2014 Staff Survey

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January 15th, 2015

2014 Staff Survey

In keeping with our normal practice, we present the detailed analysis of this years Alphacrucis Staff Survey.

This document complements the high level overview presentation provided to all staff at the annual staff retreat. It is intended to go into further detail on each question, expand upon methodologies used and document the assumptions we have made. As in previous years - and in the spirit of open information, transparency and reproducible research - the quantitative dataset has been made available for further analysis. We encourage individuals to perform their own analysis, particularly if their assumptions differ from ours, and present their findings to us all. To make this even easier, this PDF has been generated from a document written in *R Markdown* format, allowing the researcher to run all our computations on their own computer, and adjust them as they see fit.

This copy of the dataset, along with the original version, are completely anonymous. The only difference between the two is that we don't include the qualitiative data in this copy, as we feel it has the potential to be *more* identifiable.

Objectives of this analysis

In presenting the annual staff survey, our objective is to convey the core themes of the data collected from staff, to staff, in a manner accessible to all staff. Note that this is not a statement about data accuracy, which it goes without saying should remain as high as possible at all times, but one of the scope of our analysis. There are many areas our analysis could have taken us, but we only persue those within the scope of our brief. This is not to say that analysis outside this scope is not interesting to us - we feel it provides a rich area of exploration and towards the end of this document have listed areas we would like to see our colleagues lend their skills to examining.

This is primarily a *qualitative* study. Although we collect quantitative data, its primary use is to categorise the qualitative feedback received. Secondary to this is it's use as a broad, high level overview of the survey to provide a context for the textual analysis to exist in.

Methodology: Data collection

Methodology: quantative data

Any analysis of quantative data first needs to consider nature of the data itself in order to draw statistically valid conclusionsfrom it. Stanley Smith Stevens'[1] *Theory of Scales of Measurment* proposes a heirarchy of four levels:

1. *Nominal data.* Unordered categorical data. (Example: Female, Male)
2. *Ordinal data.* Ordered data, but with no measure of distance (Example: ranking fruit by colour - Very Orange, Pale Orange)
3. *Interval data.* Ordered data where distance measurment is possible, but where there is no true zero point (Example: temperature measured in Celcius. It doesn't make sense to say 20C is twice as hot as 10C)
4. *Ratio data.* Ordered data with a true zero point, where both distance, and fractions of distance between variables are possible. (Example: absolute tempreture measured in Kelvin.)

[1] S. S. Stevens, *Science.* 7 June 1946: **103** (2684), 677-680.

Of these categories, the data collected via our Likert questions is of the type *ordinal*. Most important for this discussion is that **descriptive statistics such as the *mean* and *standard deviation*, or any parametric analysis based on the normal distribution, are invalid parameters for ordinal data.** The results obtained by these measures on ordinal data are statistically meaningless.

We know that Strongly Agree is more positive than Agree, but we don't know by how much. Additionally, we don't know that the distance between Strongly Agree and Agree is the same as the distance between Neutral and Disagree.

Despite this being relatively uncontroversial in methodological[2] or statistical[3] texts, it is somewhat surprising how frequently even published researchers break these rules[4]. Allen and Seaman propose that "An underlying reason for analyzing ordinal data as interval data might be the contention that parametric statistical tests (based on the central limit theorem) are more powerful than nonparametric alternatives. Also, conclusions and interpretations of parametric tests might be considered easier to interpret and provide more information than nonparametric alternatives. However, treating ordinal data as interval (or even ratio) data without examining the values of the dataset and the objectives of the analysis can both mislead and misrepresent the findings of a survey."[5]

[2] Blaikie N. *Analysing Quantitative Data.* London: Sage Publications 2003.

[3] Clegg F. *Simple Statistics.* Cambridge: Cambridge University Press 1998.

[4] Jamieson, Susan. "Likert scales: how to (ab) use them." *Medical education* 38.12 (2004): 1217-1218.

[5] Allen, I. Elaine, and Christopher A. Seaman. "Likert scales and data analyses." *Quality Progress* 40.7 (2007): 64-65.

