PHONOLOGICAL CUES TO GENDER IN SEX-TYPED AND UNISEX NAMES

ANNE FREDRICKSON
SWARTHMORE COLLEGE

A growing body of literature suggests that phonological features of English names may provide cues to gender (Slater & Feinman 1985; Cutler et al. 1990; Barry & Harper 1995; Cassidy et al. 1999; Whissell 2001): women's names tend to have a larger number of syllables, end in a vowel, and display non-initial stress, while men's names are shorter, end in a consonant, and have primary initial stress. Prior to these studies the sex-typing of names in Anglophone culture was thought to occur only through convention; if phonological cues are in fact exploited by English speakers – that is, if they are meaningful - they challenge both the principle of arbitrariness (Saussure 1959) and the argument that names are pure referencing expressions (Coates 2006). In a series of small trials, this paper explores both the social conventions and linguistic strategies of sex typing; the Phonetic Gender Score (Barry & Harper 1995), a quantitative analysis that predicts the gender of name based on its phonology, is used to evaluate both conventional, sex-typed names and unconventional, gender-ambiguous ones. Surprisingly, many of the phonological features of English female names are present in unisex names as well, which provides a linguistic explanation for the instability such names often experience. The Phonetic Gender Scale is also used to generate novel unisex names, from which English speakers attempt to infer gender. Taken together, these three studies suggest a certain inability (or aversion) on the part of speakers to conceive of subjects apart from their sex.[*]

INTRODUCTION

"It is [the] rule, and not the intrinsic value of the gestures that obliges one to use them."

FERNINDAD DE SAUSSURE

"One is not born, but rather becomes a woman."

SIMONE DE BEAUVOIR

Language is an organizational system completely contingent upon its agents. Governed by individual behavior, it is vulnerable to anarchy (every speaker could use different sounds to refer to the same things), but in order to be successful – that is, communicative – language must be conventionalized. Post-structuralist theories of gender fall along the same lines, arguing that

[*] I am happy to acknowledge the wonderful guidance of Donna Jo Napoli, faculty advisor, and David Harrison, faculty reader, as well as helpful comments from Twan Claiborne and Jeff Kaufman. Thanks again to Jeff, and also Emily Gasser, for time spent creating the recording for the study, and to Nick Gaw and Ronald Kim in the

the category of gender is itself fictitious, fragile, and perpetuated only by ritual (Butler 1990). This parallel is not coincidental; both language (in the way we uphold it) and gender (in the way we maintain it) are specific cultural institutions, and within them we can locate the production – and control – of the subject itself (Foucault 1979).

Consider the phenomenon of naming as it exists in the United States: though many factors influence the selection of a name, the determinant that usually fixes a parent's choice is the child's sex; even if a mother had her heart set on naming her child after a beloved uncle, if the child is biologically female she is highly unlikely to name it *John* (though she might settle for *Johanna*). Sex is generally the first thing parents want to know about their child; before the advent of ultrasounds and amniocentesis, midwives employed a number of techniques to predict a baby's sex, many of which continue today in folk traditions and lore: if you are carrying low you'll have a boy, if you crave sweet things you'll have a girl, etc. The strong impulse to assign gender even prenatally is part of a larger practice feminist scholar Sandra Bem (1993:80) calls *gender polarization*, "the ubiquitous organization of social life around the distinction between male and female." This supposed "natural" distinction, however, is hardly a universal principle – there are cultures that identify and employ more than two sexes, among them the *kathoey* of Thailand (Jackson 1997), the *Hirja* of India and Pakistan (Nanda 1990), and the *berdache* ("two-spirit") of various Native American tribes (Jacobs et al. 1997).

In the United States, however, ambiguous gender categories are largely suppressed. While Fausto-Sterling (2000) estimates that as many as 1.7% of all births are intersex,[1] the

---

Swarthmore College Phonetics Lab. I am also grateful to Dan Hammer for advice on statistics, and the thirty students who took the time to participate in my experiment.

[1] Intersex most generally refers to any child born with both male and female genitalia, indeterminate genitalia, or chromosomal variants that can later result in conditions such as Klinefelter's syndrome, in which males born with an extra X chromosome (XXY males) may eventually display female secondary sex characteristics (National Institutes of Health 2006).

majority of these cases are medically "corrected" with surgery or hormone therapy. That Western science often treats intersexuality as pathology reveals further the depth and power of gender norms; as Kessler (cited in Dreger 1998:167) writes, having ambiguous or multiple genitals is not "threatening to the infant's life but...threatening to the infant's culture." In the United States (and the West in general), this is a culture that conventionally operates within unequivocal categories of "male" and "female," a polarized gender system which demands agreement between biological sex and psychological experience.

As a result of gender polarization, we are expected to have gender-appropriate names as determined by biological sex – and sex, in the most literal sense, sells. An entire industry has sprung up around sex-prediction and naming (not to mention the commercialization of fertility in general); parents-to-be can download Chinese baby calendars onto their Palm Pilots to increase their chances of conceiving a girl or a boy, use the "scientifically proven" sex-prediction formula at fortunebaby.com, or peruse the flood of books and websites currently devoted to the selection, popularity, and meaning of millions of different personal names. The vast majority of these resources categorize names by sex.

So here we have a gender rule (the idea of biological sex as "natural" difference) that leads to a reciprocal socio-linguistic practice (the projection of supposed sex differences onto a naming system); in the United States, names are usually drawn from a large but finite number of acceptable boys' names or acceptable girls' names. Note that this is the convention of naming; aberration, of course, exists, and is in fact a later focus of this paper.

But how do names get their gender in the first place? While native English speakers can easily infer that *Peter* refers to a male and *Anna* to a female, most are hard-pressed to explain why. It hardly even seems a conscious decision. Other languages have more transparent methods

of sex-typing names; Alford (1988) compared naming practices between the 60 societies of the Human Relations Area Files' (HRAF) Probability Sample and identified three distinct ways in which names can signal gender. (The HRAF sample, which includes one cultural group from each of the roughly 60 macro-cultural groups from around the world, is thought to be a fairly unbiased cross section of human experience; the randomly selected groups are geographically and technologically diverse, and range in size from a handful of members into the millions. Modern industrial societies such as the United States are excluded from the sample.) Drawing from the ethnographic information in HRAF, scholarly publications, and correspondence with researchers in the field, Alford found that among cultures that sex-type names (85% of the HRAF sample), gender can be inferred from the following:[2]

1) The semantic meaning of the name, which may make reference to gender or gender-roles
2) Morphological information in the name, such as a suffix or prefix
3) Knowledge about a culture's stock of typically male or female names

The last technique is the most common; Alford found that half the cultures that sex-type do so by convention.

Because the HRAF sample did not include the United States, Alford conducted a separate cross-cultural study on naming practices there, taking into consideration the current scholarly literature on American naming and attitudes towards naming as represented in American media. He also conducted interviews with 180 American mothers regarding how they named their children and concluded that, as with the majority of groups in the HRAF sample, names in the United States are sex-typed by convention.

[2] Although Alford (1988) did not comment on how many genders each culture recognized, in those that sex-type names we may assume at least two.

While it is true that English is hardly the inflectional language it once was, it is curious that Alford does not comment on the semi-productive processes by which many English female names are derived, especially considering his observation that 17% of groups in the HRAF sample distinguish sex morphologically. In English we derive *Roberta* from *Robert*, *Patricia* from *Patrick*, *Johanna* from *John*, *Nicole* from *Nicholas*, *Earline* from *Earl*, etc., though the average speaker may not be actively aware of such patterns. Obviously there is not a clear paradigm for these derivations, but they do suggest that convention alone is not an adequate description of sex typing in English names – there appears to be a linguistic, name-internal influence as well.

A growing body of literature argues that the sound structure of a name may signal the sex of its referent (Slater & Feinman 1985; Cutler et al. 1990; Barry & Harper 1995; Cassidy et al. 1999; Whissell 2001). This is not to say that English speakers infer gender completely from name phonology; convention, most likely, plays a larger role. But the possibility of phonological cues to gender must be considered seriously, for if any such cues exist they pose a challenge both to Saussure's principle of arbitrariness (1959) and to recent claims regarding the reference of names (Coates 2006). Furthermore, because it reinforces a perception of sexual difference, a name phonology split along gendered lines may also encourage unconscious sexist behavior, and reveals some of the more covert strategies we use to sort people into stereotyped categories.

What we have excluded in the discussion so far, however, are unconventional naming practices in English: assigning a child a name traditionally given to the opposite sex (Johnny Cash's "a boy named Sue"), creating an entirely new name for a child or adopting another word as a name (*Apple*, the infamous name of Gwyneth Paltrow's daughter), turning a surname into a first name (*Harrison* is a popular example), or using a name that is not clearly sex-typed

(unisex), such as *Robin, Dana,* or *Casey*. One might claim that the possibility of naming outside the established two-gender system weakens that system's effect on linguistic and social practice. Instead, I propose that unconventional approaches to naming are in fact exceptions that prove the rule: in practice, unisex names are so unstable as to call the category itself into serious doubt. As I will argue in this paper, trends in unisex naming only offer further evidence of gender polarization in United States, suggesting a certain inability (or aversion) on the part of speakers to conceive of subjects apart from their gender – be they ambiguously sexed or multiply sexed.

