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FLAME (version 1.1). CNRS, 2012. http://www.mae.u-paris10.fr/lesc/spip.php?article63

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Free-List Analysis under Microsoft Excel (FLAME) is a free add-in for Microsoft Excel that helps analyze free-list data. Free lists are open-ended questions in which respondents list all of the members of a cultural domain, such as the domain of animals or the domain of illnesses (Weller and Romney 1988). Free lists differ from ordinary open-ended questions in that the respondents are asked about what exists in the world (or really, their culture) as opposed to revealing something about themselves. A free list of illnesses, therefore, is not a list of what illnesses the respondent has had but rather a list of names of things that the respondent considers to be illnesses.

The free listing task is often used a first step in a cultural domain analysis to obtain a set of locally relevant items to work with. For example, after obtaining a list of frequently mentioned illnesses, the researcher might ask respondents to judge the similarity between pairs of illnesses or rate the illnesses on attributes such as contagiousness or severity. Individual free lists are also quite interesting to analyze because they show evidence of how people organize the world. For example, free lists of animals obtained from U.S. respondents tend to contain sequential blocks of animals that correspond to North American forest animals (e.g., deer, fox, rabbit), zoo animals (e.g., giraffe, lion, hippopotamus), household animals (e.g., cat, dog), and so on. In addition, respondents show a marked tendency to put unusual, unconventional, and highly particular items at the ends of their lists (e.g., Blue-footed Boobie) and more prototypical, prevalent, and generic items at the beginning (e.g., cat).

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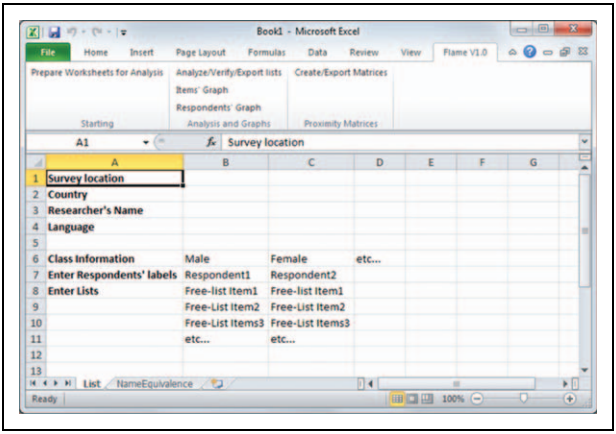

Figure 1. The FLAME tab in the Excel ribbon. FLAME = Free-List Analysis under Microsoft Excel.

As noted in the user's guide, the program is based on the free-list capabilities of ANTHROPAC (Borgatti 1996) and produces almost all of ANTHROPAC's outputs as well as a few new ones. Being based in Excel gives FLAME two very welcome advantages: (1) the numerical outputs are already in a spreadsheet and therefore immediately usable; and (2) the graphics are very nice. A third advantage we might add is that, in a sense, the typical user already knows how to use much of the program, because it is just Excel. The program is delivered either as an add-in (which means it appears in the Excel ribbon, as shown in Figure 1) or as a macro-enabled workbook. The add-in option is more convenient, although you do have to install it. The best thing to do is to copy the Flame_v1.1.xla file to the Excel's AddIns folder. On modern installations, this is C:\Users\[username]\AppData\Roaming\Microsoft \AddIns. If the file is placed there, then in Excel you can choose Options and then AddIns and Flame will be among the choices.

Running the program, I found that it gave the same answers as ANTHROPAC, except when there were errors in the data. For example, if a respondent listed "rat" early on and then mentioned it again later in their list, FLAME counted it twice, whereas ANTHROPAC ignored the second mention. FLAME does have a button labeled "Verify Lists," which will highlight duplicate items in the same list. There's another button that lets you delete the duplicates if you want to. This is safer than taking automatic action, as ANTHROPAC does.

Data entry in FLAME is very simple: Free lists are entered as parallel columns of data, as shown in Figure 2. When you run an analysis, the

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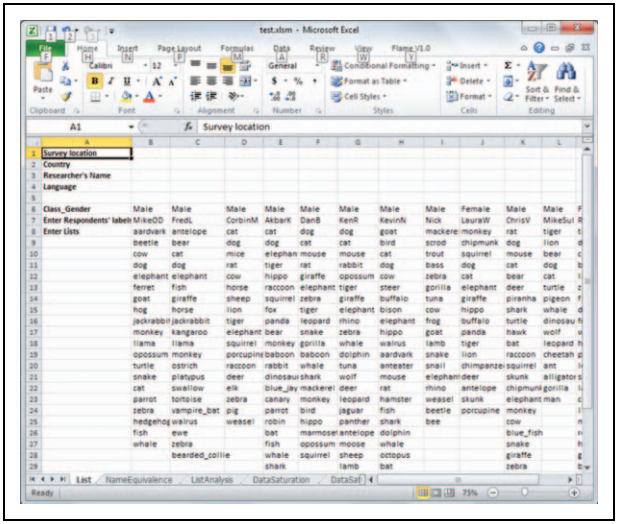