It is our opinion then, that for the data collected via our Likert responses appropriate non-parametric statistical measures for centrality include the mode and median, and for the spread of the distrubutions, the interquartile ranges. Other valid measures may include the use of Kruskall-Models for measures of variance, Chi-Squared and Fisher Exact tests for measures for significance, and simple distribu-

tion free methods such as tabulations and frequency counts.

Given the earlier statement that ours is primarily a qualitative analysis, we will adopt a conservative approach and restrict our quantitative attention to tabulations and frequency counts. Where we group responses into Academic and Administrative categories, it is to contextualise discussion about the textual responses, and we do not offer an opinion on whether one os more- or less-positive than the other.

In light of discussions at Staff Retreat we will, however, propose that Fisher's exact test (with the extension to matricies greater than 2x2 offered by Freeman-Halton) provide a statistically rigourous starting point for any analysis into the differences between these two groups. This will be discussed more in the *Areas for further study* section, and we will provide P-values for tests of non-random associations between Academic and Administrative responses in the Appendix as a motivating example.

Methodology: Visualisations

The primary method for sumarising our Likert data will be via frequency tables. This will be visualised via *Diverging Stacked Bar Charts*. Robbins and Heiberger[6] provide an excellent discussion on the benefits of this approach in *Design of Diverging Stacked Bar Charts for Likert Scales and Other Applications*.

Methodology: Thematic analysis

[TODO: LA]

