

Exploratory Statistical Analysis

The 40 questions relate directly to the 40 principles of the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers. All questions were answered by 277 employees, 99 Female (36%) and 178 Male (64%; Figure 1).

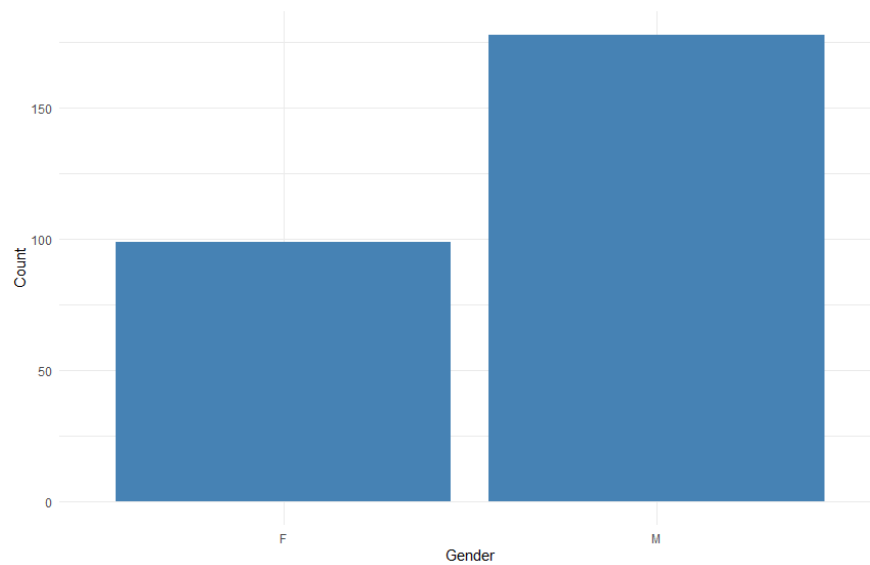


Figure 1: Female versus Male Respondents

19% of the respondents belong to the "20-30" age group, 34% of the respondents belong to the "31-40" age group, 30% of the respondents belong to the "41-50" age group and 17% of the respondents belong to the "51 >" age group (Figure 2).

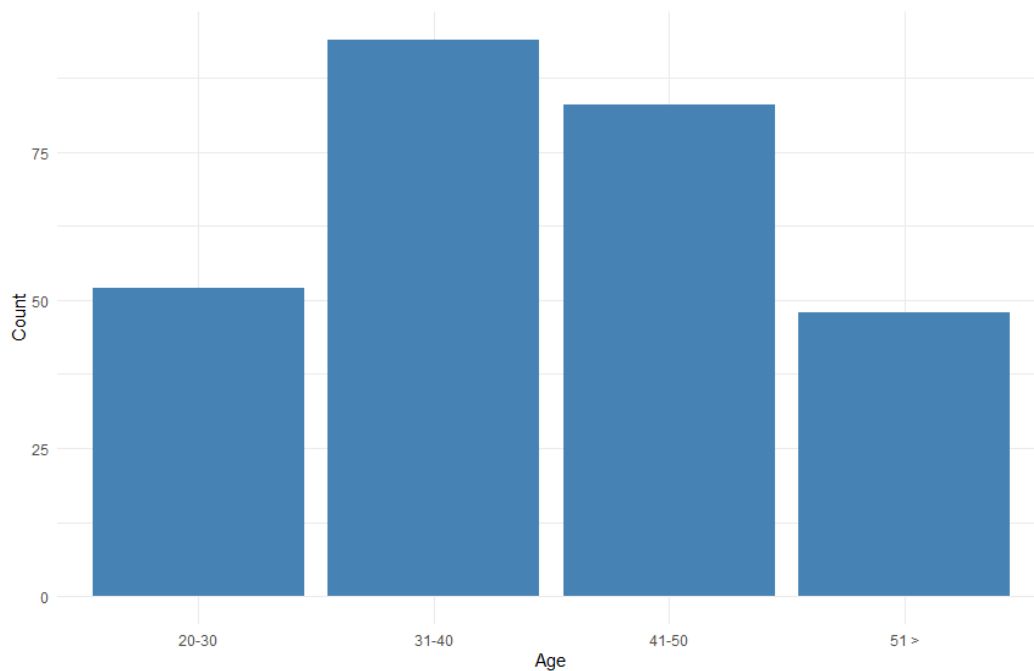


Figure 2: Age distribution

Finally, 19% of the respondents are PhD Candidates, 29% of the respondents are Postdoctoral Researchers and 29% of the respondents are tenured or tenure-track Researchers and University Faculty (Figures 3 and 4).

