Interesting – Boring" category for the dragonflies. The grasshoppers achieved significant differences in the category "Pretty – Ugly" and "Confidence inspiring – Fearsome" (see Table 2).

Copyspace Table 2

Gender was confirmed as a significant differentiator in attitudes towards butterflies by the Wilcoxon rank test. The respective mean scores were significantly higher for girls in all categories except "Confidence-inspiring – Fearsome". When examined for the other insect species, significant gender differences appeared except in the category "Interesting – Boring", as girls tended to rate the non-butterfly species more negatively than boys in terms of prettiness, pleasantness and fearsomeness, but not less interesting (see Table 3). Testing by age group resulted in significant differences between pre-teens and teenagers in all categories for butterflies and other insects.

Copyspace Table 3

Discussion

The 11 butterflies fared well in all categories tested, while the 2 dragonfly species only reached the lower ranks. These findings confirm the intrinsic appeal of butterflies, which symbolize pleasure and beauty in life (Lewis et al. 2007, Kühn et al. 2008). They are in line with Schlegel and Rupf (2010), who also found consistently positive ratings for butterflies and rather negative ones for other insects, but not in complete agreement with statements regarding dragonflies made by Samways (2013) and Lemelin (2007). Choosing the White Faced Darter *(Leucorrhinia dubia)* as "Dragonfly of the Year" for 2014 seems timely and desirable (BUND 2014).

The children's remarks on colors show that they are detailed observers. Marginal and contrasting colors were also given as motivation for certain attitude scores (seeFigure 3). As a result, the color scores per species appear to reflect the actual color distribution of the respective animal, with considerable weight at times for the contrasting color. The red-pink fringe of the Moorland Clouded Yellow *(Colias palaeno)* accounted for 13% of its color scores from the pupils, and the orange dot on the tail of the White Faced Hawker 10%. With butterflies, brightness seemed to be more important than pattern, as can be seen in the lower prettiness ranking of patterned species such as the Scarce Swallowtail *(Iphiclides podalirius)* and the Scarlet Tiger Moth *(Callimorpha dominula).* Conspicuous coloring can strongly support positive reactions towards animals, including invertebrates (Prokop and Fančovičová 2012).

Copyspace Figure 3

The motivation behind the attitude scores and resulting rankings for the butterflies and the other insects was examined. Not surprisingly, butterflies were perceived as pretty mostly due to their color and pattern, and as pleasant because of their body features and movement / sound. Regarding the other insects, color was an important driver of prettiness, while body features were the major reason for ugliness. In the "Interesting – Boring" category, movement / sound and body features had considerable effect on both positive and negative attitudes. Furthermore, negative perception of body and movement / sound were major reasons for disgust scores (see Figure 4). Certain body shapes cause negative associations and infer that the particular insect lives only on and in the ground (Shepardson 2002), which in itself is viewed negatively (Hillman 1988). Insects that creep and crawl on the ground instigate disgust, most probably because of slithery movements or their slimy body surface (Herz 2012). Wet, slimy, oily, gooey and squishy are qualities of consistency and touch that trigger disgust (Miller 1997), which relates to fear of

contamination where invertebrates are concerned (Arrindell 2000). It seems reasonable that movement and body are mentioned as drivers of disgust as disgust is about touch and skin (Miller 2004, p. 17) and antennae are rather unpopular body features of insects and bugs (Shepardson 2002). These features are symbols of *otherness*, which is a driver of disgust (Miller 2004, p. 17). At the same time, what disgusts can actually be perceived as interesting: *"Aversive as it is, but one of the enigmas of disgust lies in the fact that the emotion can also attract; therefore the occasions when it beckons and facilitates are especially intriguing" (Korsmeyer 2011, p. 18).*

Copyspace Figure 4

The differences in attitude scores for the selected pairs of the other insects seemed to be mostly driven by color (see the dragonfly example in Figure 5). Generally, a yellow-black combination in nature serves as a warning for predators (Braitenberg 2009), while red is an attention-grabbing color (Gnambs et al. 2010). In our study, the yellow-black pattern of the Scarlet Tiger Moth Caterpillar *(Callimorpha dominula)* gave the species high positive scores when compared to the pure black Fritillary Caterpillar *(Boloria sp.).* Furthermore, due to its red coloring, the White Faced Darter *(Leucorrhinia dubia)* received higher prettiness scores than the Azure Hawker *(Aeshna caerulea).* Aposematic species are more likely to trigger positive emotions compared to duller or colorless species (Prokop and Fančovičová 2012). However, the pupils' reasons did not offer further explanation for the differences in their rankings of the 2 grasshoppers.