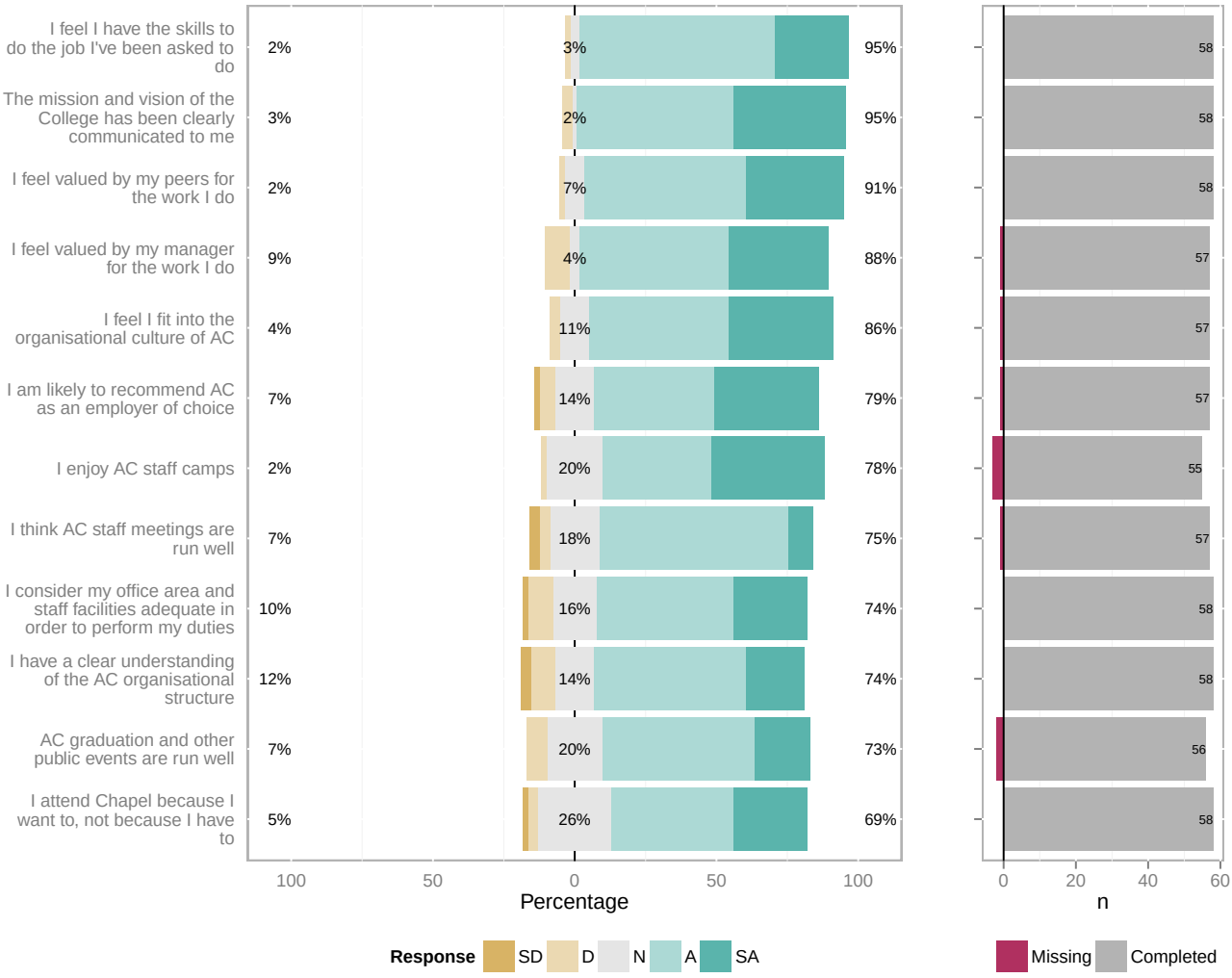
Assumptions

[6] Heiberger, Richard M., and Naomi B. Robbins. "Design of Diverging Stacked Bar Charts for Likert Scales and Other Applications." *Journal of Statistical Software* submitted (2013): 1-36.

Results

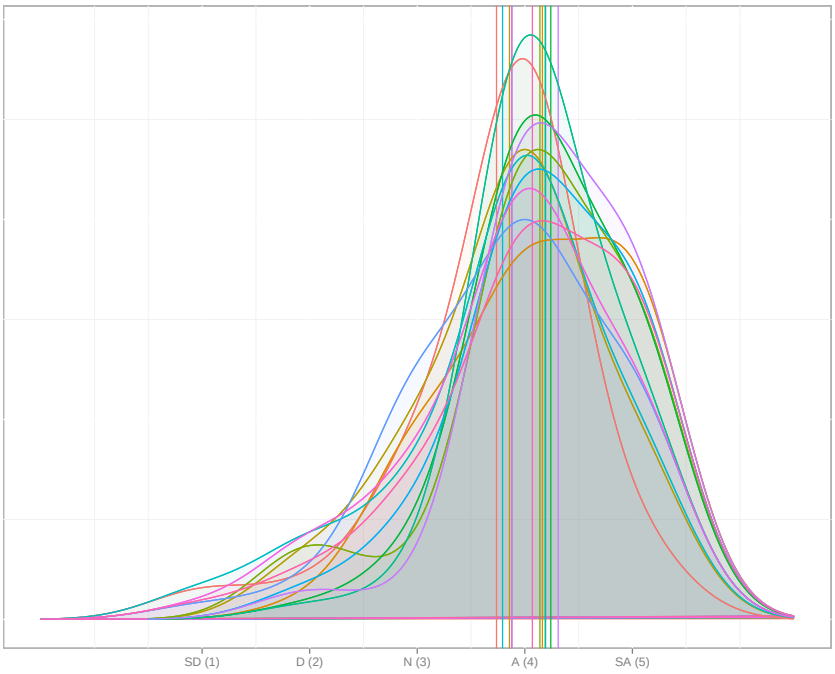
With the caveats mentioned above in mind, we present a brief high level overview of the data to provide a context for the qualitative analysis in the next section.

```
all_staff <- lkt[, 2] == "All staff"
plot(likert(lkt[all_staff, 3:14]), include.histogram = TRUE,
    wrap = 30)
```



As can be seen in the right hand column, the response rates for each question remain ≥ 55 as indicated in grey, with the number of people not providing an answer indicated in red.

```
all_staff <- lkt[, 2] == "All staff"
plot(likert(lkt[all_staff, 3:14]), type = "density",
    facet = FALSE) + theme(legend.position = "none")
```



Here we have overlayed the responses for each question via density plots, to get a broad sense of the uniformity (or otherwise) in responses across the questionaire.

I think AC staff meetings are run well

For this first question we will "show our working" by displaying the underlying R commands used to create the summary table and plot. The commands only differ slightly between questions, so in the interests of brevity we will only present the results for the remaining questions.