Section 1 provides an extensive review of the previous research on English name phonology and gender, which has focused mainly on Anglophone naming practices in the United States and Great Britain. I discuss the asymmetrical distribution of phonological features in English men and women's names and the possible reasons for this asymmetry. I also introduce Barry and Harper's (1995) Phonetic Gender Score (PGS), a quantitative scale that assigns a positive or negative value to a name based on its phonology and predicts the sex of its referent from that number. The simplicity of the scale makes it a useful tool for the studies conducted in section 2. Having established the existence of certain phonological patterns (regardless of their origin), I then describe the effects that these structures have on name selection, perception, and our ability to infer gender from novel names. Finally, I examine the evolution and status of unisex names in the United States over the past century.

Section 2 is broken up into a number of smaller studies. The first study re-evaluates the legitimacy of the PGS by applying it to a set of phonologically typical English male and female names not originally considered by Barry and Harper (1995). The next study examines how the scale deals with unisex names, which also were not anticipated in its design. Having recognized the relative advantages and disadvantages of the PGS, the final study exploits the parameters of

the scale to generate novel, supposedly less sex-typed names, which are then classified as male or female by native English speakers in an experiment testing the bases of gender inference.

Taken together, these studies demonstrate a tendency – or need – of speakers to project specific, readable gender onto names. As the third study suggests, this information can be calculated using no input other than name phonology, a strategy that parallels the use of phonological cues in assigning grammatical category (Kelly 1992). If speakers have an implicit understanding of phonological cues to gender it may also account for recent trends in what I term "gender-masking:" using specific phonological features or unisex naming to prevent others from deducing one's gender. Gender-masking, though potentially advantageous for women confronting sexist stereotypes in the workplace, has somewhat sinister implications for the feminist movement as a whole, especially considering the cultural value Bem (1993) terms *andocentrism*: taking male experience and identity as the norm.

Section 3 summarizes the need for further investigation into name phonology, sex typing, and gender-masking. I suggest several avenues for new research, especially in languages that may also use phonological cues to gender. In order to better integrate name phonology into a larger, more cohesive theory of names, broader cross-cultural study is also needed, both in communities that do not sex type their names and in those that do.

Section 4 concludes briefly with a note on gender and theories of proper names ("properhood"). While Coates (2006) argues that proper names are pragmatic, and any meaning we infer from them is strictly a result of convention, I demonstrate how the phonological cues to gender convincingly presented in this paper complicate his claims.

This paper looks at one way in which language, commonly assumed by speakers to be "outside of" cultural attitudes and beliefs, can implicitly support a specific social agenda. Bem (1993:2) reminds us,

> As profound as the transformation of America's consciousness has been during the last 150 years, hidden assumptions about sex and gender remain embedded in cultural discourses, social institutions, and individual psyches that invisibly and systemically reproduce male power in generation after generation.

It is only when we examine institutions such as language that we understand how pervasive our gender system is, and the ways in which it forcefully limits what men and women can be, do, and experience.

1.1 ENGLISH NAMING PRACTICES AND SEX ROLES

In her 1965 study on kin relationships in American families, Rossi polled 347 middle-class mothers from the Chicago area on how they selected first and middle names for their children. Of the 951 children discussed in the interviews, 70% of boys were named after a relative, while the same practice applied to only 52% of girls. Rossi interpreted the strong tendency to name sons consanguineally as a symbolic extension of paternity; it is a conventionally male responsibility to "carry on" a family (in both surname and bloodline), and giving sons a kin-linked name, she concluded, emphasizes their role as future *paterfamilias*. Even when sons in Rossi's sample were named outside of the family, the majority of them received historical, Biblical names, a source which, again, focuses heavily on lineage and ritual naming. Daughters, on the other hand, when given non-kin-linked names, were most likely to be named after a friend of their mother. Rossi also found that the concentration of boys' names was greater than for that of girls'; that is, a smaller pool accounted for the names the mothers chose for their sons.

As part of his monograph on American naming practices Alford (1988) repeated Rossi's (1965) study, interviewing 180 Oklahoma mothers (including unwed women, which Rossi did not) about naming selection for their 424 children. The study produced very similar results to Rossi (1965): 67% of sons but only 46% of daughters received the name (first or middle) of a relative, and of those that did not, girls were more likely to be named after friends, neighbors, or celebrities. Given such sources, Alford suggests that the selection of girls' names is based primarily on aesthetics, which, due to historical changes in taste, accounts for their diffuseness. In light of this observation, the study concludes that the tendency to give boys more traditional or kin-linked names, which stresses their patrilineal responsibility, reflects "a general cultural value emphasizing attractiveness for females and accomplishment for males" (Alford 1988:134).

Alford (1988) also investigated name-givers in American naming practices. In the Oklahoma sample, 60% of the 424 naming decisions were made mutually by the mother and father, 27% primarily by the mother, 9% primarily by the father, and a remaining 3% by someone else (often a grandparent).[3] Because joint-decisions by both parents appear to be the most common method of name selection, we shall refer to name-givers as "parents" for the remainder of this paper, understanding that names are (obviously) also given by single mothers and single fathers, as well as relatives and friends. Neither Rossi (1965) nor Alford (1988) recognize the fact that the label "parents" may also includes lesbian and gay couples; both interview sets focused exclusively on a normative model of the family (though Alford did include single mothers in his interviews). I have not come across any literature specifically on how lesbian or gay couples name their children, most likely because their decision-making process is no different from the practices Alford describes in the Oklahoma sample. Thus I

[3] These are the figures reported in Alford (1988); their sum is 99%. It is unclear if the missing 1% belongs to a mathematical error or some other, unreported name-giver.

propose that the somewhat loaded term "parents" stand in for the more neutral "name-giver," if only for the sake of economy and style.

In the United States, children are named quickly (though much forethought may go into the decision); most states require a child to be named within seven days of its birth (Alford 1988:125). Aside from timeliness, however, there are no other constraints placed on name selection; though names are conventionally chosen according to sex, parents are free to use any name they like for their child, including a name that is not clearly sex-typed, or one that is traditionally used for children of the opposite gender. Such instances are rare, as will be discussed shortly, but it is not the case, as it was for many of the groups in Alford's (1988) HRAF sample, that unconventional or novel names selected by the parents would be deemed unacceptable by those in authority. For evidence of this laissez faire approach to naming one need look no further than the United States Social Security Administration, where the legal registration of names takes place: in 2000, social security numbers were issued for not one but two boys named after the popular sports channel ESPN (BBC International News 2003).

Given such freedom of choice, the process parents use to select a name for their child seems, prima facie, highly idiosyncratic. When observing naming trends over time, however, definite patterns emerge, and not only from the convention of sex typing. Lieberson and Bell (1992) studied how names can also convey race and class – a signification that, in a socially stratified world, makes them extremely powerful. As status indicators names belong to part of a more general pattern of social taste which Bourdieu (1984) calls the *habitus*. The habitus is characterized by perpetuity; social tastes tend to reproduce themselves over generations and within certain gender and class boundaries – as do names. Similarly, the habitus is not a formal organization; Lieberson and Bell (1992:514) comment on the fact that "although institutional

activities such as the mass media and popular culture can and do affect naming practices, such influences are an unintended by-product rather than an organized effort to direct and mold tastes." There is, of course, an industry devoted to helping parents choose a name for a child (baby name books and websites), but it does not appear to have a specific goal in mind beyond promoting the mapping of meaning – and thus destiny – onto names: "the cult of the perfect name."

As a study in social taste, Lieberson and Bell (1992) looked at a random sample of all the names given to children in New York state for every year between 1973 and 1985 – a total of 193,142 births. The study sought to compare naming trends over time and across categories of race and class. When looking at the names of the white children, Lieberson and Bell's findings matched an observation also made by Rossi (1965): boys' names are more concentrated than the girls' names. The twenty most popular names for white boys between 1973 and 1985 account for 45% of the white boys in their sample, while the twenty most popular names for white girls account for only 31%. Additionally, Lieberson and Bell found that, within the white sample, the popularity of girls' names shows significantly faster turnover than that of boys'; in fact, a study by Zelinsky (cited in Alford 1988) found that of the ten most popular names from a 1790 New England census, six of them (*John*, *William*, *James*, *George*, *Thomas*, and *Joseph*) remained among the ten most popular names in a similar census conducted in 1968. Lieberson explored the popularity phenomenon of sex-typed names in a later study (Lieberson et al. 2000) and found that over the past century the average "life expectancy" of boys' names, as judged by the number of years a name is included in the top 200 names for boys, was 47 years, while the analogous life expectancy for girls' names lasted only 30 years.