Gender differences were found as girls awarded higher positive scores than boys towards butterflies, in line with (Schlegel et al. Submitted). The "Confidence-inspiring – Fearsome" category was an exception, most probably because butterflies do not generally induce fear. Tikka et al (2010) showed that female students have more positive attitudes towards nature. At the same time, the lower scores female pupils awarded to the other insects in our study were in line with research in which girls rated invertebrates unfavorably, perceiving them as less lovable, disgusting or threatening (Schlegel and Rupf 2010, Prokop and Fančovičová 2012, Kellert 1993). Our findings build on those of Schlegel et al (Submitted), who identified 8 "male species" that gained significantly higher attitude scores from boys than from girls, the higher scores possibly being driven by the boys' lower perception of fear and disgust, and higher perception of beauty.

Pre-teens generally show more enthusiasm than older age groups and award the highest scores more frequently. We looked at the motivations for the Scarce Swallowtail *(Iphiclides podalirius)* and the bumble bee species *(Bombus mesomelas)* to better understand the significant differences in attitude scores between pre-teens and teenagers. 35% - 80% of the scores awarded by pre-teens were "very positive" scores, while the teenagers' scores were more prominently in the "fairly positive" value range. An even more precise picture emerged for the bumble bee as teenagers gave only few "very positive" scores and "very negative" ones occurred in substantially higher numbers. Lindemann-Matthis (2006) worked with children aged 8 - 16 and described how interest in activities with plants and animals continuously decreased with age, while preference for outdoor education increased. Our findings are in line with Kellert, who showed that children between 6 and 12 years of age relate to the physical attraction of nature (aesthetic value), form an emotional bond with it (humanistic value), are curious about the different-ness of nature, and are keen to gain an understanding of it (knowledge value). Teenagers aged 13 – 17 relate to nature on ethical grounds (moralistic value), want to discover nature (naturalistic value) and understand its ecology (scientific value) (Kellert 2002). As our questionnaire was also used by 8-year olds, it had a simple design, which might not have provided enough opportunity for older pupils to give fuller information.

Outlook

The aim of our study was to provide a quantitatively based rationale for selecting insects as flagship species for the major habitats in the Beverin Nature Park. While we cannot recommend a particular insect species at this point, we can provide substantially better understanding of motivational aspects driving attitudes to insects. Prettiness is significant driver, but color is also important and can help to overcome negative attitudes towards insects. Body features are a further major driver of both positive as well as negative attitudes, especially in terms of pleasantness or disgust.

However, especially for insect species other than butterflies, their interesting aspects should be exploited and promoted more intensively as interest also affects attitudes. As shown by the rankings, interest is of impotence, and scored higher than prettiness at the lower end.

Environmental education could make use of storytelling to change attitudes towards insects (changingminds.org 2013), a strategy increasingly applied in PR (Herbst 2008) and campaign management (personal communication M. Diethelm, Kampagnenforum CH, June 7, 2013). Originality is a relevant aspect of fauna (UNA 2011), which could be leveraged more effectively by using drama in a narrative with a climax. Examples for exercising “Metamorphosis” or “Underdog” plots (Tobias 1993) could be the Large Blue *(Maculinea arion)* with its dependency on Myrmica ants (Lepidopterologen-Arbeitsgruppe 1994) or the Rattle Grashopper (*Psophus stridulus)* with its glimpses of a hero when flying and exposing its red hindwings. The stories should be told in such a way that the recipients can relate to them (Blaustone 1992), include an element of surprise or humor (Gálvez 2012), and inspire people to action (Woodside et al. 2008). Storytelling has motivated girls to take on previously unpopular tasks and is therefore powerful (Kelleher et al. 2007). Thus, storytelling could be used to possibly overcome overt as well as subliminal disgust.

As children become more critical and less enthusiastic with age, environmental education should start early (White 2004, Wilson 1996). The Beverin nature experience programs should include self-experience and discovery themes on ecology to cater especially for teenagers (Herrmann 2004, Chawla 2006, Kellert 2002, Bögeholz 2006).