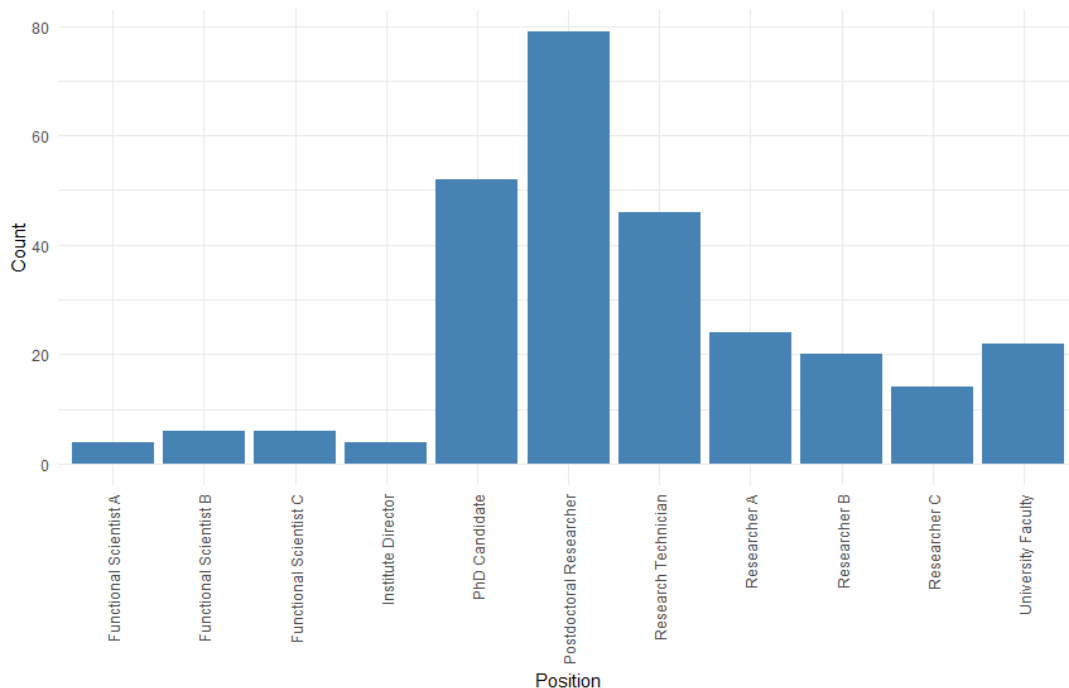


Figure 3: Distribution of respondents according to their position in FORTH

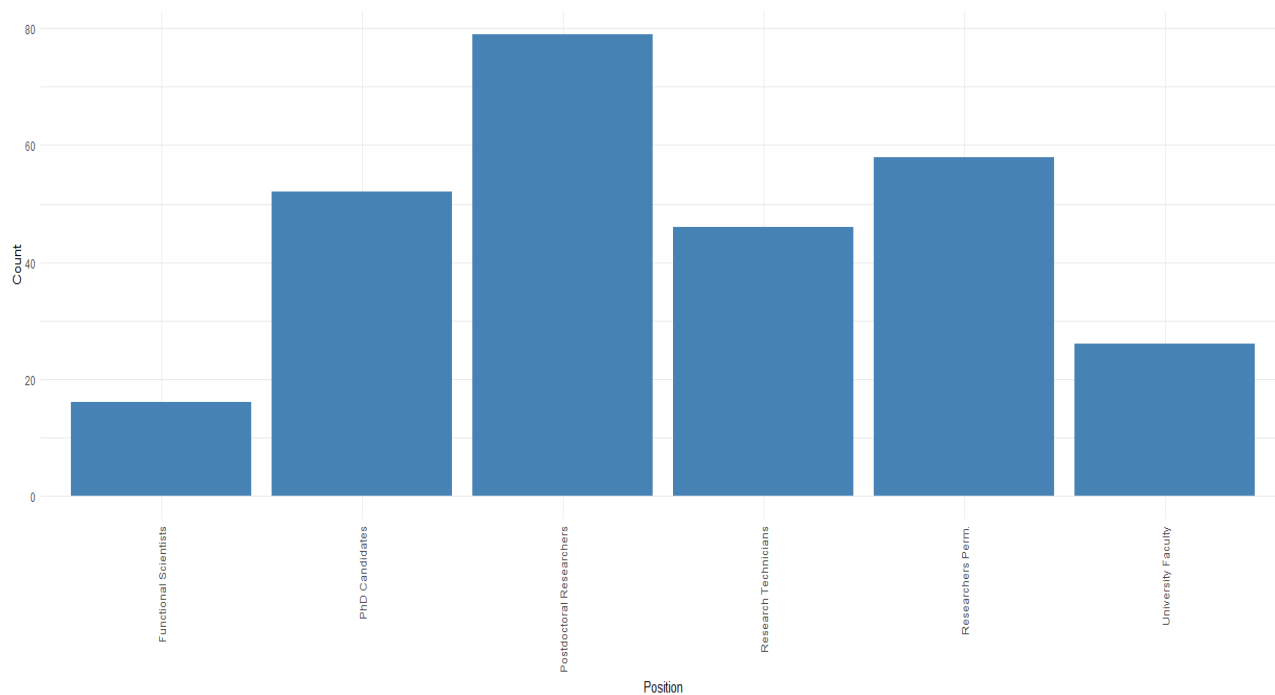


Figure 4: Distribution of respondents according to their position in FORTH

Central tendencies

For each question, analyses focus on the percentage of answers per category (Likert scale with 4 classes): -/- "Insufficiently implemented", -/+ "Partially implemented", +/- "Almost implemented", +/+ "Fully implemented". Descriptive statistics, such as means and standard deviations, have unclear meanings when applied to Likert scale responses. Experts over the years have argued that the median should be used as the measure of central tendency for Likert scale data (Jamieson S. Likert scales: how to (ab)use them. Med Educ. 2004;38(12): 1217-1218.)