Frequency table of responses to the first question, grouped by staff type:

```
q3_summary <- table(lkt[, 2], lkt[, 3])  # Create frequency counts for q3 grouped by staff type
q3_summary <- addmargins(q3_summary, margin = 2)  # Add in row totals
xtable(q3_summary, digits = 0, caption = "Frequency count: \"I think staff meetings are run well\"")
```

	SD	D	N	A	SA	Sum
All staff	2	2	10	38	5	57
Academia	1	1	4	17	3	26
Administration	1	1	6	21	2	31

Table 1: Frequency count: "I think staff meetings are run well"

And the corresponding visualisation of the proportional frequency count, by staff type:

```
q3_lkt <- likert(lkt[3], grouping = lkt[, 2])  # Group q3 responses by staff type
plot(q3_lkt, text.size = 3, include.histogram = TRUE,
    group.order = c("All staff", "Academia", "Administration"))
```

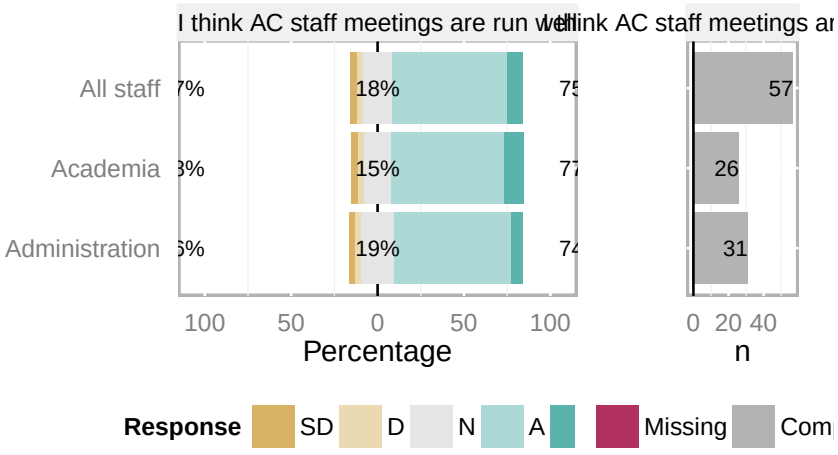


Figure 1: I think AC staff meetings are run well

Who	What	Why
Academia	Agree	Well spaced out, good amount of info communicated, chance for connecting & reflecting
	Disagree	Boring, lack of opportunities to ask questions of leadership, repetitive info
Administration	Agree	Informative, fun, good to align goals, good to hear departmental updates
	Disagree	One-way communication, staff input is not solicited

I enjoy AC staff camps

Frequency table of responses to the first question, grouped by staff type:

	SD	D	N	A	SA	Sum
All staff	0	1	11	21	22	55
Academia	0	0	3	11	12	26
Administration	0	1	8	10	10	29

Table 3: Frequency count: I enjoy AC staff camps

And the corresponding visualisation of the proportional frequency count, by staff type:

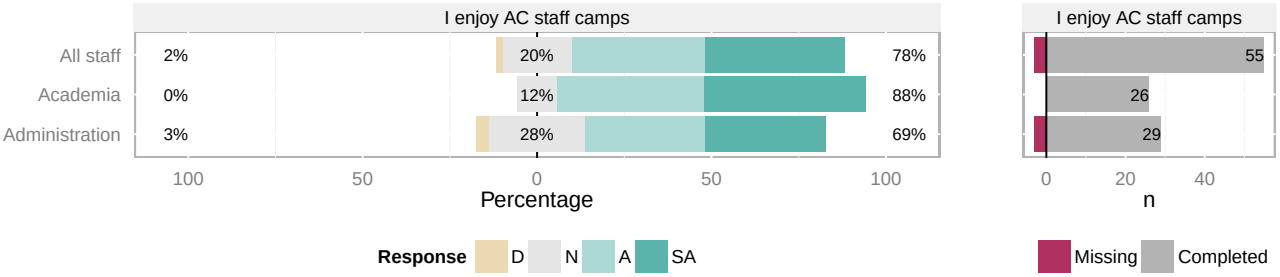


Figure 2: FIX ME

Who	What	Why
Academia	Agree	
	Disagree	
Administration	Agree	
	Disagree	

AC graduation and other public events are run well

	SD	D	N	A	SA	Sum
All staff	0	4	11	30	11	56
Academia	0	1	4	14	6	25
Administration	0	3	7	16	5	31