To give visitors of all ages a real life experience and to decide which story to tell and how (e.g. through signage or via scavenger-hunt like sign posts), Beverin Nature Park needs to ascertain which areas of the park the respective insects inhabit. A second research project should be launched to determine where the candidates can be experienced from existing paths and hiking routes or from future nature education trails in the Schams Mountain region.

A final decision on the choice of insect as the flagship species seems feasible based on both the observation data and the attitude data gained in this study.

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Tables and Figures

Figure 1: Location and borders of the Beverin Nature Park in Switzerland. The park management office is located in Wergenstein at 46° 37’ N, 9° 24’ E.

Table 1: List of the 22 insects evaluated, including their Swiss Red List* status and main habitat, sorted by scientific name in alphabetical order (Lepidoptera, Neuroptera, Hymenoptera, Orthoptera, Odonata, Coleoptera).**

Photograph used in questionnaire	*Scientific name*	Common name in English and German	Swiss Red List status*	Habitat **	Photograph used in questionnaire	*Scientific name*	Common name in English and German	Swiss Red List status*	Habitat **
	*Aporia crataegi*	Black Veined White Baumweissling	3 – endangered	1, 6, 7		*Boloria sp. ****	Fritillary Caterpillar **** Raupe Perlmutterfalter ****	3 - endangered	2, 3, 7
	*Callimorpha dominula*	Scarlet Tiger Moth Schönbär	4 – potentially endangered	5, 6, 7		*Callimorpha dominula*	Scarlet Tiger Moth Caterpillar Raupe Schönbär	4 – potentially endangered	5, 6, 7
	*Callophrys rubi*	Green Hairstreak Brombeer-zipfelfalter	3 – endangered	1, 2, 5, 6, 7		*Melanargia galathea*	Marbled White Caterpillar Raupe Schach-brettfalter	Not listed	1, 6, 7
	*Colias palaeno*	Moorland Clouded Yellow Hochmoor-gelbling	3 – endangered	4, 6		*Zygaena viciae*	New Forest Burnet Moth Caterpillar Raupe Kleines Fünffleck-Widderchen	Not listed	1, 2, 6, 7
	*Iphiclides podalirius*	Scarce Swallowtail Segelfalter	2 - strongly endangered	1, 6		*Libelloides coccajus*	Owly Sulphur Libellen-Schmetterlings-haft	3 - endangered	1
	*Lasiommata petropolitana*	Northern Wall Brown Braunscheck-auge	3 – endangered	1, 6		*Bombus mesomelas*	Bumble bee species Berghummel	3 - endangered	1
	*Lycaena virgaureae*	Scarce Copper (m) Dukatenfalter (m)	3 - endangered	1, 7		*Decticus verrucivorus*	Wart Biter Gemeiner Warzenbeisser	NT – near threatened	1, 2, 3
	*Maculinea arion*	Large Blue Schwarzfleckiger Ameisenbläuling	3 – endangered	1		*Psophus stridulus ****	Rattle Grasshop-per*** Rotflügelige Schnarrschrecke ***	VU – vulnerable	1
	*Melitaea asteria*	Little Fritillary Kleiner Scheckenfalter	4a – potentially. endangered	1, 2		*Psophus stridulus ****	Rattle Grasshop-per *** Rotflügelige Schnarrschrecke ***	VU – vulnerable	1
	*Melitaea cinxia*	Glanville Fritillary Gemeiner Scheckenfalter	2 – strongly endangered	1, 6, 7		*Aeshna caerulea*	Azure Hawker (f) Alpen-Mosaik-jungfer (w)	VU – vulnerable	3
	*Parnassius apollo*	Apollo Apollo	3 – endangered	1		*Leucorrhinia dubia*	White-faced Darter (m) Kleine Moos-jungfer (m)	NT – near threatened	4
						*Gaurotes virginea*	Beetle species Blaubock	Not listed	7

** Source:* (Gonseth 1994, Gonseth and Monnerat 2002, Monnerat et al. 2007).
*** Habitat: 1: Dry poor grasslands, 2: Wet grasslands, 3: Fen, 4: Raised Bog, 5: Wetlands & meadows, 6: Bushes & shrubs, 7: Forest edges & glades*
**** Rattle Grasshopper (Psophus stridulus) was shown with 2 different photographs in the 2 versions of the questionnaire. Differences in responses were not evaluated.*
***** The habitats of the Fritillary Caterpillar species are given for the Small Pearl-bordered Fritillary (Boloria selene).*

Note: All photographs as shown in the questionnaires, except for theWart Biter (*Decticus verrucivorus)* and the White Faced Darter *(Leucorrhinia dubia),* for which very similar photographs were used.