By assigning numerical values to the 277 responses per question, specifically 1 if the response is -/-, 2 if -/+, 3 if +/- and 4 if +/+ and taking the median score per question, one observes that the median response equals 4 (hence at least 50% of the respondents believe that the principles are fully implemented) in all questions, except for question 30 (namely Access to career advice: FORTH provides professional counseling) for which the median equals 3 (in this case one is justified to argue that FORTH does not fully implement the 30th principle).

The maximum number of points per question is 1108 (MTS: maximum total score). Figure 5 shown below depicts the total number of points per question divided by MTS (thus rescaled in the [0,1] interval).

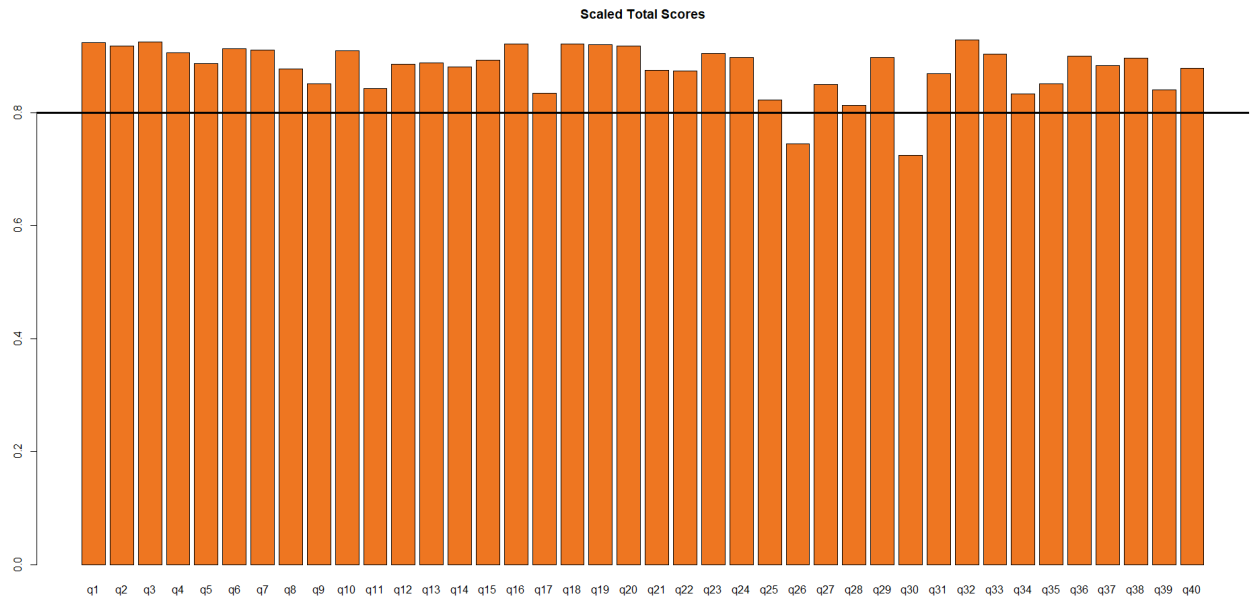


Figure 5: Scaled (in the [0,1] interval) total scores per question.