Trends in sex-typed names also occurred across racial categories; for both African American and white children, girls were more likely to receive an unconventional (uncommon or novel) name, though the probability was much higher for African American girls. Apart from this observation, however, the authors limit their commentary on racial differences to a section entitled "A Brief Note About Black Names" in which they concede, "an extensive analysis of black names merits a separate paper" (521). That paper has since been written (Lieberson & Mikelson 1995; Fryer & Levitt 2004); the remainder of Lieberson and Bell (1992) focuses mainly on name selection across class lines.

Names are one of the only status markers not constrained by socioeconomic position (Lieberson & Bell 1992:523). Simply put, you don't have to be rich to have a rich person's name; parents' income level or profession does not limit the number or type of names available for their child. Class differences in naming are especially interesting, therefore, because they reveal social tastes unmitigated by economic resources: names are what Bourdieu (1984) might call *cultural capital*.

In addition to their random sample of children's names, Lieberson and Bell (1992) also obtained information on the education level of each child's mother. Using education level as a stand-in for class, they divided the children's names into groups depending on how much time the mother of that child spent in elementary school, high school, college, and any post-baccalaureate institutions. Looking at names in the sample of while children, the authors observed that mothers with a higher level of education were more likely to give a son a traditional, popular name but use an unconventional name for a daughter. Throughout their study, however, Lieberson and Bell did not comment on name-givers in the United States – that is, although they used the educational level of the mother as a rubric for class, ostensibly

assuming that the mother was the primary name giver for each child, they did not consider statistics such as Alford's (1988), which claims that 60% of naming decisions in the U.S. are done mutually. How did the father's education level, if there was a father, affect their findings? We may accept Lieberson and Bell's study cautiously, but it does not allow for any conclusive messages to be drawn regarding class and name selection.

To summarize: there appear to be organizational practices at work, more of which will be discussed below, in the habitus of names. Girls' names are 1) more likely to be novel or non-standard, 2) less stable historically, and 3) drawn from a larger pool than boys' names. The relative conventionality of a name also seems to affect who will choose it; mothers with a higher level of education are more likely to choose conventional names for boys and unconventional names for girls. Lieberson and Bell (1992), much like Alford (1988), suggest that such trends reflect pervasive gender stereotypes in our culture; girls' names are valued aesthetically, as are women themselves, while boys' names, rooted in tradition and kinship, reinforce an essentialized male identity centered around the ability to sire children.

1.2 PHONOLOGICAL DIFFERENCES IN ENGLISH MALE AND FEMALE NAMES[4]

Though onomastics – the study of names (Mawer et al. 1927; Pulgram 1954; Tournier 1975; Ingraham 1996) – appears even in the dialogues of Plato (see *Cratylus*, Sedley 2003), the study of name phonology is a fairly recent endeavor (Slater & Feinman 1985; Nemer 1987; Rialland & Mamadou 1989; Bakken 2002).

In 1961, Brown and Ford (cited in Slater & Feinman 1985) noted that male names tend to be contracted more frequently than female names in English, which suggests a possible structural

difference between the two. It was not until 1985, however, that any comprehensive evaluation of the sound patterns of sex-typed English names was attempted. Slater and Feinman (1985) compared the phonological structure of the given and preferred names ("the name you like to be called by") of 489 college students – 222 female and 267 male. The names, which were solicited via questionnaire, were phonemically transcribed by two independent evaluators into North American English (from here on referred to as "English") and coded for the following structural features: length of name in phonemes, length of name in syllables, type of syllables in a name (open or closed), name-initial phonemes, name-final phonemes, and prosody.

Though the exact definition of a syllable continues to be debated, the idea of syllable as unit is helpful for descriptive purposes; Ladefoged (2000:230) writes, "in one sense, a syllable is the smallest possible unit of speech," aspects of which include consonant and vowel sounds (there are also valid arguments that the smallest unit of speech is the phoneme or the articulatory gesture). Typically, though not always, a syllable is characterized by the presence of a vowel, and can be further divided into the *onset* and the *rime*. The onset consists of all consonants preceding the vowel; the rime includes the vowel or vocalic part of the syllable (called the *nucleus*), any glides onto or off of it, and all consonants following it (known as the *coda*). A tree diagram of syllable structure is given in Figure 1:

[4] Throughout this paper, I use the term "phonological cue" to include any aspect of the phonetic signal that is salient

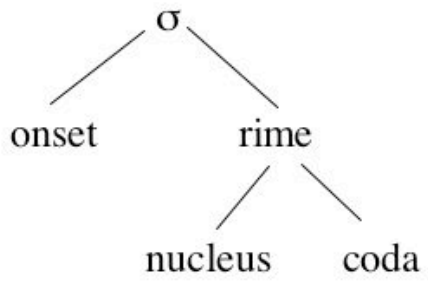

Figure 1. Syllable structure.

Different languages allow for different syllable structures. Syllables in Hawaiian, for instance, have only one consonant in the onset and none in the coda, which means that every word in the language ends in vowel (Ladefoged 2000: 230). Any syllable without a coda, such as those in Hawaiian, is called an "open" syllable, while any syllable with a coda is referred to as "closed."

Slater and Feinman (1985) found that the women's names in their sample contained significantly more phonemes, more syllables, more non-initial stress, and at least twice the number of open syllables than the men's names. Over half the women's names ended with an open syllable (ended in a vowel), and of those that did not the majority ended in a sonorant consonant (nasals and liquids; [m], [n], [ŋ], [ɹ], or [l]). Men's names, conversely, were much more likely to end in a consonant, particularly a non-sonorant consonant (obstruent). They were also more likely to be monosyllabic – or, if polysyllabic, contain initial primary stress.

Both men and women in the study preferred to be called by shorter forms of their given names, which included both names with fewer syllables and names with fewer phonemes (*Elizabeth* to *Liz*, *Harris* to *Harry*). In addition, participants favored forms of their names that contained initial stress or ended in a consonant (*Christine* to *Christy*, *Timothy* to *Tim*). These

---

to and perceived by hearers.

features are identical to the sound patterns Slater and Feinman identified in English male names; the constellation of male characteristics in the subjects' preferred names suggests that both men and women want more masculine "sounding" names. Slater and Feinman concluded that, given current and historical male privilege in Western society, women may consider having such a name advantageous.

The study also noted that the phonological features of the preferred names closely match those of most "native English words" (1985:438), which tend to contain few syllables, initial stress, and end in a consonant (ostensibly, the authors are referring to English words of Germanic origin). Structurally, Slater and Feinman also commented on the fact that much of the phonological differences between male and female names occurred at the end of the name, which mimics a tendency in English to use word-final position as a morphological marker – *cat* to *cats*, *happy* to *happiness*, etc. The similarities between English name structure and linguistic processes in English reinforce Slater and Feinman's original idea that sex-referencing information is contained within the sound structure of English itself, in what they term a "covert categorizing principle" (1985:438).

Expanding upon the similarities between the sounds of preferred names and the sounds of common English words, Cutler et al. (1990) compared phonological patterns of men and women's names with the general phonological patterns of English. English favors bi-syllabic words with initial primary stress, and as part of the English lexicon, the authors argue, English names should do the same. They extend this reasoning to hypothesize that English names will not differ structurally from other English nouns. This hypothesis, however, which seems intentionally set up for rhetorical weight, proves blatantly false; Cutler et al. found that the sound structure of male and female names does differ systematically in English.

After categorizing 1,667 names from *The Oxford Minidictionary of First Names* (Hanks & Hodges, 1986) according to stress pattern and syllable structure, Cutler et al. (1990) found that female names were significantly less likely than male names to contain initial stress, and significantly more likely to have three or more syllables. While these structural patterns are convincingly presented in the study, comparing them with that of English nouns seems entirely unnecessary; the broad assumption that names are completely identical to other nouns, as opposed to constituting a special class or epiphenomenon of nouns (Coates 2006), is a dangerous one, and will be touched upon later in the paper.

Though a less linguistically oriented study, Lieberson and Bell (1992) also noted a few phonological differences between male and female names. In a random sample of given names for white children in New York state, they found that a girl's name was significantly more likely to end in [ə] while a boy's name was more likely to end in a consonant. As opposed to Slater and Feinman (1985), however, they saw no significant difference in the distribution of [n], which those authors had claimed was more likely to be the final phoneme of a female name.

