

The Frequency Distribution Mechanism: Accounting for Two Radically Different Changes in Names and Other Tastes. (To be published in Proceedings of ICOS Conference on Names in Time and Space. 2006.)

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**Abstract**

In a number of nations, the turnover in popular names has been increasing substantially for a century or longer, but the concentration of tastes decline only modestly even as the turnover accelerates. A novel theory, employing a feedback mechanism, is developed to account for divergent trends in name turnover and name concentration. Usually overlooked in cultural analysis is that the frequency of a taste is itself a taste, which affects the numbers who will find it attractive and the likelihood of adopting it. In addition, the population will differ in the level of frequency that they find attractive or unattractive. Hence there is variation in the esthetics along a popular-unpopular continuum. Also, the esthetic dispositions are likely to change over time with progressive cohorts.

This paper describes a mechanism that can account for surprising and paradoxical changes over time in the frequency distribution of first names. It employs a process normally ignored in the virtually infinite array of explanations offered to account for changes in the popularity of a name. Beyond this, we are impressed with the relevance of this mechanism for all types of cultural changes-- even when choices are assumed to be made on substantive grounds. The paper has three parts. First, the mechanism initially applied to names is generalized; second, its application to naming tastes is reviewed; and, finally, we suggest a wide range of applications.

**Frequency Distributions**

Almost all elements of culture, whether material or ideational, can be described as a Frequency Distribution, in the sense that there is variation within the population in the specific features. All of us are aware of frequency distributions (whether using the term or not.) For example, when we think of the age composition of a society, or the income distribution, we are basically talking about a frequency distribution. This is not the usual

way we think of culture, but a moment of reflection will make it clear that tastes in movies, novels, art, scientific research, administrative procedures, or criminal sentences can each be described as a frequency distribution. Namely, the specific tastes range along a scale all the way from a high concentration on one disposition to a distribution that is almost evenly spread across various options. Musical tastes, for example, will vary between subsets of the population (age, race, gender, or social class.) Although social scientists may talk in over-simplified or stereotyped terms (e.g., operas are an “upper-class” taste), what we mean is that the class distribution of audiences at an opera will differ from the distribution of the population as a whole. Still, we can readily see that the audience can be described in terms of the percentages represented by various classes. Describing these tastes as if they were part of a frequency distribution--in the same way as an income distribution or attitudes towards minorities--makes sense. Similarly, a frequency distribution could be employed to describe virtually all features of material or ideational culture--whether it be the audience for different television shows, the topics currently studied by philosophers or biologists, the features of marriage (relative roles of men and women), the software used in home computers, the brands purchased, and the like.

From this perspective, terms that we often use--*popular* and *unpopular*--can be thought of as a qualitative way of describing a trait's quantitative position on a frequency distribution. Namely, the former refers to a relatively common attribute and the latter refers to an attribute that is relatively infrequent. The distinction between quantitative and qualitative analysis breaks down, then, in the case of frequency distributions. Popular or common, unpopular or uncommon are simply terms used to describe *part* of a frequency distribution. Likewise, describing changes over time in a cultural element (or differences between societies at the same time) is nothing more than comparing the place of a characteristic on a frequency distribution for two different times, or in the latter instance, comparing two societies at the same time. Frequency distributions are of special interest not merely because they enable us to see the relative popularity of its attributes, but also the form of the frequency distribution. As such, the terms “popular” and “unpopular” are insufficient. This is worth noting. Comparisons over time in the naming process illustrate this very nicely. Of all boys born in England between 1550 and 1799, essentially half

were given one of three different names (usually William, John, and Thomas) and likewise half of the girls born in this period were named Elizabeth, Mary, or Anne. By contrast, the most popular girl's name was given to just 4 percent of girls born in 1990. The three most popular girl's names among those born in England at the end of the eighteenth century includes a far larger proportion of all births than does all the 20 most common names for girls born in 1990 (respectively, 57 versus 38 percent.) (See Lieberson and Lynn, 2003, pp. 238-239, and the sources cited therein). The point is that the frequency distribution describes several phenomena, the position of choices and, separately, also the degree of concentration.

