Fundamental questions in meiofauna research highlight how small but ubiquitous animals can help to better understand Nature

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Supplementary methods and results

Data visualisation

We visually displayed the distribution of voters in terms of their expertise and career stage using bar plots generated with the function “geom_bar” of the package “ggplot2” v3.4.1 (Wickham, 2016) in R v4.1.2 (R Core Team, 2023). To illustrate the proportion of voters reached through different communication channels, we used the function “geom_rect”. Additionally, we plotted the number of voters per region using the function “geom_sf” on the shapefile TDWG.level1, provided by the Biodiversity Information Standards (www.tdwg.org/). The impact of the voters’ demographics, their declared expertise on meiofauna, and scientific background on the voting results was graphically represented using redundancy analyses (RDA) with the function “rda” included in the package “vegan” v2.6-2 (Oksanen *et al.,* 2022).

Caveats of interpretation and countermeasures

The background knowledge and preferences of the panel members and the voters might introduce subjectivity both in the formulation of the questions and throughout the voting process. This implies that lower scores do not necessarily reflect the importance or timeliness of a given question, but rather that experts in those topics may have been underrepresented amongst the voters. Indeed, meiofauna research has traditionally been dominated by ecologists and a large percentage of the researchers within the overall community are interested in the use of meiofauna for monitoring and as indicators of anthropogenic impacts. This imbalanced expertise may also explain the differences in how the votes were parsed across the panels. To control for these biases, we asked voters to indicate their scientific background in the survey form, so that we could incorporate this as a confounding factor in the analyses.

Given the multidisciplinary character of meiofauna research, we were particularly mindful of maximising the readability during the formulation of the questions (see above). Despite our efforts, some questions might have remained less readable than others, largely because of their intrinsic complexity. We therefore included the Flesch readability of the questions (Flesch, 1948), and the number of words as confounding factors in the analyses of the survey results. Finally, we implemented an additional countermeasure to further reduce bias, in addition to targeting a broad audience and using a diverse panel composition, by allowing voters to suggest additional questions when voting in the survey. We thereby empowered voters to expand the range of priority topics.

Impact of voters’ demographics and scientific backgrounds on the voting patterns.

We evaluated the impact of voters’ traits in the response matrix using permanova. We used a Jaccard distance matrix calculated from the response of the surveys as a response variable, and demographic (*i.e.*, year of birth, gender, continent, and meiofauna background) and the background (*i.e.*, declared expertise in research areas of Evolution, Ecology, Systematics, Morphology, Geochemistry, Microbiology, Molecular, Conservation, and Education) traits of the voters as predictors. Career stage was omitted as it provides the same information as the year of birth. Jaccard matrix was calculated using the function "vegdist" and the permanova was calculated with the function "adonis" by setting 999 permutations, both implemented in the R package "vegan" v2.6-2 (Oksanen et al. 2022).

The demographic predictors "year of birth" ($R^2 = 0.01$; $p = 0.008$), "gender" ($R^2 = 0.01$; $p = 0.001$), "continent" ($R^2 = 0.03$, $p = 0.029$) and expertise ($R^2 = 0.01$; $p = 0.003$), and the expertise predictors "evolution" ($R^2 = 0.02$; $p = 0.001$), "systematics" ($R^2 = 0.02$; $p = 0.001$), and "ecology" ($R^2 = 0.01$; $p = 0.003$) were significant, but the total amount of the variance explained by these predictors was very low ($R^2 = 0.11$) (Table S1).

Impact of question properties on the voting scores

We evaluated the impact of the length and readability of the questions using generalised linear models. The total score for each question was selected as the response variable, whereas the number of words, Flesch readability index, the panel, and the interactions between these variables were selected as predictors. We adjusted our model using a binomial distribution because scores are positive integers and exhibit overdispersion. The model employed was "*scores ~ nwords + Flesch + panel*". Models were adjusted using the function "glm.nb" in the R package "MASS" v7.3-57 (Venables & Ripley, 2002). Overdispersion and the model's performance were evaluated using the functions "check_overdispersion" and "check_model" included in the R package "performance" v0.10.0 (Lüdecke et al. 2021). For the models that included a set of predictors with both categorical and continuous variables, we produced the output tables using Type II ANOVA tables, as produced by the function "Anova" in the R package "car" v3.0.10 (Fox & Weisberg, 2019).

Panel exhibited a significant effect on the question's score (LR $\chi^2 = 151.938$, $p < 0.0001$), but not the number of words (estimate = 0.000, p = 0.811) nor the Flesch readability (estimate = 0.000, p = 0.822). Interestingly, the interaction between readability and panel was also significant (LR $\chi^2 = 22.032$; $p = 0.002$), suggesting that within a given topic, questions with different readability received different scores (Table S2).

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Table S1. Effect of voters' traits on the voting patterns across questions, analysed through permanova. Abbreviations: Df = degrees of freedom, SS = sum of squares; R2, and p-values are reported. P values for significant predictors are marked in bold.