Incorporating the observations of Slater and Feinman (1985) and Lieberson and Bell (1992), Barry and Harper (1995) developed the Phonetic Gender Score (PGS), a quantitative scale that assigns a positive or negative value to phonological features which appear to correlate with gender. The scale evaluates a name on two measures: one score for stress placement and one for the name's final phoneme, and the two numbers are added together to produce the final score. The PGS was designed to produce positive scores for female names and negative scores for male names; scoring "0" is somewhat of an afterthought. Though such a score may indicate that the name is less clearly sex-typed, it is unclear if the design is intentional. "Degrees" of femaleness and maleness are also represented in the scale; a name that ends in [ə], for example,

which is an overwhelmingly female characteristic, is given a higher score in the category of final phoneme (+2) than a name which ends a full, unreduced vowel such as [i] (+1). The PGS rubric, as it appears in Barry and Harper (1995:812), is reproduced below:

> The first scale, which applies to the pronunciation of the entire name, has the following scores:
>
> +2: The accent is on the second or later syllable. Examples are *Nicole* and *Denise*.
> +1: The accent is on the first of three or more syllables. Examples are *Brittany* and *Christopher*.
> 0: The accent is on the first of two syllables and the name has fewer than six phonemes. Examples are *Mary* and *Michael*.[5]
> -1: The name has one syllable. Examples are *John* and *James*. The names have fewer than six phonemes.[6]
> -2: The accent is on the first of two syllables and the name has six or more phonemes. Examples are *Robert* and *Edward*. The names contain more consonants than vowels.[7]
>
> The second scale, which applies to the last phoneme, has the following scores.
>
> +2: The last phoneme is the unstressed, mid-central vowel, also called a "schwa-like" vowel sound (Lieberson & Bell, 1992). Examples are *Donna* and *Joshua*.
> +1: The last phoneme is any vowel except the unstressed, mid-central vowel. Examples are *Ashley* and *Andrew*.
> 0: The last phoneme is a sonorant consonant, which is either nasal (*m, n,* or *ng*) or resonant (*r* or *l*).[8] Examples are *Kathleen*, *William*, *Carol*, and *Tyler*.
> -1: The last phoneme is an obstruent consonant, which is either fricative or affricate.[9] Examples are *Joseph*, *Kenneth*, *James*, *Mich*, and *George*.
> -2: The last phoneme is a plosive consonant, also called a stop (*p, b, t, d, k,* or *g*). Examples are *Philip, Jeb, Robert, Richard, Mark,* and *Greg*.

---

[5] It is suggestive from the example of *Michael* that the PGS treats diphthongs as a single phoneme, though Barry and Harper (1995) does not explain why. *Michael* in fact has six phonemes if the diphthong is interpreted as a sequence of vowel sounds. (Although *Michael* could still interpreted as having five phonemes if the second syllable were treated only as a consonant and a syllabic [l], there are no other instances of syllabic [l] in similar names such as *Daniel*, which is scored on the PGS as having six phonemes.)

[6] It is unclear whether having fewer than six phonemes is a condition for assigning a score of -1 or simply an observation by the authors. Most monosyllabic names will naturally have less than six phonemes due to the syllable structure of English, which allows for at most three consonants in the onset and two in the coda.

[7] This statement, too, is redundant, as which suggests that both this and the phoneme description discussed above are not conditions for scoring, but merely observations of Barry and Harper.

[8] Nasals and liquids make up the class "sonorant consonants," so it is unclear why this information is included.

[9] This is my wording; Barry and Harper seem to have mistakenly classified some fricatives as affricates in their original text: "The last phoneme is an obstruent consonant (*f, v, th, s,* or *z*) or affricative (*sh, ch,* or *j*)." We can infer that *sh* refers to the alveolar fricative, and *j* to the voiced post-alveolar affricate (the authors do not use IPA in their article).

I have presented the scale in full because I will later be commenting on its oversights. In Barry and Harper (1995), however, there was a significant correlation between a name's PGS score and the sex of its referent. When applied to a combined corpus of the 100 most popular male and female names from 1950 and 1990, the PGS assigned a positive value to 72% of the female names and 17% of the male names, and a negative value to 67% of the male names and 5% of the female names. Averaged over both years, female names received a mean score of 1.50 and male names a mean of -1.02, which was highly statistically significant. The authors conceded that the scale does not always correctly predict a male or female name (*Joshua* received a score of +3 and *Kathleen* a score of -2), citing that the conventional use of these names can easily override something like phonological features, even if those features are salient cues to gender. Still, the authors emphasize that the strong correlation between a name's PGS score and the sex of its referent makes the scale a valuable tool for further applications in name phonology.

Recognizing the need for a measure that would consider name structure as a whole, without having to isolate key features through somewhat dubious ordering principles, Cassidy et al. (1999) created a connectionist model of phonological cues to gender. Connectionist models are essentially a network of interconnected units, theoretically a representation of neural processing, which can produce powerful and insightful simulations of how the mind learns and evolves. A connectionist model is ideal for exploring phonological cues to gender, because the model must learn to recognize the relationship between the sound structure of a name and the sex of its referent, which the network does by using probabilistic formulas. These algorithms control the exchange between each unit; once the model receives feedback on its performance it immediately adjusts its probability base in order to further its chance of achieving the correct

output in the next trial. This adjustment affects the connection weights, that is, the strength with which one unit is connected to and thus influences the outcome of another. Fluctuation in connection weights, known as activation, can tell us something about the confidence of the model; a strong connection weight between two units represents a high probability that they are related, and sets in motion of chain of connections which, if the model has enough information to calculate the probability of each connection, will produce the correct output.

In Cassidy et al. (1999) the connectionist model employed three layers of simple computer processing units: the input layer, which consisted of 44 units meant to represent different phonological features (number of syllables, number and location of vowels, consonants, stress placement, etc.); the output layer, which consisted of 2 units that represented a male or female name; and a "hidden" middle layer consisting of 15 units that represented the statistical and probabilistic relationships between the input of a name and the output of a gender. The model was trained on a corpus of names taken from the Connecticut Category Norms (Battig & Montague 1969). Of the 235 male names and 255 female names listed in the category norms, 98 were randomly selected and removed from the sample. The model was trained on the remaining 392 names, and the names that had been removed were used to test the model after the training period was complete.

Over ten trials, the connectionist model classified 80% of the test names correctly, which was far beyond the chance value for the study. A "correct" classification was considered to be any instance in which, given the input of a name, the mean activation score of that name's appropriate gender node in the output layer was greater than the mean activation score of the inappropriate gender node. Though the model was remarkably accurate in inferring gender from name phonology, even more useful information came from the activation values for each output

node, which indicated how confident the model was in its decision to classify a given name as "male" or "female." While the model correctly classified both *Christopher* and *Daniel* as male names, for instance, the mean male activation value for *Christopher* (.94) was higher than that of *Daniel* (.76). In this way we can say that the model was more confident in labeling *Christopher* a male name – and because the system had nothing other than name phonology as input, we can conclude that *Christopher* is somehow "more" of a phonologically typical male name than *Daniel* (consider, as well, the fact that *Daniel* differs from *Danielle* by stress alone, which suggests it may have more feminine phonological features than a name like *Christopher*).

The greatest strength of the connectionist model lies in its ability to recognize novel cues to gender previously inaccessible to researchers (these are known as "transitional probabilities" in the connectionist literature). While studies like Barry and Harper (1995) were forced to consider individual phonological features in isolation, the connectionist model incorporates all the relationships between the cues, learning not only the patterns discussed earlier, but also identifying new interaction effects. The model in Cassidy et al. (1999) produced high male activation scores for names beginning with consonant clusters, names containing the sound [eɹ] in their first syllable, and names incorporating the vowels [e] or [ɪ], providing strong evidence that these features, too, may be cues to gender.

The studies presented in this section demonstrate that phonological information is asymmetrically distributed in male and female English names, though it is not yet clear if these patterns are meaningful. Table 1, below, presents a summary of the findings discussed thus far. We cannot say the features described in the table are salient phonological cues to gender, however, until we look at the real strategies speakers use to classify names (see Section 1.4).

Phonological feature	**Gender cue**	**Studies supporting**
Smaller number of phonemes	Male	Slater and Feinman (1985); Barry and Harper (1995)
Smaller number of syllables	Male	Slater and Feinman (1985); Cutler et al. (1990); Barry and Harper (1995); Cassidy et al. (1999)
Initial stress	Male	Slater and Feinman (1985); Cutler et al. (1990); Barry and Harper (1995); Cassidy et al. (1999)
Consonant final	Male	Slater and Feinman (1985); Cutler et al. (1990); Lieberson and Bell (1992); Barry and Harper (1995); Cassidy et al. (1999)
Stop consonant final	Male	Slater and Feinman (1985); Barry and Harper (1995); Cassidy et al. (1999)
Obstruent consonant final	Male	Slater and Feinman (1985); Barry and Harper (1995)
Word initial consonant clusters	Male	Cassidy et al. (1999)
Internal [e] or [ɪ]	Male	Cassidy et al. (1999)
[eɹ] in first syllable	Male	Cassidy et al. (1999)
Larger number of phonemes	Female	Slater and Feinman (1985); Barry and Harper (1995)
Larger number of syllables	Female	Slater and Feinman (1985); Cutler et al. (1990); Barry and Harper (1995); Cassidy et al. (1999)
Greater ratio of open to closed syllables	Female	Slater and Feinman (1985)
Non-initial stress	Female	Slater and Feinman (1985); Cutler et al. (1990); Barry and Harper (1995); Cassidy et al. (1999)
Vowel final	Female	Slater and Feinman (1985); Cutler et al. (1990); Barry and Harper (1995); Cassidy et al. (1999)
Schwa final	Female	Slater and Feinman (1985); Cutler et al. (1990); Lieberson and Bell (1992); Barry and Harper (1995); Cassidy et al. (1999)
Sonorant consonant final	Female	Slater and Feinman (1985)

Table 1. Possible phonological cues to gender in English.