Table 5: Frequency count: AC graduation and other public events are run well

And the corresponding visualisation of the proportional frequency count, by staff type:

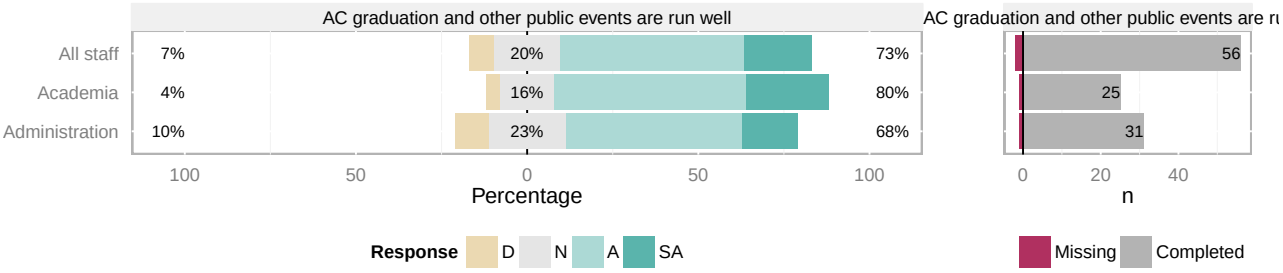


Figure 3: FIX ME

Who	What	Why
Academia	Agree	
	Disagree	
Administration	Agree	
	Disagree	

I feel valued by my manager for the work I do

	SD	D	N	A	SA	Sum
All staff	0	5	2	30	20	57
Academia	0	2	2	15	7	26
Administration	0	3	0	15	13	31

Table 7: Frequency count: I feel valued by my manager for the work I do

And the corresponding visualisation of the proportional frequency count, by staff type:

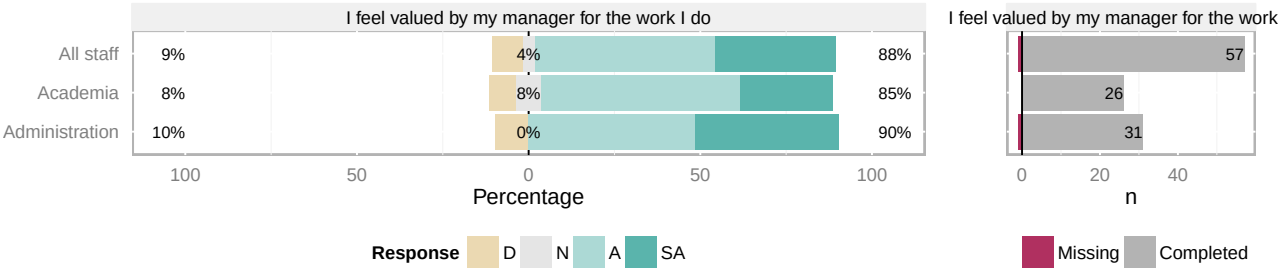


Figure 4: FIX ME

Who	What	Why
Academia	Agree	
	Disagree	
Administration	Agree	
	Disagree	

I feel valued by my peers for the work I do

	SD	D	N	A	SA	Sum
All staff	0	1	4	33	20	58
Academia	0	0	2	16	8	26
Administration	0	1	2	17	12	32

Table 9: Frequency count: I feel valued by my peers for the work I do

And the corresponding visualisation of the proportional frequency count, by staff type:

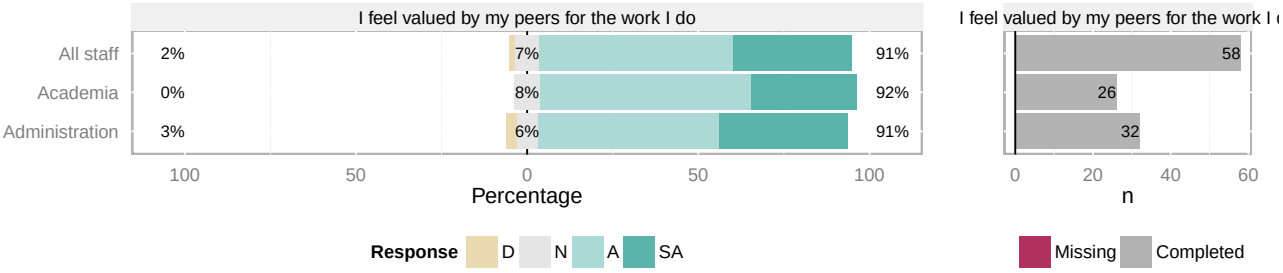


Figure 5: FIX ME

Who	What	Why
Academia	Agree	
	Disagree	
Administration	Agree	
	Disagree	

I feel I have the skills to do the job I've been asked to do

	SD	D	N	A	SA	Sum
All staff	0	1	2	40	15	58
Academia	0	0	2	18	6	26
Administration	0	1	0	22	9	32

Table 11: Frequency count: I feel I have the skills to do the job I've been asked to do

And the corresponding visualisation of the proportional frequency count, by staff type:

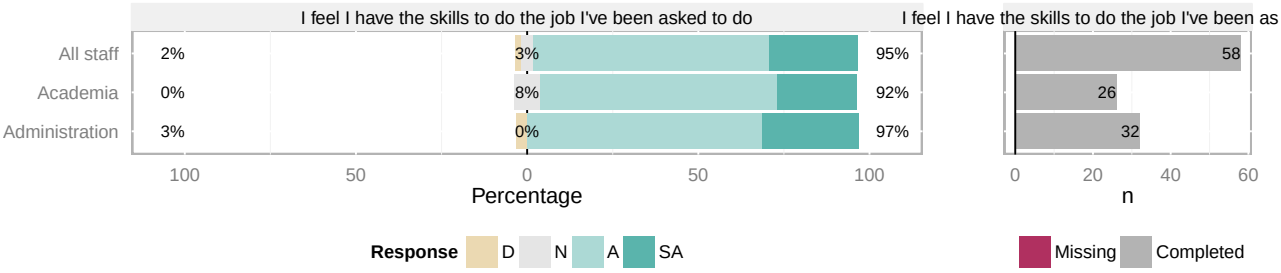


Figure 6: FIX ME

Who	What	Why
Academia	Agree	
	Disagree	
Administration	Agree	
	Disagree	

I have a clear understanding of the AC organisational structure

	SD	D	N	A	SA	Sum
All staff	2	5	8	31	12	58
Academia	1	2	1	17	5	26
Administration	1	3	7	14	7	32

Table 13: Frequency count: I have a clear understanding of the AC organisational structure

And the corresponding visualisation of the proportional frequency count, by staff type:

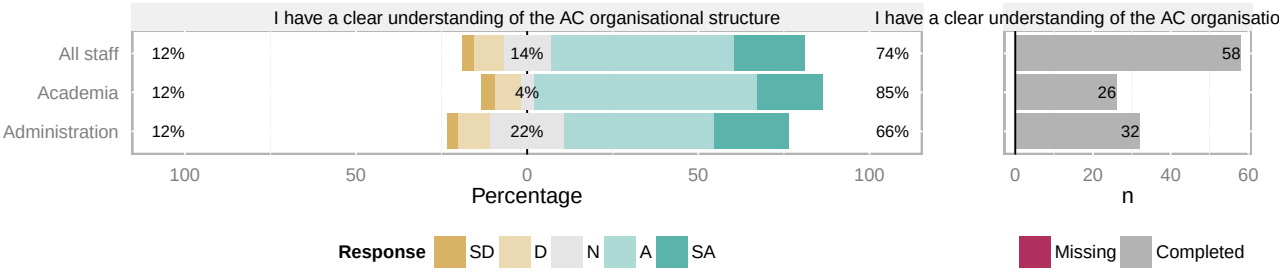


Figure 7: FIX ME

Who	What	Why
Academia	Agree	
	Disagree	
Administration	Agree	
	Disagree	

I feel I fit into the organisational culture of AC

	SD	D	N	A	SA	Sum
All staff	0	2	6	28	21	57
Academia	0	0	2	17	7	26
Administration	0	2	4	11	14	31