Distributions of percentages per response category

The distributions shown in the boxplot below, summarize the following information:

The maximum percentage of $++$ in the 40 questions is 78%.
The corresponding minimum is 39% with $Q1 = 59\%$, $Q2=67\%$, $Q3=72\%$

The maximum percentage of $+/-$ in the 40 questions is 31%.
The corresponding minimum is 15.5% with $Q1 = 20\%$, $Q2=24\%$, $Q3=25.5\%$

The maximum percentage of $-/+$ in the 40 questions is 21%.
The corresponding minimum is 2% with $Q1 = 5\%$, $Q2=7\%$, $Q3=9.5\%$

The maximum percentage of $--$ in the 40 questions is 14%.
The corresponding minimum is 0.7% with $Q1 = 1.7\%$, $Q2=2\%$, $Q3=4\%$

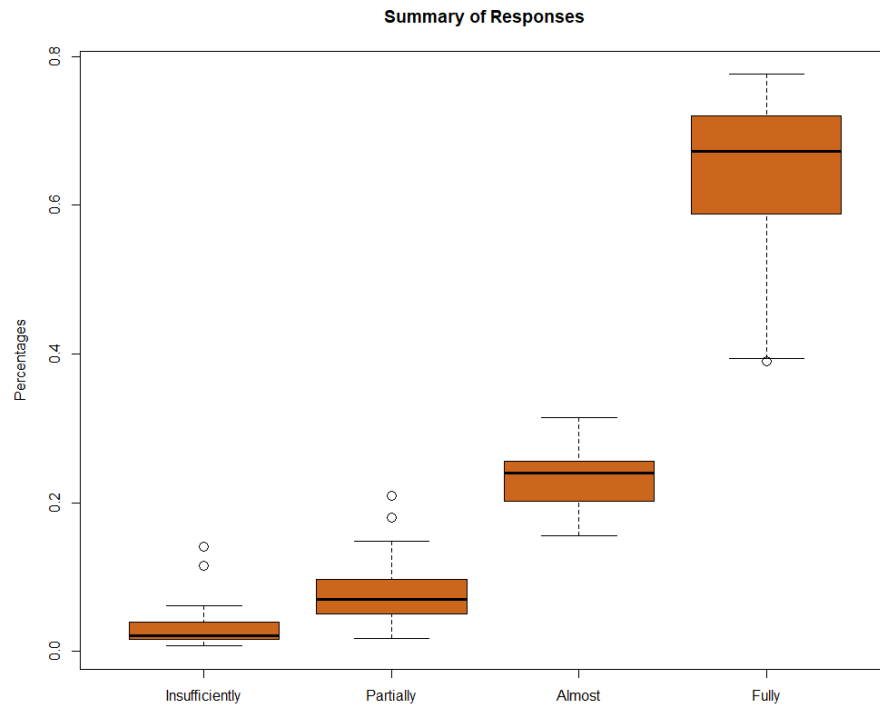


Figure 6: Distribution of percentages by response category

An overall summary of the responses to the 40 questions reveals that 2% of the responses are "Insufficiently Implemented", 7% are "Partially Implemented", 24% are "Almost Implemented" and 67% "Fully Implemented"

Principles with the highest percentages in -/-

Principles of particular interest are the ones that attain the highest percentages in -/-. The ones in the top 25% are the following:

- Question 30 (14%) Access to career advice: FORTH provides professional counseling
- Question 26 (11.6%) Funding and Salaries: Research funding and salaries are satisfactory, there is enough effort to ensure that researchers have fair and attractive salaries and social benefits.
- Question 28 (6%) Career development: FORTH provides opportunities for professional development, there is provision for continuous education.
- Question 11 (5.8%) Evaluation/appraisal systems: The evaluation systems applied in FORTH are sufficient.
- Question 25 (5.4%) Stability and permanence of employment: Employment stability for researchers and especially for fixed-term contractual researchers is ensured.
- Question 22 (5.4%) Recognition of the profession: FORTH recognizes your professional status as a researcher from the first and during all stages of your career.
- Question 34 (5.4%) Complains/ appeals: The appeals and objections raised between a researcher and an employer are assessed properly.
- Question 17 (4.7%) Variations in the chronological order of CVs: Career breaks or time fluctuations in CV are evaluated positively since they may effect positively the formation of the research character.
- Question 27 (4.3%): Gender balance: There are efforts to ensure gender balance at all levels of the organization in recruitment and promotion levels.