First names exhibit an odd pattern for the nations studied; beginning in the latter quarter of the nineteenth century and onward through the entire twentieth there is an accelerating increase in the turnover in popular names. This is strikingly different from the very slow rates of change prior to that time such that a leading name would enjoy long spans of prominence before declining. On the other hand, the level of concentration does not decline anywhere near as rapidly. It certainly does decline--witness the comparisons in England discussed above. But not at the pace you might expect, given the turnover in names. The odd pattern is that the level of concentration among leading names fails to shift as rapidly. Consider the ten most common girls' names in Scotland in 1982, and the changes experienced ten years later (Table 1). With the exception of Emma, these names decline in popularity during the ten years. In any case, we are particularly interested in the magnitude of the shifts either downward or upward. The sum of the changes is 8.60 percent. The relevance of this figure becomes clear when we start with the same ten names in 1982, but this time look at the frequencies of the names occupying the top-10 positions in 1992 (Table 2). Of the original ten, five are no longer in the top-10. Of the remaining five, all but Emma have declined in their ranking. Yet, we see that the names occupying each position are more or less at the same popularity level as the ones that were replaced. The sum of the percentage differences is 2.94, as contrasted with 8.6 for Table 1. This is not a fluke based on a specially selected period. For nearly the entire Twentieth century, Figure 1 compares the changes in the top-10 names during ten-year periods with the changes in the popularity distribution itself of the names now occupying these ten positions. Turnover goes up at an accelerating rate and

the levels of concentration also change over time, but at a steadier and slower pace--in no way reflecting an accelerating turnover. In effect, the newly popular names have a very similar frequency distribution to that of the previously popular names. This is remarkable, and suggests to us the operation of a taste for frequency.

### **The Frequency Distribution: A Feedback Mechanism that is Both Cause and Effect.<sup>1</sup>**

At this point we apply this mechanism to names, keeping in mind that the theory is applicable to a variety of domains (discussed below). The frequency distribution of a taste is typically viewed in substantive terms: as a probabilistic coupling between the subject's tastes and dispositions, the specific features of a name that leads the subject to think of the choice as particularly attractive, and institutional influences that can impinge on the outcome. The latter is illustrated by Fujimura (1988) who finds that organizations that fund research programs directly impact on scientific research even when there is no inherent merit over alternative problems. In the case of naming practices, this usually entails one or more substantive features of the name, say the appeal of: A biblical name; an invented name; a name with or without a certain sound; an association of the name with a person that we like or dislike; the connection with an ancestor; a political or social linkage; or the semantic qualities suggesting beauty or strength or intelligence or loyalty, and the like. However, there is another quality involved in tastes that is not substantive, but entails *form* rather than *content* (Simmel 1957). We refer here to the name's *existing* frequency of usage (in other words, its place on a describing popularity-unpopularity frequency distribution). The thesis is that the existing popularity of a name (or other tastes such as musical performer or a restaurant) affects its level of appeal or antipathy to the person making the choice. In other words, it is not the name per se that is the only dimension to choice, but also its location on a frequency distribution.

The frequency distribution of choices affects later choices as it interacts with the disposition of the making of new choices. Some parents have a preference for an invented name, or a rarely used name that is part of the standard repertoire. Other parents favor

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<sup>1</sup> Parts of this theory are stated more fully in Lieberman 2000: 154–58.

names that are uncommon, with other parents varying along a continuum such that we eventually encounter parents who resonate only to highly popular names. In practice, it may be hard to analytically separate the factors in the choice made by a parent, but we have no problem visualizing such a taste. In other words, parents respond to the apparent popularity of names such that, in a crude way, names gain or lose appeal as a function of the name's popularity coupled with parental dispositions towards the existing level of usage. Of course, tastes towards popularity in names are not necessarily the same when it comes to other matters. If we put names aside and think of clothing, it is easy to visualize popularity as a taste. For some, any item of clothing is automatically unattractive because it *is popular*; for others, a novel style is unappealing because it *is novel*. Were the latter style to eventually become popular (through a mechanism described below), some of those who earlier rejected the fashion would then find it appealing. On the other hand, those who were initially attracted to the novel style would be looking elsewhere. In this way, although the specific styles change over time, a roughly constant frequency distribution would result such that the proportion purchasing popular, unpopular, rare, or traditional fashions would all remain fairly stable.

The condition described above would be a simple and static matter were it not for three features that lead to a highly complex and dynamic model of popularity: 1) the appeal of a given level of popularity varies within the population; 2) there is a dynamic collective process that can alter the popularity of a name and therefore its appeal to different subsets of the population; and, 3) the dispositions towards various levels of popularity can change over time.