Figure 2. Free-list data are entered as columns in the spreadsheet.

program asks where the data are, so they could be anywhere in the workbook, including in a separate tab. Similarly, the program asks where to find the respondent IDs and any attributes of the individual respondents you may have, such as gender or location. This makes the program very flexible and allows the user to format things according to taste. Conveniently for users of ANTHROPAC, the add-in also has the capability of reading in an existing ANTHROPAC-formatted file.

The principal output of FLAME is a list of all distinct items mentioned, along with their frequency of occurrence. In addition, two salience measures, Smith's S (Smith and Borgatti 1997) and the Sutrop index (Sutrop 2001) are computed that give high scores to items that: (1) are listed by many respondents, and (2) are mentioned early on in people's lists. The highest possible score would occur for an item mentioned by every person and always listed first.

One of the main uses of free lists is to obtain a list of items to use in further data collection and analysis (e.g., asking respondents to sort items into piles based on similarity). The question is where to do draw the line. Typically, we want enough items to properly represent the domain, but no more than necessary. Drawing on factor analysis, one approach to solving this is to use a scree plot, which plots the frequency (or salience) of each item, sorted in descending order (see Figure 3). We then look for the point

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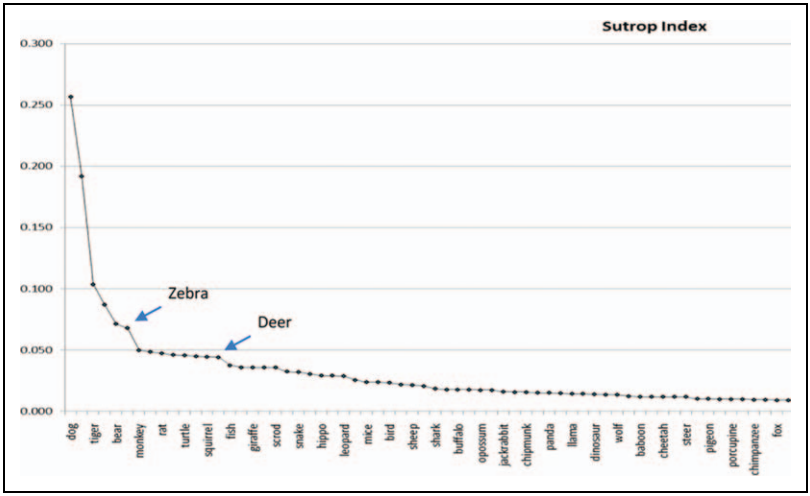

Figure 3. Scree plot in which the *x*-axis consists of free lists items sorted by frequency and *y*-axis is the frequency.

just before a precipitous decline in salience. For example, in the figure, one such point is item Zebra (just left of Monkey). Another is item Deer (just left of Fish). FLAME provides a button to draw such a chart, and indeed can plot multiple measures of salience at the same time. And since this is all in Excel, if the user doesn't like the chart, he or she can just change it.

A nice option in FLAME is the ability to produce item-by-item proximity matrix that indicates how often and/or how near each pair of items occurred in the same respondent's. One version, following Henley (1969), is based on the average distance between list positions, normalized by list length. The other is a simple count of the number of lists in which each pair of items is adjacent. As noted above, items tend to cluster sequentially in lists, so these proximity matrices can be submitted to cluster analysis or multidimensional scaling to reveal patterns of similarity and difference. On my data with 309 items and 92 respondents, calculating this matrix took quite a while, which is perhaps one disadvantage of programming in Excel.