Gender inhomogeneity

Do different genders tend to respond differently? The Mann-Whitney statistical test was applied in all 40 questions with a correction for multiple-testing. The observed, extremely low p-values suggest that we have strong evidence in favor of significant differences per gender for

- a) Question 10 Non-discrimination: The non-discrimination practices of FORTH are sufficient.
- b) Question 14 Selection: Staff selection committees are composed of members with different professional qualifications and expertise to ensure gender balance.
- c) Question 25 Stability and permanence of employment: Employment stability for researchers and especially for fixed-term contractual researchers is ensured.

Although the gender-specific median responses are both equal to 4, one observes higher percentages in of +/- and -/+ in females for these questions. To put it otherwise, males tend to believe that the abovementioned principles are fully implemented, whereas a significant fraction of the female employees do not agree. As an example, Figure 7 depicts the distribution of responses by gender for question 10.

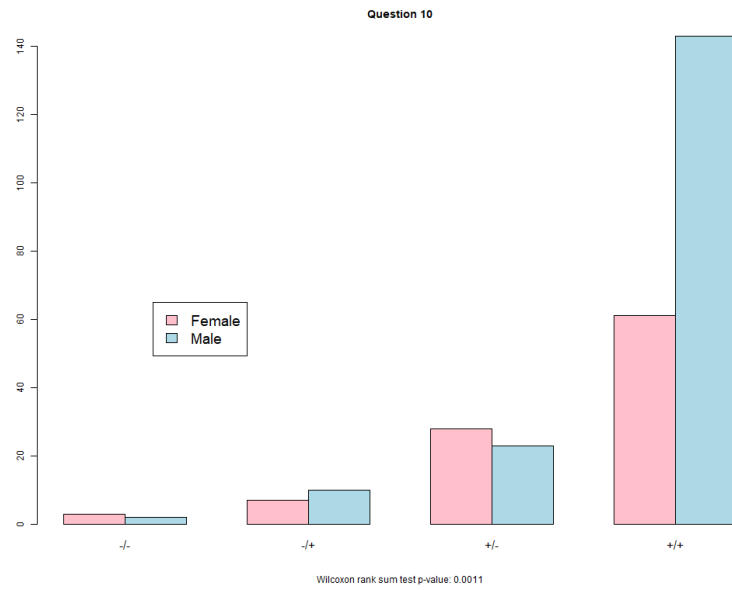


Figure 7: Distribution of responses by gender for Question 10.

Dependence on Age

Do we observe significant differences in the responses per age group? The Kruskal-Wallis test was applied in all 40 questions; in this case we do not observe p-values extreme enough to suggest strong evidence in favor of age-dependent responses. As an example, Figure 8 depicts the distribution of responses by age for question 21.

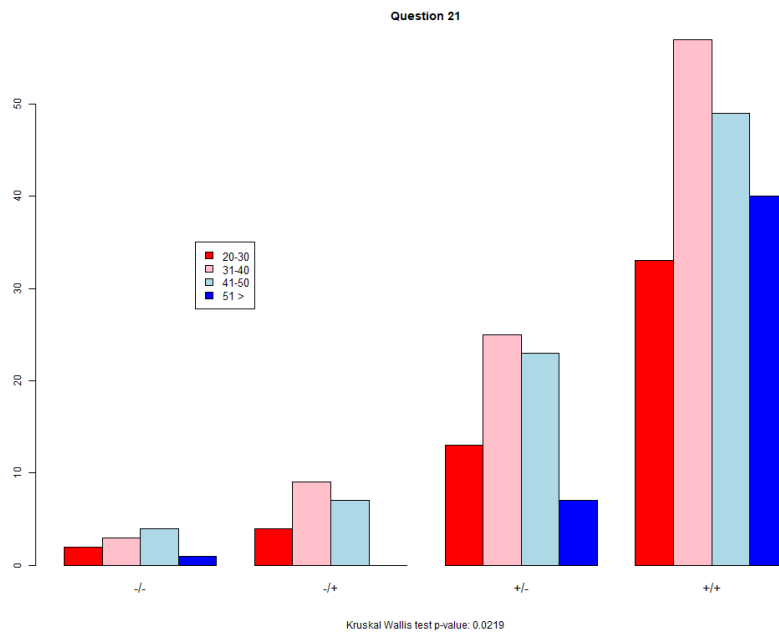


Figure 8: Distribution of responses by age for Question 21.