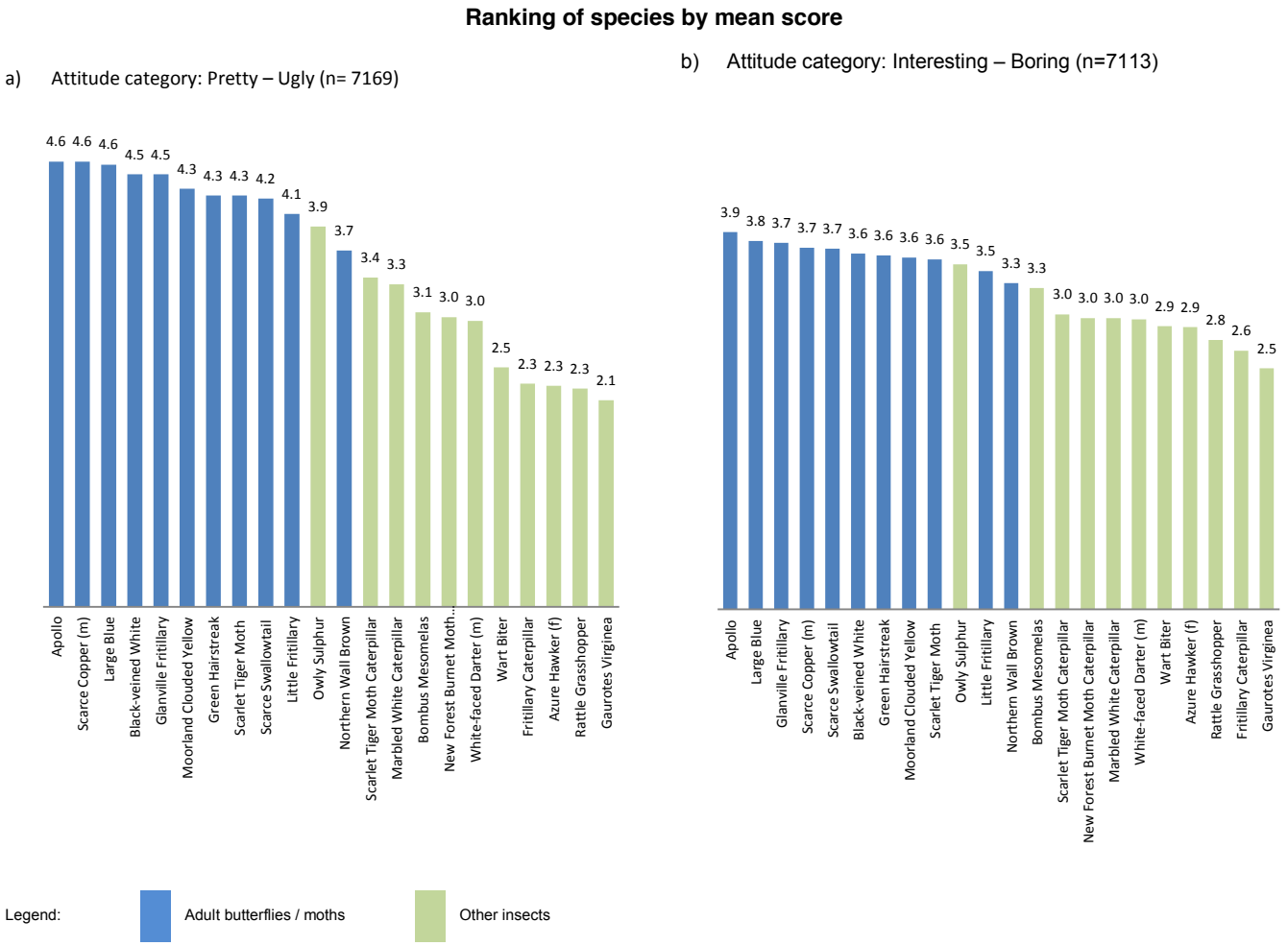

Figure 2: Ranking of 22 species by mean score value in the categories "Pretty – Ugly (1a), "Interesting – Boring" (1b), with 5 being the most positive and 1 being the most negative value. Ranking based on 331 questionnaires.

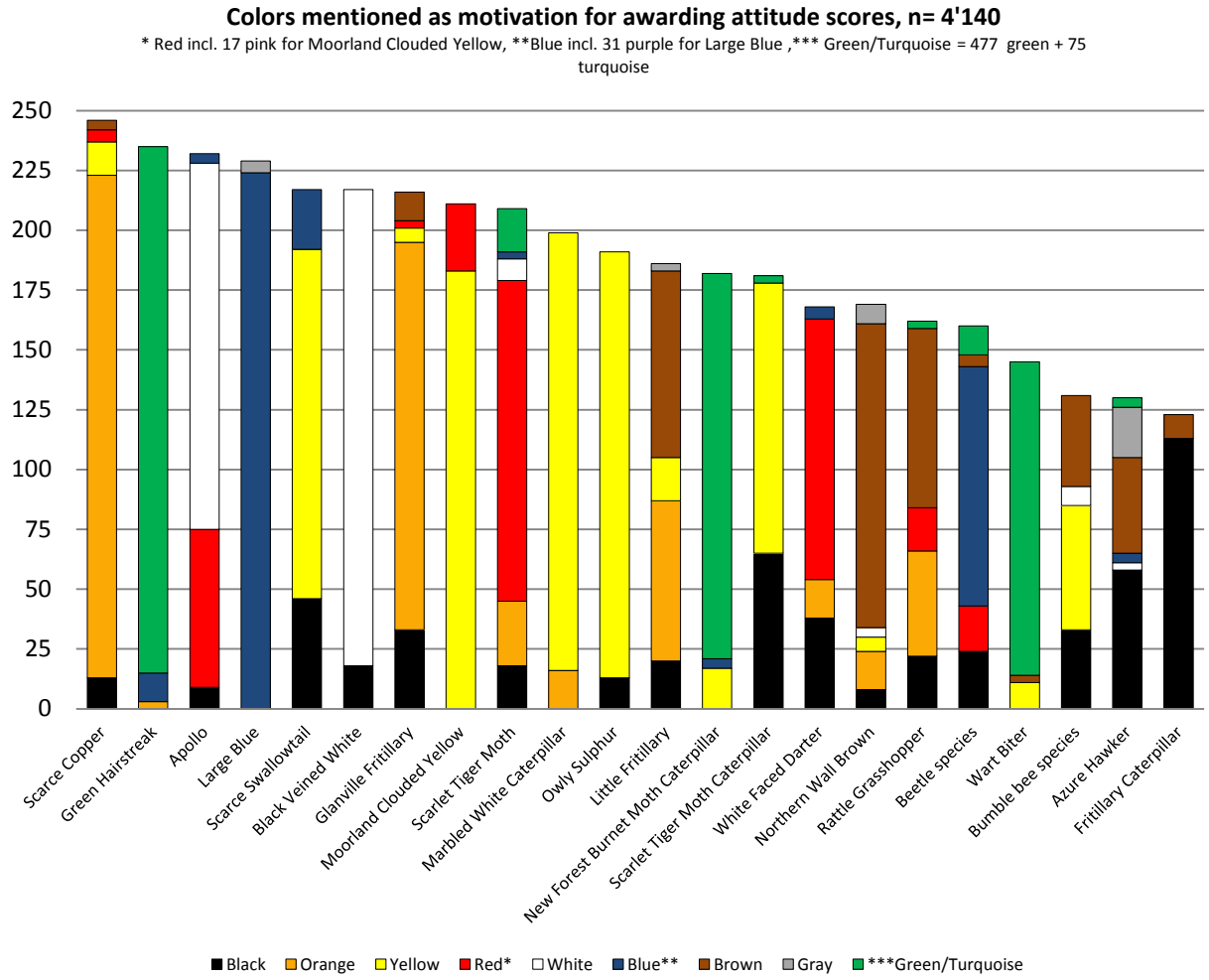

Figure 3: Colors mentioned by the 331 children as relevant for awarding attitude scores to 11 adult butterflies/moths and 11 other insects. Two colors could be named per insect. To simplify the graph, colors with counts < 3 per species are not shown (80 counts altogether).