Table 15: Frequency count: I feel I fit into the organisational culture of AC

And the corresponding visualisation of the proportional frequency count, by staff type:

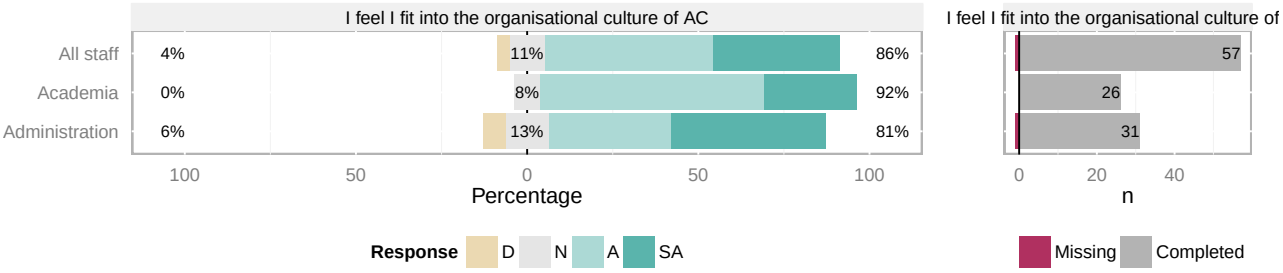


Figure 8: FIX ME

Who	What	Why
Academia	Agree	
	Disagree	
Administration	Agree	
	Disagree	

I attend Chapel because I want to, not because I have to

	SD	D	N	A	SA	Sum
All staff	1	2	15	25	15	58
Academia	1	1	8	14	2	26
Administration	0	1	7	11	13	32

Table 17: Frequency count: I attend Chapel because I want to, not because I have to

And the corresponding visualisation of the proportional frequency count, by staff type:

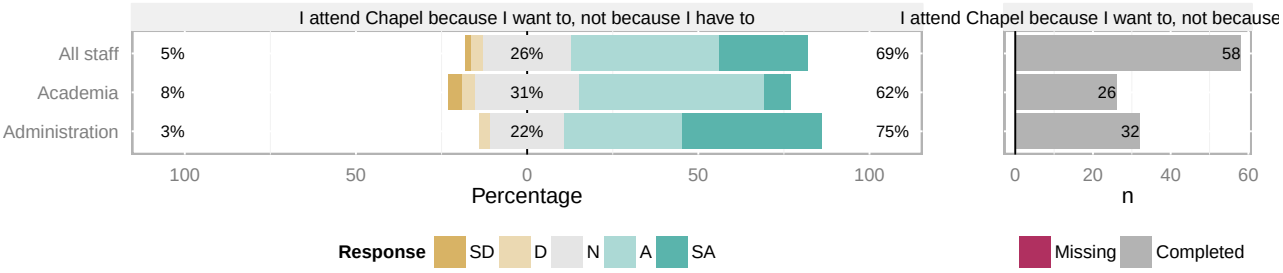


Figure 9: FIX ME

Who	What	Why
Academia	Agree	
	Disagree	
Administration	Agree	
	Disagree	

The mission and vision of the College has been clearly communicated to me

	SD	D	N	A	SA	Sum
All staff	0	2	1	32	23	58
Academia	0	0	0	14	12	26
Administration	0	2	1	18	11	32

Table 19: Frequency count: The mission and vision of the College has been clearly communicated to me

And the corresponding visualisation of the proportional frequency count, by staff type:

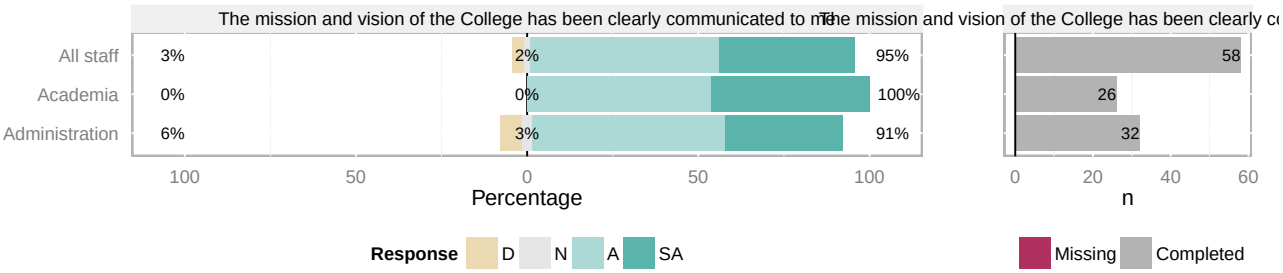


Figure 10: FIX ME

Who	What	Why
Academia	Agree	
	Disagree	
Administration	Agree	
	Disagree	

I consider my office area and staff facilities adequate in order to perform my duties

	SD	D	N	A	SA	Sum
All staff	1	5	9	28	15	58
Academia	0	2	4	12	8	26
Administration	1	3	5	16	7	32

Table 21: Frequency count: I consider my office area and staff facilities adequate in order to perform my duties

And the corresponding visualisation of the proportional frequency count, by staff type:

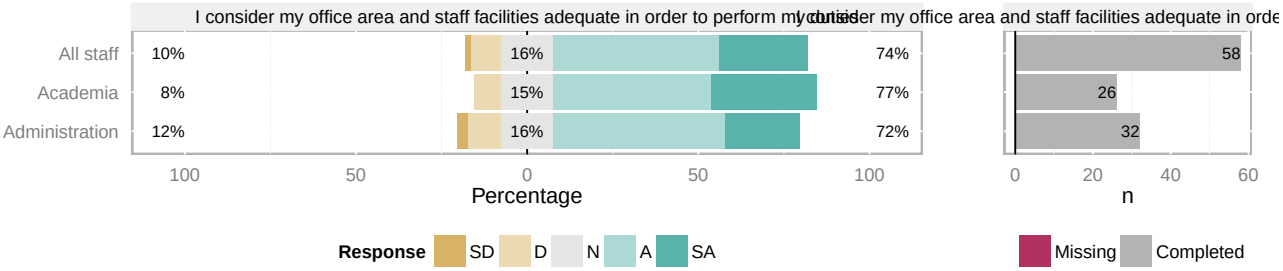


Figure 11: FIX ME

Who	What	Why
Academia	Agree	
	Disagree	
Administration	Agree	
	Disagree	

I am likely to recommend AC as an employer of choice

	SD	D	N	A	SA	Sum
All staff	1	3	8	24	21	57
Academia	0	1	5	11	8	25
Administration	1	2	3	13	13	32

Table 23: Frequency count: I am likely to recommend AC as an employer of choice

And the corresponding visualisation of the proportional frequency count, by staff type:

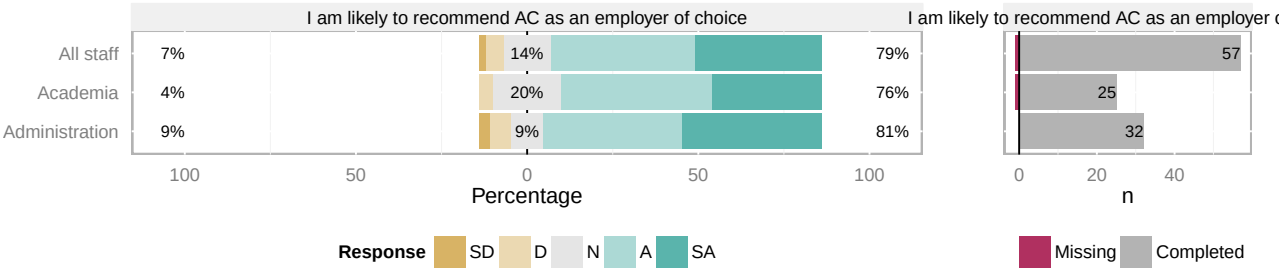


Figure 12: FIX ME

Who	What	Why
Academia	Agree	
	Disagree	
Administration	Agree	
	Disagree	

Areas for further study

- Time series
- Independence of Academic and Administrative responses
- Correlations
- Time of response predictive of sentiment

Appendix 1: