**Investigating children’s attitudes and learning about soil invertebrates**

***Introduction***

Soil invertebrates play a central role in terrestrial ecosystem functioning but public awareness about the importance of soil invertebrates is low and they are neglected in conservation research and policy. This study investigated children’s perceptions of soil invertebrates and the impact of an educational intervention on these. Our focal audience was children aged 7-9 years because this is considered an important period for disgust development and attitude formation. The intervention was designed to promote close, in-depth observation of invertebrates through a series of questions about the appearance, movement and behaviour of the animals under observation and drawing.

We used a pre-post-evaluation of the intervention and a mixed methods approach based on questionnaires with open-choice and closed-choice questions, interviews, and learner-generated drawings to investigate the variables of interest. The methodology draws on theories of fear and disgust (Matchett & Davey, 1991; Rozin & Fallon, 1987) and psychological distance theory (Trope & Liberman, 2010), which proposes that we have different cognitive and affective perceptions of phenomena we experience infrequently compared to those that we regularly interact with in daily life.

We invited schools to participate via an email bulletin about the project circulated to primary schools in the target areas. A total of 220 children aged 7 – 9 years at four primary schools took part, from April – June 2023. Children completed a questionnaire before and immediately afterwards the session.

***Questionnaire***

The questionnaire comprised the following sections:

1. A list of statements in random order based on three subscales (fear, disgust and psychological distance). Statements are rated using a 5-part Likert scale.
2. A series of photographs with two semantic differential scales, where participants are asked to position themselves between two polar opposites (in this case, ‘disgusted’ to ‘pleased’ and ‘scared’ to ‘relaxed’
3. The ‘post participation’ questionnaire also contained one ‘closed choice’ and one ‘open choice’ feedback questions.

The questionnaire was refined during a pilot phase with 22 children. The order of presentation of the photographs and statements were randomised in the investigation to produce 2 separate versions of each questionnaire, to control for an effect relating to order of presentation (e.g. response fatigue). Children completed printed paper questionnaires immediately before and after the intervention, with no conferring.

***Interviews***

Semi-structured interviews were conducted in three schools, 2-3 weeks after the intervention to obtain additional data about children’s perceptions and experiences of ground invertebrates. Interviews were conducted by the lead author, with children in groups of two or three, selected by the teacher. Eaqch interview was approximately 15 minutes in length. Interviews were recorded and transcribed using a transcription service.

***Assessment and analysis: drawings***

The drawing assessment and analysis was based on the methodological approaches developed by Wilson and Bradbury (2016) and Stagg and Verde (2018). A list of diagnostic morphological characters was produced for each taxonomic order, using invertebrate classification guides. Each drawing was visually assessed to score the number of characters discernible in the drawing, with each character being scored ‘0’ if absent and ‘1’ if present. The data was validated using two independent assessors and a Cronbach’s Alpha coefficient.

**References**

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