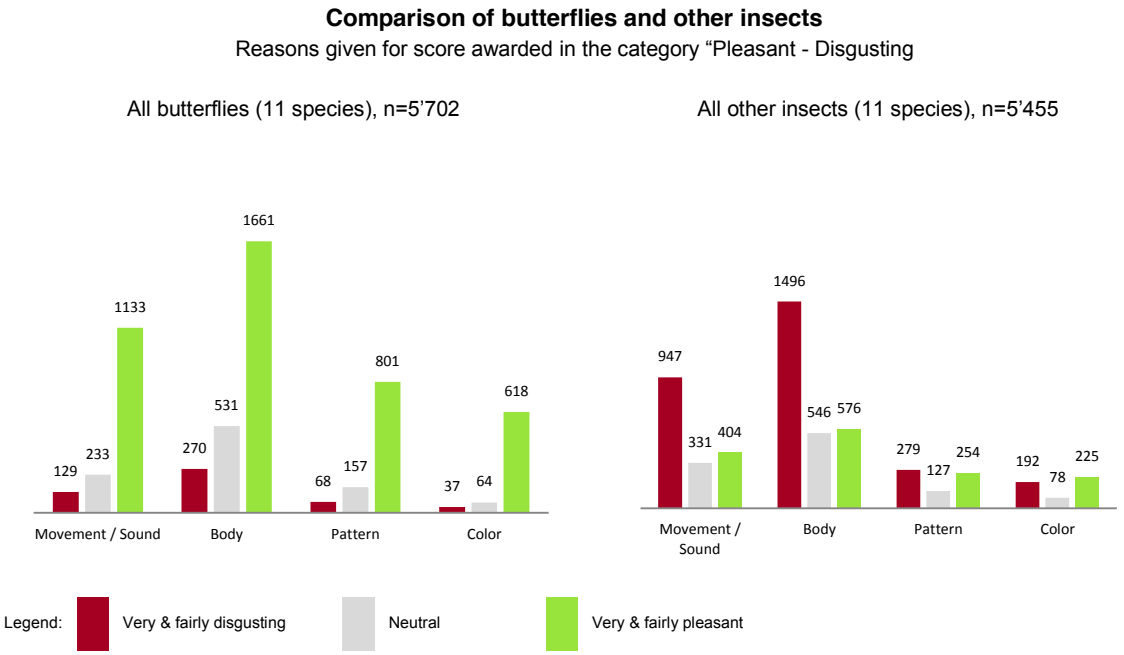

Figure 4: Descriptive frequency distribution of the 4 reasons (movement / sound, body features, pattern and color) given by the 331 children for awarding attitude scores in the category "Pleasant – Disgusting" for the 11 butterfly (adult butterfly /

moth) and 11 other insect species. Ticking multiple reasons per category was permitted. To simplify the visualization, the respective counts for "very" and "fairly" are combined.

Table 2: Wilcoxon rank test applied to (a) the 2 black caterpillar species, (b) the 2 dragonfly species, and (c) the 2 grasshopper species, based on 331 questionnaires.

a) Attitude category	Mean value		p-value
	Fritillary Caterpillar *(Boloria sp.)*	**S.Tiger Moth Caterpillar** *(Callimorpha dominula)*	
"Pretty – Ugly"	2.31 (n=325)	3.41 (n=325)	p < 0.001
"Interesting – Boring"	2.64 (n=324)	3.01 (n=322)	p = 0.001
""Pleasant – Disgusting"	2.39 (n=323)	2.91 (n=323)	p < 0.001
"Confidence-inspiring – Fearsome"	3.09 (n=323)	3.48 (n=320)	p = 0.000

b) Attitude category	Mean value		p-value
	Azure Hawker *(Aeshna caerulea)*	**White Faced Darter** *(Leucorrhinia dubia)*	
"Pretty – Ugly"	2.29 (n=329)	2.96 (n=325)	p < 0.001
"Interesting – Boring"	2.88 (n=326)	2.96 (n=325)	**p = 0.376**
""Pleasant – Disgusting"	2.22 (n=327)	2.54 (n=324)	p = 0.000
"Confidence-inspiring – Fearsome"	2.85 (n=328)	3.17 (n=325)	p = 0.002

c) Attitude category	Mean value		p-value
	Rattle Grasshopper *(Psophus stridulus)*	**Wart Biter** *(Decticus verrucivorus)*	
"Pretty – Ugly"	2.26 (n=327)	2.48 (n=326)	p = 0.007
"Interesting – Boring"	2.75 (n=326)	2.89 (n=324)	**p = 0.184**
""Pleasant – Disgusting"	2.31 (n=323)	2.44 (n=324)	**p = 0.162**
"Confidence-inspiring – Fearsome"	2.94 (n=325)	3.24 (n=321)	p = 0.004

Table 3: Significance of gender differences in the respective attitude categories tested for (a) the 11 butterfly species and (b) for 11 other insects with the Wilcoxon Rank test, based on 167 questionnaires filled out by girls and 164 by boys.

Attitude category	Mean value		p-value
	Girls (n=167)	**Boys (n=164)**	
a) Butterflies			
"Pretty – Ugly"	4.40	4.25	p < 0.001
"Interesting – Boring"	3.84	3.41	p < 0.001

“”Pleasant – Disgusting”	4.12	3.90	$p < 0.001$
“Confidence-inspiring – Fearsome”	4.22	4.21	**$p = 0.747$**
b) Other insects			
“Pretty – Ugly”:	2.68	2.99	$p < 0.001$
“Interesting – Boring”:	2.90	2.98	**$p = 0.079$**
“”Pleasant – Disgusting”:	2.30	2.73	$p < 0.001$
“Confidence-inspiring – Fearsome”:	2.85	3..42	$p < 0.001$

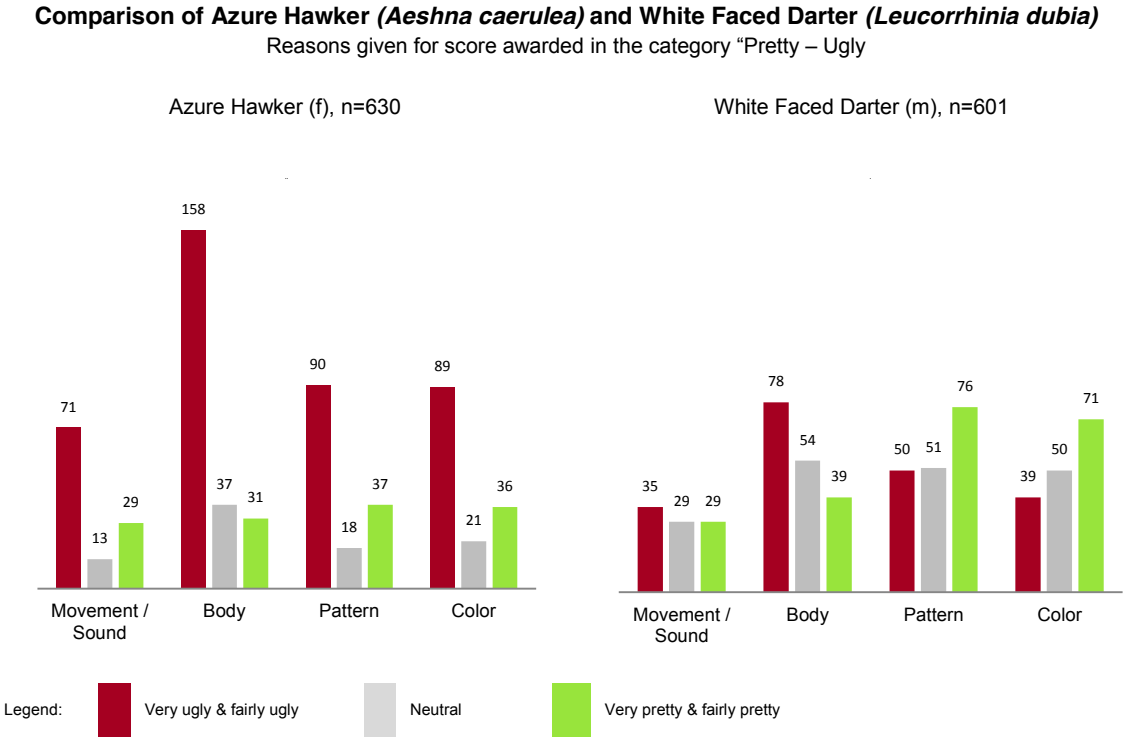

Figure 5: Descriptive frequency distribution of the 4 reasons (movement / sound, body features, pattern and color) given by the 331 children for awarding attitude scores in the category "Pretty - Ugly" towards the Azure Hawker *(Aeshna caerulea)* and White Faced Darter *(Leucorrhinia dubia).* Ticking multiple reasons per category was permitted. To simplify the visualization, the respective counts for "very" and "fairly" are combined.