Dependence on professional position

Do we observe significant differences in the responses per professional position? The Kruskal-Wallis test was applied again in all 40 questions; again, in this case we did not observe p-values extreme enough to suggest strong evidence in favor of position-dependent responses. As an example, Figure 9 depicts the distribution of responses by age for question 21.

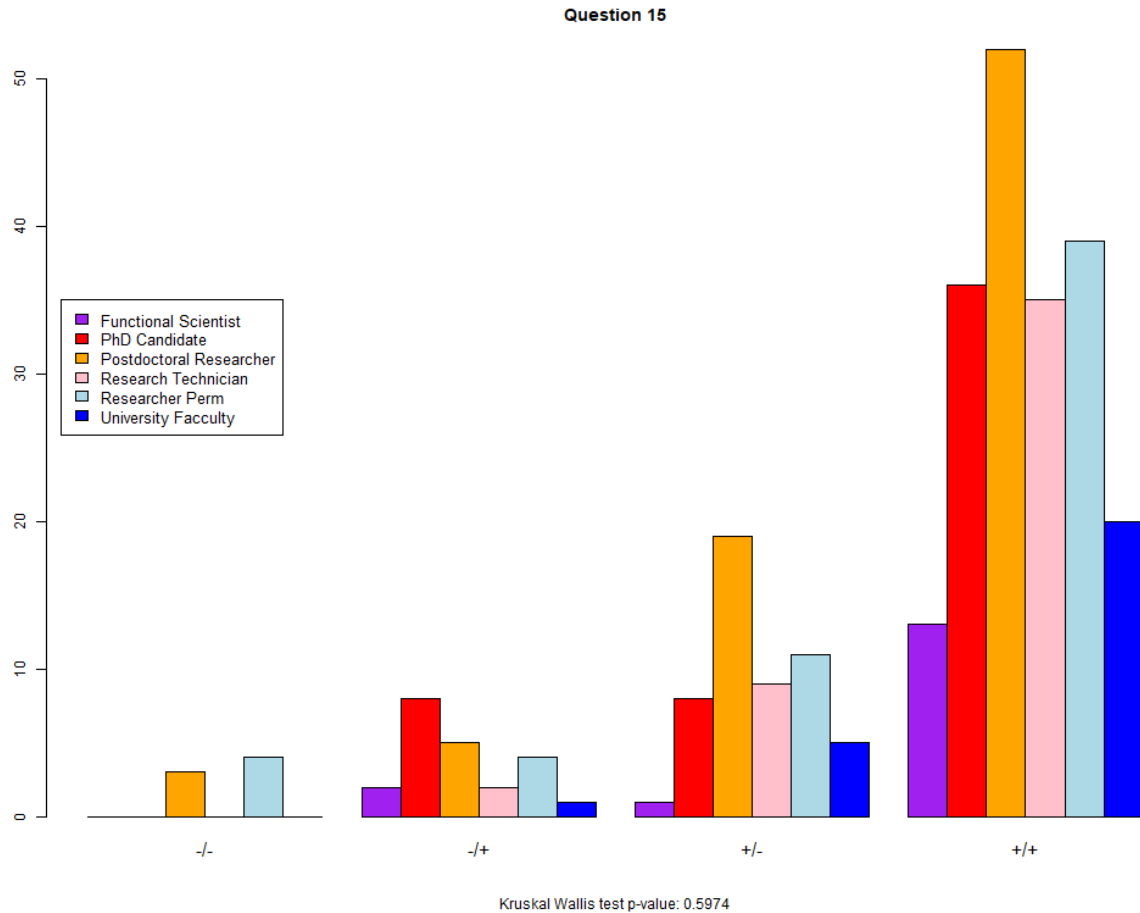


Figure 9: Distribution of responses by professional position for Question 15.