Since not everyone has the same disposition towards popularity, the dynamics of popularity tastes is unending. If the disposition towards various frequencies were "fixed" in the population, then the relative popularity of different names would still change as a function of these dispositions. As we observed above, at one extreme, there are persons for whom a name cannot be too popular--or at least for whom the maximum limit is very high. At the other extreme are parents who prefer a unique name that is invented or, at least, is rarely used. And other popularity dispositions range between these two extremes: some parents are attracted to names that are not unique but are infrequently given; others are attracted to names with somewhat greater popularity, and so forth. In

effect, then, we can visualize a distribution of parents (or persons choosing a restaurant and so forth) who range from attraction to something undiscovered to those who find a highly popular name (or restaurant, etc) particularly appealing. If, for the moment, we visualize the distribution of popularity tastes remaining unchanged over time (in other words, the percentage of parents with various tastes remains constant as new parents replace older ones), even then the appeal of the same name can still change, with its popularity decreasing or increasing accordingly. Start with the extreme: parents attracted to an invented name, say *Stanleyetta*, may give their daughter this name (although they have a virtually infinite set of possible names meeting their criterion), but if a few parents do choose it independently of one another, then this name will no longer be favored by parents with such a disposition--parents will move on to a different possibility. On the other hand, parents inclined to a relatively uncommon name, but not a totally rare one, may now be attracted to *Stanleyetta* even though earlier its uniqueness would have made it unattractive. And this sort of process of replacement or succession can go on along the scale such that a name that is say the fiftieth most popular name (and hence unattractive to all sorts of parents with a disposition toward less popular names) on the other hand could now appeal to parents who find this level of popularity attractive. At the extreme, we can visualize a set of parents who are attracted to a highly popular name, but not to an infinitely popular one--as it were--and hence the appeal begins to turn downward if popularity increases. In other words, the appeal of *Stanleyetta* or *Madison* or *Elizabeth* is affected by more than its "intrinsic" qualities. Rather, it is also affected by its popularity. If a declining but recently popular name does not immediately regain an attraction to those with tastes for less popular names, then the name is likely to remain "contaminated" for others and decline accordingly. However, there is every reason to think that there is also a decline with each succeeding cohort in the disposition to favor names that reach high levels of popularity. As a consequence, the shape of the frequency distribution changes over time.

These two conditions have an interesting consequence that we can evaluate empirically. If the disposition towards different levels of popularity is constant within a population (and is spread out across a wide range and is not overwhelmingly located at one point of the popularity disposition), then the forces generating turnover in names are

likely to have far less impact on the popularity distribution of names. This is assuming relative stability in the distribution of tastes for popular names. The names would come and go, but if the popularity niches are largely constant, different names will fill the same niches over time. In other words, if there is a substantial taste disposition for names of a given range of popularity, then those leaving that range for any reason will be replaced by other names occupying the same popularity distribution.

In summary, there are four conditions to consider:

- 1) A population that varies in their taste on a continuum ranging from attraction to names that are *rare and unique* at one end and “*very*” *popular* at the other.
- 2) A dynamic collective process where the appeal of a name will be altered if its popularity changes; it will lose appeal to new parents who would have been attracted at an earlier period and, in turn, gain appeal to other parents who would have found the name unattractive at its earlier state of popularity.
- 3) The distribution of tastes for various levels of popularity can change over time. Note that we use the term “distribution” because it is not that everyone now wants a unique name and nobody wants a popular name, but rather that the proportions favorably or negatively disposed towards various points on the continuum may change over time.
- 4) There is an “error” factor. There is no reason to expect instant response to shifts in a name’s frequency, since information and networks are imperfect. A sudden upward burst might easily go beyond an implicit disposition limit before a correction occurs.

## **Evidence**

All of this is an interesting and complicated matter. The danger of ending up with a circular argument that uses the observed changes to provide evidence for its own explanation is not trivial. For example, if we see that more parents are giving their children uncommon names (which indeed is the case), then we cannot explain this as a reflection of changing dispositions towards such names. If the explanation is valid, then it is necessary to obtain independent evidence of a changing disposition. Otherwise, the observed change becomes the evidence for its own cause. The empirical questions are also challenging because the observed distribution need not be solely the product of the

propositions presented here. As noted above, there are profound issues of imperfect information feedback. At any given time, parents with a certain popularity disposition may make errors. They really do not fully know what is happening among other parents at the same time and hence may select a name they would not have chosen if they knew the current condition (or vice versa). Anecdotally, the senior author has met many parents who report giving their child a name that was more popular than they realized.

How well does the Frequency Distribution Mechanism work in accounting for changing naming practices? Since there is a detailed analysis in Lieberman and Lynn (2003), we will briefly summarize the results based primarily on the analysis of long-term data for England and Wales, Scotland, and the United States. In general, the pattern over time fits nicely with the implications of the feedback theory in terms of both declining concentration and increasing turnover. Moreover, we found direct evidence that there are frequency-linked tastes affecting the names given to sisters born in different years. The location along the popular-unpopular continuum of one girl's name tends to be similar to that of the name given to her sister. Put another way, parents who favor very popular names for one daughter also favor a name with similar popularity for the second one. Likewise, parents with a daughter that has a relatively uncommon name (say, one that is not in top 100 in the year of birth) also give a similarly unpopular name to her sister (Lieberman and Lynn, 2003, Table 4, p. 270). Indeed, when we divide highly popular names into those that were recently popular and those of relatively long-standing popularity, we also find that parents consistently favor one or the other subtype.

As noted earlier, although the evidence is very consistent with the implications of the theory, it is difficult to obtain tight support for the theory (although several of the results are difficult to explain with alternative models). In any case, we considered several plausible alternatives derived from important social processes known to be occurring during the period. These are the relocation of the population from smaller communities to large urban areas in which anonymity could change the context under which concentration in names operates; the increasing diversity of the population due to the numerical importance of immigrant groups with different historical tastes in names possibly coupled with the decline in the pressures to adopt existing tastes (and therefore reducing the overall level of concentration even if concentration within the

earlier groups remained constant); and, the use of high speed computers to tally up-to-date information on current tastes in names and the use of the Internet, which permits the rapid spread of this information to parents contemplating a name for a newborn child. These technological developments allow for faster responses to changing tastes than in earlier periods. Finally, we considered the increasing turnover in the popularity of names observed at the outset to see if this accounts for declining concentration as well.

Alas, the evidence for what is *plausible* does not appear to *stand up*—granted that our data in some cases are less than ideal. A cautious conclusion is appropriate: the current data do not lead us to believe that these alternative causes are even partially responsible for the long-term decline in concentration.

### **Broader Ramifications**

The Frequency Distribution Mechanism is important on several dimensions. The location of choices on a Frequency Distribution (ranging from relatively popular to relatively unpopular) and the form of the distribution (ranging from highly concentrated among a small number of choices to a level of low concentration) are important. First, because these distributions affect later behavior and ignoring what led to their initial form (a task that can generate an infinite regression back in time), we can view the existing forms as being highly relevant to current and future choices. This is due to the fact that one of the dimensions of taste is the existing frequency distribution. The disposition can vary for different choices. Becker (1996), for example, speculates about a situation where a highly popular choice is an attraction, as in a popular restaurant. But this need not be the case for other choices or for the same people in different contexts. The key, though, is that frequency is itself a taste--and we believe it ranges over a wide array of activities and choices. Hopefully, this paper and the data cited on names which support it will encourage others to examine its relevance. It is crucial that this be recognized.

The popularity pattern for names has ramifications for various issues. There is great concern and speculation about individualism in the United States and elsewhere in the world. Has it increased? Declined? Or more or less remained the same? Deconcentration in the choice of names can be viewed as, in a certain sense, a matter of individualism

where parents have moved from a period where using a very popular name was either itself good or was a practice that was rarely questioned or at least rarely violated. Obviously, the naming pattern is but one indicator of the broad set of events that go under the rubric of “individualism.” However, such a profound shift is hardly trivial since it is an important choice involving one’s children. Moreover, since there are comparable shifts towards deconcentration in a number of other countries, there is no reason to think that the United States is unique in this shift (although, of course, we are painfully aware of the lopsided and selective set of nations that we are studying).

Also we have said very little about the gradual shift over time from a lopsided disposition towards high concentration to a far less concentrated set of tastes. This is a second influence, namely a decline in this correspondence that, we argue, reflects the declining inclination to choose highly popular choices. Is there such a shift? And, if so, what drives it? Unlike the other information, we do not have independent evidence that the dispositions have changed over time. All we do know is that the outcomes have changed radically. It is also difficult for us to propose with any confidence a satisfactory explanation for the shift. One possibility is that it is part of a broad and sweeping change towards individualism throughout the social order. If so, then independent measurements of other such changes are necessary. Another possibility that is not evaluated is that these changes occur in the absence of gradual shifts in the parental preference disposition. Remember, we are considering this as a collective process and such collective processes can generate outcomes that are far removed from the initial dispositions of the population. This is exactly the case for various segregation models that lead to outcomes quite contrary to the desires of most, but disequilibrium operates counter to these dispositions. This is a central question that remains to be fully resolved at this point.

In any case, we have an internal mechanism driving change that is radically different from a substantive taste. Indeed, the outcome is not simply a product of substantive taste. Rather, it is a set of parents who certainly have substantive preferences, but the choice within that set is based on the names’ perceived level of popularity. If the level of popularity changes or the perception of popularity changes then the theory suggests that a given disposition on the popularity-unpopularity continuum would now no longer find the name appealing. On the other hand, another set of parents with a

disposition at some other place on the continuum would now find the name appealing. Of course, this is an empirical question, but the linkage observed between sisters in the naming preferences of their parents supports this.

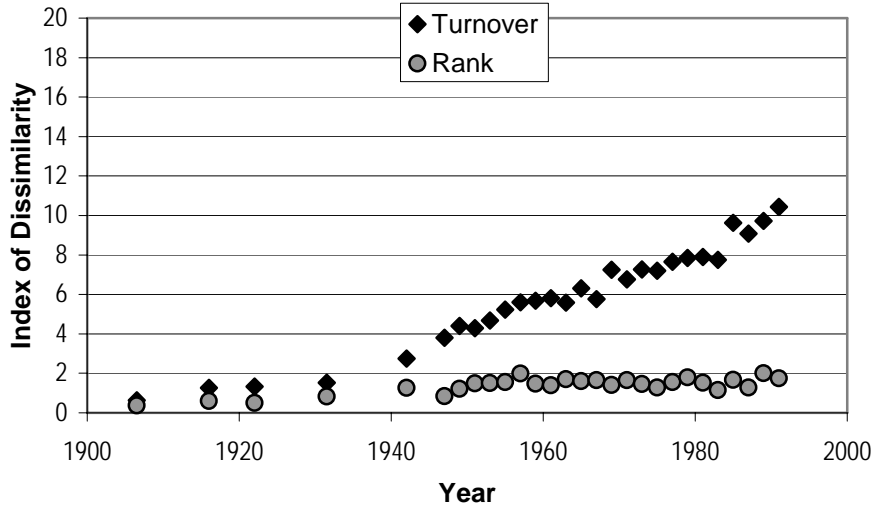
This analysis of concentration changes opens up a very general question involving the popularity-unpopularity continuum as a feature influencing all sorts of tastes. It can be as simple as names, with people having different dispositions towards, say, music, food, the arts, residential locations, clothing, physical attractiveness, haircuts, cosmetics, political and intellectual ideas, areas of interest in a scholarly domain, and the like that reflect their disposition based on popularity. Other tastes will be carried out within the setting of those dispositions. For example, a salesperson telling someone that an item of clothing is *very* popular might find some customers responding with enthusiasm and others repelled by the thought of wearing such an item. It is an open question as to what the popularity distributions look like for other types of choices; certainly there is no reason to assume the same distribution across the spectrum of tastes. Likewise, although we would speculate that people's popularity dispositions will tend to be correlated across items, we have no knowledge about the level of correlation. And, also, there is the question of whether subsets of the population (say educational, occupational, racial, regional, religious, conservative, or progressive) tend to differ in their popularity dispositions.

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Appendices:

**Figure 1: Scotland: Girls' Turnover and Rank Distributions, Comparative Changes Over Time, 1906-1992**



**Table 1. Index of Name Dissimilarity: Turnover in Names, Scotland, 1982 and 1992**

Ten Most Common Names, 1982		Same Names, Ten Years Later, 1992		Differences Used for Index of Dissimilarity
NAME	%	NAME	%	\Delta%
Laura	3.29	Laura	2.37	0.93
Claire	2.97	Claire	1.38	1.60
Lisa	2.51	Lisa	1.10	1.41
Michelle	2.31	Michelle	0.53	1.78
Nicola	2.23	Nicola	1.20	1.03
Sarah	2.08	Sarah	2.03	0.05
Louise	1.93	Louise	1.18	0.75
Jennifer	1.91	Jennifer	1.66	0.26
Emma	1.81	Emma	2.55	0.73
Kirsty	1.54	Kirsty	1.48	0.06

Sum = 8.60

**Table 2. Index of Rank Dissimilarity: Change in Popularity Distribution, Scotland, 1982 and 1992**

Ten Most Common Names, 1982		Ten Most Common Names, 1992		Differences Used for Index of Dissimilarity
NAME	%	NAME	%	\Delta%
Laura	3.29	Emma	2.55	0.75
Claire	2.97	Laura	2.37	0.61
Lisa	2.51	Rebecca	2.06	0.45
Michelle	2.31	Sarah	2.03	0.27
Nicola	2.23	Lauren	2.00	0.23
Sarah	2.08	Nicole	1.86	0.22
Louise	1.93	Stephanie	1.82	0.11
Jennifer	1.91	Amy	1.78	0.13
Emma	1.81	Jennifer	1.66	0.15
Kirsty	1.54	Rachel	1.56	0.02

Sum = 2.94