Another set of outputs are respondent-level statistics, such as the length of each person's list and the commonness (e.g., the average or total frequency) of the items they mention. The higher the average frequency of a person's items, the more we see them as conventional or prototypical since they tend to mention the items that everyone else mentions. Also, a list that has a high

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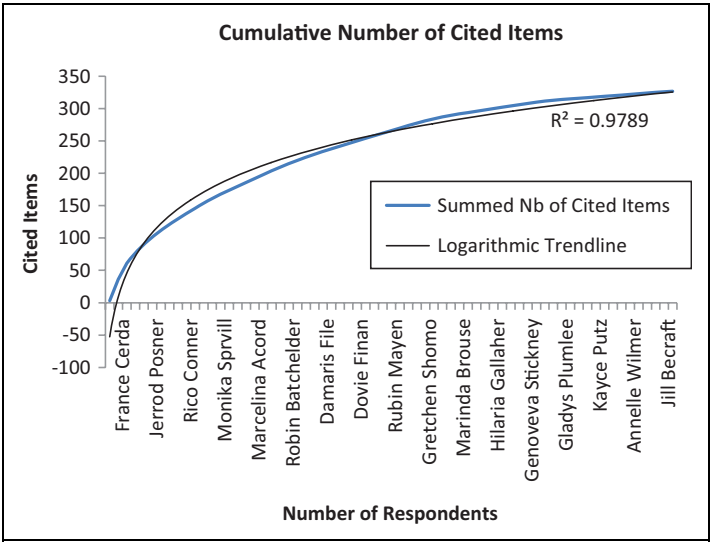

Figure 4. Cumulative number of distinct items as a function of the number of free lists collected.

total frequency can be seen as highly representative because it includes a lot of domain items, including the more commonly mentioned ones.

FLAME also computes the correlation between word frequency and its rank in an individual's free list. Normally, we expect a negative correlation because people tend to mention common words early. When a person doesn't have a negative correlation, it indicates an unusual respondent—perhaps a member of different subculture.

An interesting feature that FLAME has that ANTHROPAC does not is an analysis of data saturation. The goal of this analysis is to determine at what point you have collected enough data. The intuition here is that if you ask people to list animals, initially each person interviewed contributes several new items that you hadn't seen before. As you interview more people, you notice that the rate at which new items are being added begins to drop. This suggests that the cumulative number of distinct items would follow something like a logarithmic curve (i.e., one that has a steep slope at first and gradually flattens out as you acquire more respondents; see Figure 4).

The FLAME authors maintain that when your distribution looks logarithmic (as measured by an R^2 statistic), you have reached saturation and

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can stop recruiting respondents. This idea seems promising, although there are some complexities. An earlier version of the program assumed that the order of respondents in the data file was somehow meaningful. Entering them in a different order gave a different distribution and a different degree of resemblance to a logarithmic curve. The current version starts with the respondent with the shortest list and then adds respondents in an order corresponding inversely to the number of new items they add. This seems like a good heuristic for maximizing fit to a logarithmic-like curve, but clearly other approaches are possible as well. On completing the saturation analysis, the program nicely tells you how many respondents were needed to generate all of the mentioned items (in my case, only 67 of the 92 respondents were needed to generate all 327 items).

Another potential use—less practical and more theoretical—for this kind of thinking is to assess the age or status of a cultural domain. Imagine if we ask members of a single culture to free list items that have not been codified as a domain (and that, tellingly, don't have a simple name, such as "things that can happen on Tuesdays"). It could take thousands, even millions of people to begin to see a logarithmic flattening. In contrast, a well-codified domain such as animals begins to flatten right away. In the extreme case, a domain like months of the year is flat from the beginning.

All in all, the program worked well. Naturally, there were some glitches here and there. I found that the AddIns tab in Excel ribbon would occasionally disappear (I'm running Office 2013) but would reappear if I moved to a new cell or pressed some other keys. I also found that if I saved a completed analysis, when I reopened it I would still have to rerun some of the analyses—it didn't "know" the data it needed had already been generated. The documentation is very good but needs updating. For example, the instructions are based on an old version of Excel that won't quite match many users' versions. I found this version to be quite stable: The program never crashed as long as I did everything right. When I did screw up, I had to restart Excel.

Overall, I found this to be a useful and appealing program. I think it is well worth trying.

References

Borgatti, S. P. 1996. *ANTHROPAC 4.0*. Natick, MA: Analytic Technologies.

Henley, N. M. 1969. A psychological study of the semantics of animal terms. *Journal of Verbal Learning and Verbal Behavior* 8:176–84.

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Smith, J. J., and S. P. Borgatti. 1997. Salience counts—And so does accuracy: Correcting and updating a measure for free–list–item salience. *Journal of Linguistic Anthropology* 7:208–9.

Sutrop, U. 2001. List task and a cognitive salience index. *Field Methods* 13:263–76.

Weller, S. C., and A. K. Romney. 1988. *Systematic data collection*. Vol. 10. Newbury Park, CA: Sage.

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