1.3 ORIGINS OF PHONOLOGICAL DIFFERENCE

Though the studies above assert the existence of specifically male and female name phonology, few offer substantial explanation why. Cutler et al. (1990) suggests that the differences may be sound symbolic, a notion that challenges one of the most basic principles in modern linguistics. Sound symbolism describes a system where, contrary to Saussure's principle of arbitrariness, the meaning of a word may be contained within the phonological structure of the word itself. Saussure (1959) makes the concession that sound symbolism may exist at the level of onomatopoeia and interjections, but points out that such designations also display a certain amount of arbitrariness (dogs in the U.S. say *bow-wow* but dogs in France say *oua-oua*) and exist at the periphery of language. "No one," he claims, "disputes the principle of the arbitrary nature of the sign" (1959:68).

As early as 1929, however, Sapir was conducting studies on what he termed "phonetic symbolism:" the link between sound and meaning. Subjects in Sapir's study were presented with contrastive pairs of pseudowords which differed only in their vowel sound and asked to determine which word referred to a large object and which to a small object. He found that there was an overwhelming trend to associate words containing [ɑ] – that is, a low back vowel – with large objects, and words containing [i] – a high front vowel – with small objects. "To put it roughly," Sapir concluded, "certain vowels…'sound bigger' than others" (1929:235). Known as *magnitude* or *synesthetic* sound symbolism, the relationship between the structure of a word and the size of its referent is the most widely corroborated form of sound symbolic phenomenon, especially the link between high front vowels and diminutive references (see the multitude of studies cited in Hinton et al. 1994 and Nuckolls 1999).

Ohala (1994) offers both an articulatory and ethological argument for magnitude sound symbolism; he locates it in the evolution of animals' communicative facial expressions, expressions that influence how sound is produced in certain positions. To appear large – that is, as a threat to one's enemies – animals often adopt expressions that produce lower fundamental frequencies (F_0), while a non-threatening expression such as a stretched mouth – a "smile" – will produce a sound with higher frequencies. Added to this is a direct relationship between the size of the vocal tract and the quality of the sounds it can emit; particularly relevant for this paper, Ohala notes that men have a larger vocal cavity than women, which allows them to produce sounds with lower frequencies, a characteristic he associates (evolutionarily) with aggressiveness and threat.

As Nuckolls (1999) notes, however, linguists are notoriously suspicious about any claims made by sound symbolists, as perhaps they should be. With the exception of Hinton et al. (1994) there has been little cross-linguistic examination of sound symbolic patterns; though many examples can be found it has been difficult to fuse the phenomena into any kind of universal theory, especially given the disproportionate concentration of sound symbolism in African languages and its relative scarcity in languages such as English (Nuckolls 1999). Even Cutler et al., which cites Ohala's (1994) ethological argument for sound symbolism as a possible factor in the phonological asymmetries between men and women's names,[10] is skeptical about the proposition, admitting that they "cannot provide a definitive explanation" for the patterns in the study (1990:480). Still, many of the other studies that establish a case for sex-typed name phonology seem to agree that whatever the cause for this distinction, it lies within the structure

[10] Cutler et al. (1990) speculates that women are perceived as small and non-threatening, which is symbolized even in their names.

of the English language itself – a silent but implicit endorsement for sound symbolism (see Slater and Feinman 1985; Cassidy et al. 1999).

Hough (2000) attacks Slater and Feinman (1985) and Cutler et al. (1990) for basing their analyses of English name phonology on what she argues is an inherently false premise. These studies, she writes, erroneously assume that names are functionally the same as nouns and behave – syntactically, morphologically, and phonologically – as such. While it is true that names operate as nouns (NPs) at the level of sentence structure, Hough points out (notably in line with the principle of arbitrariness) that "the phonetic structure of a word does not depend on function but on derivation" (2000:3). The various etymological origins of male and female English names, she argues, differ so drastically from the derivation of most other English words that we should in fact expect them to exhibit a skewed distribution of phonological features.

In fact, the phonological patterns observed in studies such as Slater and Feinman (1985) and Cutler el al. (1990) do fall fairly cleanly along etymological lines; polysyllabic, vowel-final words with non-initial stress are common to Romance languages, while consonant-final words with primary initial stress are more typically Germanic. Hough (2000) identifies three basic sources for English names: the Bible, classical mythology, and "vernacular" (that is, Germanic, Celtic, or Anglo-Saxon) traditions. In an analysis of the hundred most popular names for girls and boys in England and Wales in 1994, Hough found that girls' names are more likely to be Latinized while boys' names are drawn more from Hebraic and Germanic sources. Similar etymologies are mentioned in several other studies: Cassidy et al. (1999) notes that the final schwa common to English female names reveals the names' Latin roots; over 20% of the most popular girls' names in Lieberson and Bell's (1992) sample came from French, while the popular boys' names were drawn from Greek, Hebrew, or "English" (meaning Germanic); and of the 100

most popular names from 1950 considered by Barry and Harper (1994), boys' names had more German, Welsh, Gaelic, or "English" (in this case, possibly meaning Anglo-Saxon but unclear) roots, while names from Latin or Greek were more common among girls. Slater and Feinman (1985:438) also commented on the fact that the phonological traits they found in female names (longer names with non-initial stress) "frequently associate with foreign words," though the study provided no evidence for the claim. If by "foreign words" we may infer the meaning "non-Germanic words" (as English is a Germanic language) their observation further supports a now well-established pattern of Classical sources for girls' names.

While the etymological differences in men and women's names are undeniable, they do not inherently eclipse all other explanations for differences in the names' phonological structure. Hough claims historical and social factors are the cause: the Bible, for example, contains a great number of Hebrew names – but, as Hough notes, most of the people given names in the Bible are male, so more boys' names are drawn from this source, thereby over-representing a specific (Hebraic) phonological pattern in the lexicon of English names. Aside from this instance, however, Hough does not cite any other concrete evidence for why naming trends occur the way they do, leading to a curious silence on the question of why, in English, male names were consistently adopted from certain languages and female names from others. We can observe the effects of this history, but claiming name etymology as the underlying reason for the name differences discussed in this paper is completely circular logic. Surely German and Welsh have a stock of women's names, just as Latin and Greek have male names – why, then, are so many female names derived only from Latin and so many male names only from German? How did certain names become popular or incorporated into English in the first place? Though not within

the scope of this paper, the answer to these questsions may well lead us back to a discussion of sound symbolism.

What is most pertinent to the current study is not the cause of the demonstrated sound patterns but the fact that these sound patterns exist. Regardless of the origin there is substantial data to support the fact that in English, men's names are phonologically distinct from women's. In the absence of a gender-polarized culture such a pattern could still be considered completely arbitrary. As will be explored in the next section, however, there is nontrivial data to demonstrate that English speakers have in fact learned phonological cues to gender, and that these cues influence the ways in which we process names.

1.4 EFFECTS OF PHONOLOGICAL DIFFERENCE

Some of the most convincing evidence for salient phonological cues to gender comes from studies involving novel names. In Alpasch (1917), for instance, a subject was presented with a number of invented sounds and asked to describe a person who would have that name. While no specific characteristics were asked for in the description, the subject more frequently commented on the sex of the person with the novel name than on any other trait. In addition to revealing a strong tendency to link gender with names, even when not asked to do so, the study also provided preliminary evidence that sounds can cue different gender associations.

In the absence of any other information about a word, it is assumed that speakers will rely on phonology to infer that word's meaning or grammatical function (see Kelly 1992). In a way this sound-based strategy parallels the learning process of the connectionist model described in section 1.2; speakers (or the model) draw from their prior linguistic experiences to make probabilistic inferences about what a new word could mean or be.

Cassidy et al. (1999) tested English-speaking children and adults to see if they would use phonological cues to gender in assigning novel names to dolls. They created 9 contrastive (male-sounding vs. female-sounding) pairs of pseudonames that differed either in their stress patterns (e.g. [ˈdu.vɛt] vs. [du.ˈvɛt]), final phoneme (*Stoka* vs. *Stokat*) or number of syllables (*Foop* vs. *Falrobon*). Subjects were asked to match male and female paper dolls to a random selection of the pseudonames. Overall, both children and adults matched male and female dolls with pseudonames that displayed the appropriate male (one syllable, initial stress, stop consonant final) or female (three syllables, non-initial stress, vowel final) phonological features. The gender assigned to the pseudonames by participants was most significantly correlated with the stress pattern of the name. In the absence of any other information about these novel names, the correlation between the sound structure of a name and the gender it was assigned suggests that speakers may in fact be employing some of the phonological cues discussed previously. The children in the study (average age: 4.3 years) made choices very similar to those of the adults, indicating that phonological cues to gender are learned early in a speaker's life, most likely from exposure to male and female names and a basic understanding of sex differences.