	Df	SS	R^2	F	p-value
Birth	**1**	**0.158**	**0.008**	**2.412**	**0.008**
Gender	**1**	**0.207**	**0.011**	**3.154**	**0.001**
Continent	**6**	**0.647**	**0.034**	**1.640**	**0.029**
Expertise	**1**	**0.177**	**0.009**	**2.688**	**0.003**
Evolution	**1**	**0.342**	**0.018**	**5.205**	**0.001**
Systematics	**1**	**0.353**	**0.019**	**5.367**	**0.001**
Ecology	**1**	**0.192**	**0.010**	**2.929**	**0.003**
Morphology	1	0.094	0.004	1.436	0.096
Geochemistry	1	0.072	0.004	1.104	0.294
Microbiology	1	0.053	0.003	0.801	0.646
Molecular	1	0.105	0.006	1.601	0.055
Conservation	1	0.073	0.004	1.118	0.289
Education	1	0.086	0.004	1.307	0.171
Residual	249	16.357	0.865		
Total	267	18.916	1		

Table S2 Output of the generalised linear model to test the effects of the question length (in number of words), readability, and panel in the scores. The output of a type II ANOVA table is reported for the model to include both categorical and continuous predictors. Abbreviations: LR χ^2 = likelihood ratio chi-square values, Df = degrees of freedom, Std.Error = standard error; P-values and estimates for significant predictors are marked in bold

	LR χ^2	Df	estimate	Std.Error	z value	p-values
intercept	**-**	**-**	**7.5560**	**0.0843**	**89.6650**	**< 0.0001**
words	0.1320	1	-0.0011	0.0044	-0.2580	0.7167
flesch	0.2800	1	-0.0001	0.0023	-0.0580	0.5967
panel	**200.4860**	**7**	**-**	**-**	**-**	**< 0.0001**
words:Flesch	0.0100	1	-	-	-	0.9198
words:panel	10.0270	7	-	-	-	0.1870
Flesch:panel	**22.0320**	**7**	**-**	**-**	**-**	**0.0025**
words:Flesch:panel	6.8430	7	-	-	-	0.4454

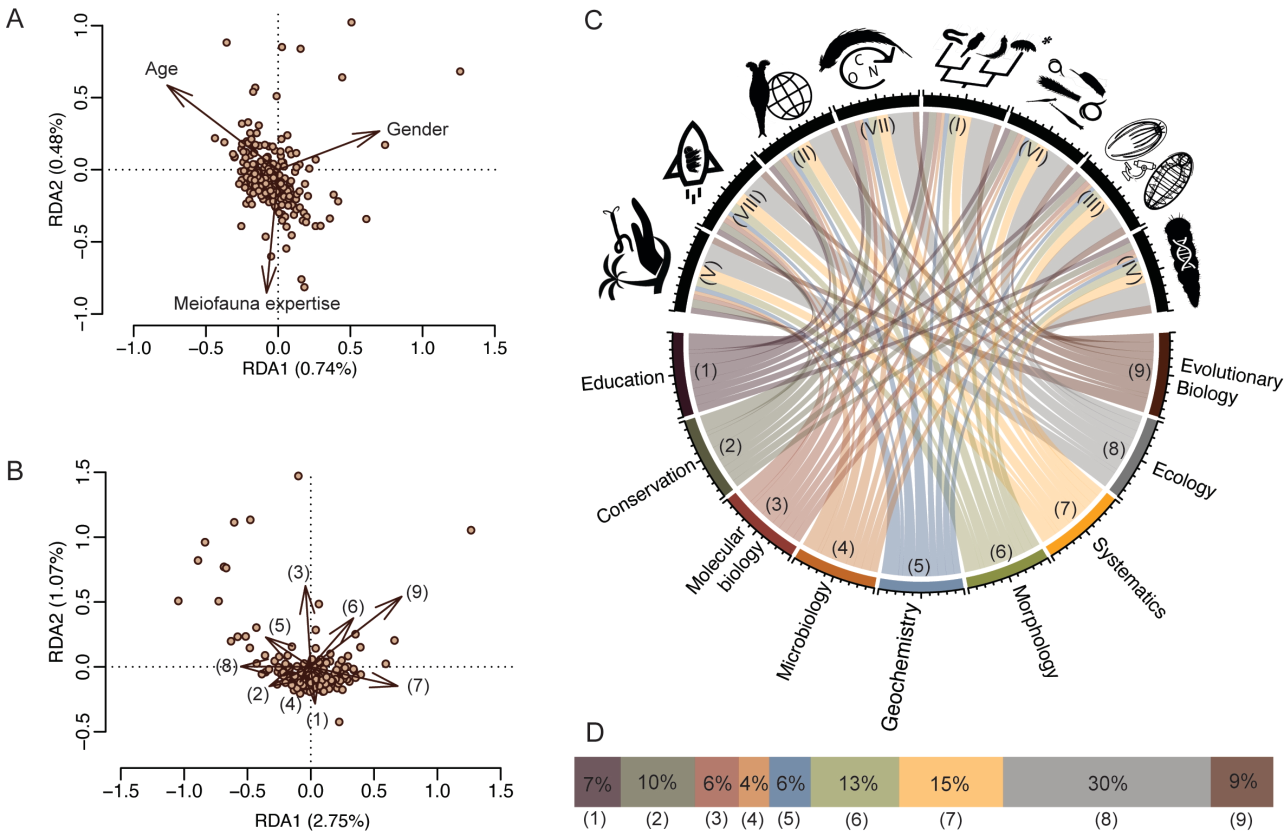

Figure S1. Redundancy analyses, showing the lack of relationships between the voters' demographic parameters and their expertise **(A)**, and between their scientific background **(B)**: numbers between parentheses refer to the numbers of the nine categories in **C** and **D**. **(C)**. Percentage of the votes received by each panel according to the scientific background of the voters, showing again that there is not imbalance between scientific background and scores. **(D)**. Scientific background of the voters. Silhouettes drawn by Alejandro Martínez.