Cassidy et al. (1999) also employed a subtler test of gender inference for adult speakers. As opposed to directly asking speakers to report on gender, the authors created sentence fragments using 34 male- or female-sounding pseudonames as the subject (constructed in contrastive pairs differing by stress pattern, final phoneme, or syllable number), and asked participants to complete the sentence as they thought appropriate. The choice of pronoun, then, served as an indicator if the participants classified the name as male or female. Unsurprisingly, the pronoun *he* was elicited more by sentence fragments with male-sounding pseudonames, and the pronoun *she* elicited more by sentences fragments with female-sounding pseudonames,

though, as opposed to the previous study, syllable number seemed to be the most significant factor influencing gender assignment. This second study corroborated the findings of the first: English speakers have learned phonological cues to gender.

Whissell (2001) constructed pseudonames from a small set of consonants and vowels in phonologically typical male- or female-sounding patterns of stress, syllable number, and final phoneme. Participants were asked either to classify the 32 randomly constructed names as male or female, or rate them on a 7-point scale of masculinity. The significant correlation between independent gender designations and masculinity ratings suggests that speakers infer gender even from randomly constructed names, and, Whissell concludes, use phonological cues in the absence of other information.

Though the studies above offer logically persuasive results, we must remain at least slightly skeptical as to their reliability. Both Cassidy et al. (1999) and Whissell (2001) assume that because their participants were presented with supposedly unfamiliar pseudonames – that is, names they had never seen before – they had to be making gender inferences based purely on name phonology. Neither Cassidy et al. nor Whissell, however, consider or discuss the effects that name priming may have had on their subjects. Among the names Cassidy et al. used to test the adult speakers are *Corla, Steban,* and *Dirg*, which could prime for the (conventionally recognizable) names *Carla, Stephen,* and *Dirk*. Though Whissell does not list the names she used for her study, she does include one example of a randomly constructed name from the study – *Meja* – which could prime for the name *Maya*. Without more information on the names in her study, this example calls into question how much Whissell's "randomly" constructed pseudonames resembled more familiar English names. For both Cassidy et al. and Whissell, the

extent to which priming effects influenced speaker judgment is unknown, but serves as instruction for future research.

Whissell, furthermore, had subjects read her pseudonames as opposed to listening to them. Though the names were "spelt in a way which encouraged pronunciation of the designated phonemes" (2001:857), the design provides no way to control for phonological interpretations of the written names, an oversight which casts doubt on how much we can rely on the study as a measure of phonological cues to gender. Given the paucity of research on phonological cues in general (see Kelly 1992), however, there is little else to draw from; the summaries of these probable phonological cues to gender are presented in Table 2.

Phonological feature	**Gender cue**	**Studies supporting**
Smaller number of syllables	Male	Cassidy et al. (1999); Whissell (2001)
Initial stress	Male	Cassidy et al. (1999); Whissell (2001)
Consonant final	Male	Cassidy et al. (1999); Whissell (2001)
Stop consonant final	Male	Cassidy et al. (1999)
Larger number of syllables	Female	Cassidy et al. (1999); Whissell (2001)
Greater ratio of open to closed syllables	Female	Whissell (2001)
Non-initial stress	Female	Cassidy et al. (1999); Whissell (2001)
Vowel final	Female	Cassidy et al. (1999); Whisell (2001)
Schwa final	Female	Cassidy et al. (1999); Whissell (2001)

Table 2. Probable phonological cues to gender.

If English speakers have learned phonological cues to gender, this knowledge may influence how parents choose names for their children. In addition to selecting a gender-appropriate name for a daughter or son, parents may also use their implicit understanding of

gender cues to choose the degree to which a name is sex-typed; the various activation scores of Cassidy et. al's (1999) connectionist model demonstrated that some names, phonologically speaking, are more masculine or more feminine than others. English speakers seem to employ a similar comparative scale in judging the attractiveness of names. Garwood et al. (1981) found a significant positive correlation between a name's desirability and the degree to which it is stereotyped as typically male or typically female; the most popular names are most often those that are also rated as very sex-role appropriate. Slater and Feinman (1985) demonstrated this stereotyped name preference linguistically: when the PGS was tested using the 100 most popular names for men and women in 1950 and 1990, they observed that the more popular names always received greater PGS scores (in terms of absolute value) – that is, the popular names contained more of the heavily weighted phonological cues to gender.

Studies linking name popularity and sex stereotyping suggest that the attractiveness of a name lies in its ability to effectively communicate gender – or, at least, it used to. More recent investigations reflect a growing trend to select unconventional, and therefore less clearly sex-typed names for girls. Lieberson and Bell (1992), as discussed previously, found that upper- and middle- class mothers were more likely to select unconventional names, phonologically or otherwise, for their daughters. Alford (1988) asked the mothers in his Oklahoma sample, largely a rural and lower-middle to middle-middle class group, if it was better to give an unusual name to a boy or a girl; his subjects overwhelmingly responded that an unusual name was better for a girl, with even a slight preference for unusual girls' names over common ones. While traditional, phonologically typical boys' names remain the most desirable for sons (Alford 1988; Slater & Feinman 1985; Lieberson & Bell 1992), there is a small but noticeable shift towards the phonological "masking" of gender in girls' names (recall also the preference women had for

more masculine-sounding nicknames in Slater and Feinman). The atypical phonological structure of most unconventional female names can create weaker gender associations that may unconsciously appeal to parents looking to give their daughters a competitive edge in androcentric culture. This interpretation provides an alternative to the theory that women's names are valued as purely "decorative" and therefore experience rapid turnover. The turnover may instead result from a constant search to find new, less-sex-typed names for girls. In fact, we can observe this trend in the use of unisex names in the United States over the past century, which is examined in the next section.

Though an effort to downplay the "feminine" in girls' names may initially seem like a step towards dismantling sex-role stereotypes, it becomes disturbing when one considers the stability that typical, traditional boys' names continue to enjoy (see Lieberson et al. 2000). Women's names are the ones that are changing, not men's, a practice that suggests women feel the need to attenuate obviously gendered attributes in order to be taken seriously or treated equally.

1.5 THE STATUS OF UNISEX NAMES IN ENGLISH

Unisex names, also known as androgynous or sex-ambiguous names, must be analyzed in a historical context, for the majority of them have drifted away or evolved from other naming categories over time. Cross-sex naming, though practically unheard of today, was observed as least as early as the 13th century, when it was a common practice in England to name daughters after male saints. Withycombe (1977) reports, "girls so named were in fact baptized and called Philip, Nicolas, Alexander, James &c" (cited in Lieberson et al. 2000:1250). Cross-sex naming may have been considered androgynous historically, but such a practice did not affect the sex of

referent of the name – even if a girl was called *Philip* it was understood that hers was still the name of a male saint. Unisex names today are those considered to be appropriate for both boys and girls, or, conversely, those names for which any number of reasons lack a clear sex of referent. Naming your daughter *John* does not automatically make *John* a sex-ambiguous name. If, however, an equal number of male and female children were named *John* in a certain year, it would indicate a definite trend away from a single-gender correlation for that name.

Distribution of names, in fact, is the operating principle by which Lieberson et al. (2000) tracked unisex naming throughout the past century. Using the Index of Androgyny, an algorithm that calculates the sex ratio of a given name based on its distribution between boys and girls in any given year, the authors plotted naming trends in Illinois for every year between 1916 and 1989, as well as 1995, drawing on information from birth certificate records. Given previous discussion on the conventionality of American naming practices, which includes clear sex-typing, it is unsurprising to learn that over the past hundred years, unisex naming has been exceedingly rare; for any given name in their sample, Lieberson et al. (2000) found that more than 97% of children with that name are of the same gender. Though unisex names continue to be exceptional, the practice has increased relative to 1916, especially among girls. Then, as now, however, when a name is given to both boys and girls, usage will always be more popular for one gender. Gender polarization appears to subvert even unisex naming practices; as Lieberson et al. (2000:1274) conclude,

> Androgyny per se is largely an unstable state: the names display a certain pullback in the usage for one sex if the other one begins to take off. Either the male or female usage of the name may gain a certain level of acceptance, but rarely do they both reach a similar level.

While this statement suggests that unisex names can – and, in fact, will become conventionalized as either male or female names, there are very few cases of the former shift.

Once the names are unstable, the vast majority of them become rapidly feminized. Barry and Harper (1982) tracked names appearing in American and British baby naming books from 1933, 1936, 1946, 1969, and 1979 and found that before unisex names become unisex names, they are usually exclusively male names. After enjoying a brief period of acceptance as a unisex name, however, the names quickly shift to the domain of the exclusively female. Names such as *Kim, Lindsay, Meredith,* and *Courtney*, for example, were all identified as male names by a majority of baby name books published between 1933 and 1946, but now are used primarily as female names. In the interim they were considered unisex. *Allison, Gillian, Ardith,* and *Shirley* were classified as unisex in the early sources but have since evolved into women's names, while many of the more familiar unisex names used today – *Casey, Corey, Dana, Jamie,* and *Robin* – were earlier listed as male names. There was only a handful of names swimming against the "male to unisex to female" current; *Marty*, for instance, which was listed as a female name in the 1930s, and *Keith*, which was once a unisex name, are now used for sons.

Barry and Harper (1993) followed up on their 1982 study by tracking the actual frequencies of unisex names given in Pennsylvania births in 1960 and 1990. Like Lieberson et al. (2000), the authors concluded that androgynous naming is hardly popular; though the frequency of names such as *Blair, Jordan, Robin* and *Casey* was four times higher in 1990 than 1960, the practice remains still relatively rare when compared to overall naming trends for that year. Barry and Harper (1993:22) interpret the public's reluctance towards using androgynous names as a reflection on the function of names; the advantages of sex-typed (that is, conventionalized) names, they argue, is that they "[distinguish] the owner from all people of the opposite sex," which they consider "a useful attribute." Indeed, in a world where men own the majority of companies, run the majority of universities, and fill the majority of government offices (Acker

2004), having a name that distinguishes one as a man is quite a useful attribute. Sex-typing may not be as advantageous for women, however, which is perhaps why the study found that when unisex names are given, they are always more popular for girls, and remain so for longer periods of time.

Apart from socio-cultural bases of androgynous naming, there also exists a linguistic explanation for the evolution of unisex names. Barry and Harper (1982) identified 32 unisex names that, prior to 1950, had been identified as exclusively male. When Cassidy et al. (1999) submitted these names to their connectionist model, they found that their female activation scores were significantly higher than the mean female score for the male names in Battig and Montague (1969) – i.e., they were more typically female in their phonology. The high female activation scores for unisex names that had previously been exclusively (historically) male – such as *Dana, Corey, Sandy*, or *Jerry* – suggests that a structural similarity to female names (or, at least, a dissimilarity to male names) may encourage lexical drift in otherwise conventionalized male names. Further support for this hypothesis came from another round of testing; 27 female and 11 male names identified as unisex before 1950 (Barry & Harper 1982) were submitted to the model. The male names produced significantly lower female activation scores, which could explain why they resisted the feminization that occurred with the other previously unisex names.

The phonological similarities between unisex and female names, as demonstrated by the high female activation scores the names produce in the connectionist model, slightly contradict Lieberson et al.'s (2000:1266) claim that unisex names evolve from what they term "unanchored names" – names with a lack of sex-typed characteristics. These include novel names, pet names or diminutives taken as given names, names with less sex-typed phonology, or names that

became unisex through parallel but non-related paths.[11] Looking at the ways in which Cassidy et al.'s (1999) connectionist model learned (and identified new) phonological cues to gender, however, we might argue that with so many possible patterns in English name phonology, there can be no such thing as a gender-neutral sound pattern. Because the naming system is already conventionally sex-typed, all possible phonological patterns could fall under a certain gendered category – we may have just not recognized them yet. If this were the case a unisex name would survive only by convention. The possibilities of such a condition are explored in the research section of this paper.

2.1 THE PHONETIC GENDER SCORE AND PHONOLOGICALLY TYPICAL ENGLISH NAMES

The Phonetic Gender Score (PGS), discussed in section 1.2, was created by Barry and Harper (1995) in an attempt to weigh the phonological features that seemed to correlate most closely with a name's gender. The scale is designed to predict the sex of referent of a name based on nothing more than its sound structure. Other than citing the work of Slater and Feinman (1985) and Lieberson and Bell (1992), and vaguely referring to the 50 most popular men and women's names of 1960 and 1990 (source unknown) however, the authors offer no details as to the logic by which they created their scale. While some scoring decisions are consistent with previous literature, such as the overwhelming tendency for female names to end in a schwa (which receives a score of +2 for the final phoneme section), it remains unclear why, for example, the authors decided to assign a numerical value of only -1 to the monosyllabic names, which Slater and Feinman (1985) indicate is a very male phonological feature.

[11] Such an example is *Robin*, which was originally a diminutive of *Robert* but also came to be used as a girl's name due to a nineteenth century trend of naming daughters after birds (Lieberson et al. 2000:1271).

The PGS also contains several questionable phonological errors, most notably the authors' conflation of fricatives and affricates and their treatment of diphthongs as a single phoneme (problems which could be ameliorated somewhat if the authors had mentioned the logic behind these choices). Also, as discussed in the footnotes to section 1.2, a great deal of redundant information is included in the PGS, and it is unclear if Barry and Harper understand that these statements can be only observations and not requirements of the scoring system. Some of these problems, which undermine the authors' credibility, may result from the fact that the PGS was published in *Sex Roles*, which, though peer-reviewed, is not a journal of linguistics. As a result the authors did not use the IPA for phonemic representations, creating some confusion as to exactly what sounds they were referring to throughout the article.

Though PGS scores in Barry and Harper (1995) significantly correlate with the gender of the names being tested, the scale does not offer the same kinds of insights as a connectionist model. Because the scale codes for a very limited number of phonological features in isolation (stress and final phoneme), it can never tell us anything about other possible cues to gender. Furthermore, having only nine possible total scores for each name greatly diminishes the strength of any within-group comparisons for a data set.

The value of the PGS, then, lies in its pragmatism. As a relatively simple scale to apply the PGS can be extremely useful to researchers and students without access to, or knowledge of, connectionist models. This study evaluates the potential of the PGS for future applications by testing its predictive ability against a new corpus of names. Originally, Barry and Harper (1995) applied the PGS to the 100 most popular men and women's names from 1960 and 1990. The current study applies the PGS to the 100 most phonologically typical men and women's names from Cassidy et al. (1999).

Methods

In their 1999 study, Cassidy et al. included in the appendix a list of men and women's names that, when submitted to the connectionist model, elicited the 50 highest and 50 lowest activation scores for their gender. The names that produced the highest activation scores – that is, the highest level of confidence in the model – were interpreted as the most phonologically typical for their gender. Cassidy et. al inadvertently repeated one of the female names on their list, and as a result reported 49 total female names and 50 total male names. These names became the input for a new test of the PGS; the names were phonemically transcribed, and the scoring system, reproduced in section 1.2, was applied to each name to produce a PGS score.[12]

Results

The PGS correctly predicted the gender of 94% of the male names and 82% of the female names. It gave scores of 0 to the remainder of the female names (18%) and 4% of the male names, as well as giving a score of +1 to *Christopher*, which was also an outlier in Barry and Harper (1995). Averaged together by gender, the PGS score was negative for male names ($M = -2.64$, $\sigma = 1.13$) and positive for female names ($M = 2.32$, $\sigma = 1.43$). Statistical analysis was performed using SISA (Simple Interactive Statistical Analysis), an online program developed by a former professor at the University of Edinburgh (http://home.clara.net/sisa/). The results wavered on the cusp of statistical significance ($F = 1.6$, $p = .05$).

Conclusions

[12] As discussed in section 1.2, the PGS erroneously evaluates diphthongs as a single phoneme (or at least, if the authors had a argument for doing so, they do not explain it). As there is not space here enough to address phonological theories of vowels and vowel sounds, an evaluation of the status of diphthongs in English with respect to the issue of gender in names will not be attempted. Instead, for the sake of consistency in testing, diphthongs were treated as a single phoneme when transcribing the names from Cassidy et al. (1999), and, in section 2.2., the names from Lieberson et al. (2000).

The PGS predicted the gender of the phonologically typical names with greater accuracy than it did for the popular names used in Barry and Harper (1995). The depth of the errors committed by the scale were less egregious as well; there was only one outlier, while the rest of the misclassifications resulted from assigning sex-typed names a neutral score. On average, phonologically typical male and female names respectively produced greater negative and positive PGS scores than the popular names in Barry and Harper (1985). Although the results were not conclusive, possibly due to sample size, the greater accuracy of the scale and the larger scores of the phonologically typical names lend support to the claim that the PGS correctly weighs the most telling phonological cues to gender.

2.2 THE PHONETIC GENDER SCALE AND POPULAR UNISEX NAMES

This study repeats the methodology of section 2.1, but instead of drawing from a sample of phonologically typical English names, it uses the PGS to analyze popular English unisex names as identified by Lieberson et. al (2000). The PGS scale has never been applied specifically to androgynous names – nor, perhaps, was it designed to. There are two phonological features to which Barry and Harper assign a score of 0: a disyllabic name with fewer than six phonemes and primary initial stress, and a name that ends in a sonorant consonant. This does not necessarily imply that the authors consider those traits non-sex-typed. Instead, the 0 score is given to phonological patterns that occur at relatively equal rates in both male and female names. But if a very positive score on the PGS predicts a female name and a very negative score predicts a male name, shouldn't a score of 0 should, theoretically, predict a unisex or sex-ambiguous name? This study evaluates how PGS will treat popular unisex names.

Methods

Lieberson et al. (2000) set forth the following criteria for identifying popular unisex names in their sample: a name had to appear in the top 200 names for boys *and* for girls in New York state at some point between the years 1916 and 1985, and 1995 – though not necessarily in the same year (this, in fact, rarely happened). Of the names listed on the almost eleven million birth certificates in their sample, only 45 met these requirements. These names were phonemically transcribed, and the scoring system discussed in section 1.2 applied to each name to produce a PGS score.

Results

The PGS classified 56% of the unisex names as female and 29% as male. Only 15% of the names received a score of 0. To say that the PGS made incorrect predictions, however, is not exactly useful; it was fairly obvious even before this evaluation that the scale was not designed to accommodate unisex names. The results only make that fact clearer; on average the unisex names taken from Lieberson et al. (2000) received a slightly positive PGS score ($M = .31$, $\sigma = 1.20$), but the wild variance in the scores of each individual name cancelled out any meaningful conclusions we might draw from this number. When compared with both the male and female names from the previous study, no significant differences were found between the groups (using SISA, when compared with the male PGS scores, $F = .70$, $p = .88$; when compared with the female PGS scores, $F = 1.13$, $p = .33$).

Conclusions

Barry and Harper (1995) never claimed that the PGS would be appropriate for unisex names, although it seems like a natural extension of their logic. That the PGS classified a plurality of popular unisex names as female, however, is not necessarily a "mistake." Indeed, given the success of the scale in predicting the gender of phonologically typical names, these

numbers suggest more about the features of unisex names than they do about the faults of the PGS. Recall the linguistic argument for the feminization of names made in Cassidy et al. (1999); structural similarities to female name phonology may encourage lexical shift from male to unisex and from unisex to female names. Thus it is not surprising that popular unisex names from Lieberson et al. (2000), some of which may have originally been male names, should display more typically female phonological features.

Just as it is clear from this study that unisex names do not always elicit a score of 0 on the PGS, a score of 0 on the PGS does not necessarily predict a unisex name. More often, it classifies a name that is simply less sex-typed phonologically, either because it has distinctive features of both male and female names (such as *Sandra*, which contains primary initial stress but ends with a schwa) or because it contains features that are equally distributed between men and women's names. Barry and Harper (1995) describe such features in the PGS scoring system, but it is unclear what data they are drawing from to make their claims. What would these less sex-typed names look like? Would they be truly gender ambiguous? These questions form the basis for my final study.

2.3 USING THE PHONETIC GENDER SCORE TO GENERATE UNISEX NAMES

As demonstrated in section 2.1, the PGS is highly sensitive to the sex of referent for phonologically typical male and female names. One application of the PGS that has not been yet explored in the literature, however, is using the weighted elements of the scale to construct novel but phonologically purposeful names. This study uses the PGS to generate pseudonames specifically designed to be less sex-typed, and then presents the names to native English speakers for classification.

The idea of a "typical unconventional name," of course, is an oxymoron – unconventional names, which include those that are less sex-typed, are by definition supposed to exist outside of established linguistic or social practices. As we have seen both in Cassidy et al. (1999) and in section 2.2 above, however, even unconventional names have some features in common. It may be that we as speakers seek out these similarities as cognitive strategies, recognizing visual, social, and linguistic patterns as a way to identify and sort categories as constantly shifting as gender.

I predict that, due to an androcentrism present even in naming, speakers will classify sex-ambiguous pseudonames as feminine only because they do not reflect male-identified phonological patterns. Such behavior would support Barry and Harper's (1982, 1993) analysis of the evolution of androgynous names, as well as providing a linguistic explanation for the instability of androgynous names described in Lieberson et al. (2000). These results would also offer further evidence that name phonology plays a significant role in the rapid feminization of sex-ambiguous names, suggested by Cassidy et. al (1999).

Methods

As discussed in section 2.2, a name scored on the PGS can receive a final score of zero in two ways. It can receive a null score for both the stress and final phoneme portions of the scale (such as *Devin*), or it can receive opposite values on each portion of the scale which, when added together, cancel each other out (such as *Sandra*, cited above). The second method will not be considered here. Instead, in order to create the least sex-typed names possible, this study focuses only on the phonological features for which Barry and Harper (1995) claim equal distribution in both male and female names.

For the first portion of the PGS scale, which applies to stress, a name will receive a score of 0 only if it is bi-syllabic, contains fewer than six phonemes (where diphthongs are analyzed as a single phoneme) and places stress on the first syllable. For the second part of the scale, which applies to final phoneme, a name will receive a score of zero only if it ends in one of the following sonorants: [m], [n], [ŋ], [□], or [l].

In order to create a template for sex-ambiguous pseudonames that would fit the criteria described in Barry and Harper (1995), I started by listing all the possible syllabic structures the pseudoname could have, using the following logic:

The pseudoname had to contain less than six phonemes. Because men's names tend to have fewer phonemes (Slater & Feinman 1985; Barry & Harper 1995) I did not want to use a template with an absolute minimum number, and decided instead that that every pseudoname would contain exactly five phonemes, fulfilling the constraint without introducing other possible structural cues to gender into the name.

Knowing the name would have exactly five phonemes, a number of possible syllable structures presented themselves. The name must be bi-syllabic, and the last syllable must be closed (because it will be a sonorant consonant). Within those constraints a number of variations can occur:

(1) V.CVCC

(2) V.CCVC

(3) VC.CVC

(4) CV.CVC

(5) CVVCC

(6) CCVVC

While the syllabifications in (1) – (4) are given – and, indeed, will follow from general phonological principles, we run into a problem with (5) and (6), both of which contain a sequence of vowels. Typically, when two words or morphemes ending in a vowel are concatenated, a glide will arise between them, causing one of the vowels to diphthongize.[13] There do exist English words, however, that one could argue contain two distinct vowel sounds without any intervocalic glide; consider *cawing* or *oil*, for instance. These structures are so rare, however, and so scarce in name phonology, that it seems appropriate to exclude them from the possible templates of pseudonames. This leaves us with the templates in (1) – (4), to which we can add appropriate vowels and consonants.

Pseudonames were produced using the random integer program at http://www.random.org, an externally reviewed true random number generator hosted by Trinity College, Dublin. To generate the names, each sound in the phoneme inventory of English (as described in Ladefoged 2000) was numbered consecutively 1-34. Vowels were assigned the values 1-12 and consonants the values 13-34. The sonorant consonants [m], [n], [ŋ], [□], and [l], specifically, received the values 13-17. The random integer generator allows the user to choose the range of integers from which it will select numbers, so when a random vowel was needed, such as the first phoneme in (1), the system was asked to generate a value between 1 and 12; when a consonant was needed, such as the third phoneme in (3), the system was asked to generate a value between 13 and 34; and when one of the five sonorant consonants was needed to close the name, as was the case in all the templates, the system was asked to generate a value between 13 and 17. Every random integer was matched to its corresponding phoneme, and the result formed the basis of a novel pseudoname.

[13] At least, this is how most diphthongs are treated in Chomsky and Halle (1968). Lass (1984) argues they should be analyzed as vowel clusters.

In the case that random phoneme selection violated English phonological rules (producing the cluster [ŋk], for example, in the onset of the second syllable in (2)), or compromised the structure of the pseudoname (generating the same consonant twice in a row in (2) or (3), which, because English does not have double or long phonemes, would reduce to only one phoneme) the generator was asked to randomly select again. This process was repeated until an acceptable combination was produced.

A trial run generating ten pseudonames for each template was conducted for the purposes of troubleshooting. A number of problems were immediately identified in the templates (1) – (3). First, and perhaps most importantly, for all our talk of name phonology the pseudonames produced in these templates did not "sound" like names. Although they were phonologically possible in English, the pseudonames sounded completely foreign in a way I feared might tamper with the results of the experiment, which attempts to gauge how speakers classify novel names, not novel sounds (which is that pseudonames like [iz.kul] or [□w.tuŋ] amounted to). Second, it was exceedingly difficult to randomly generate acceptable consonant clusters in (2); it seemed more worthwhile to instead subsume the syllable structure of (2) under that of (3). The three templates also all began with vowels, which is a vast overrepresentation of vowel-initial name in English; Slater and Feinman (1985) noted that in their sample of 489 English names, less than 5% began with a vowel. For these reasons it was decided that (1) – (3) would be excluded from the experiment design, which left (4) as the most acceptable template for the pseudonames. The template described by (4), incidentally, generated the most "name-like" names in the trial run (such as [fi.wæl] and [ta.□æl]), and avoided the headache of producing permissible consonant clusters.[14]

[14] A tendency to avoid consonant clusters is fact common to most of the world's languages.

Evaluating the experiment design again, I realized that it would be helpful to put further constraints on the pseudonames to make them as sex-ambiguous as possible. While the PGS incorporates the most widely cited phonological differences between men and women's names, there remain many features that the scale does not take into account, such as those brought to light by Cassidy et al.'s (1999) connectionist model. Names with initial consonant clusters, containing [e] or [□] internally, or which included [e□] in the first syllable of name produced high male activation scores, suggesting that these features may be cues to gender. The syllabic structure of the template prohibits word initial consonants clusters, as well as including [e□] in the first syllable of name. I decided, however, to also remove the sounds [e] and [□] as possible vowels for the pseudonames in order to avoid any possible cue contamination. Excluding these two vowels lowered the phoneme inventory by two, and the assignment of numbers to phonemes, as well as the different ranges for the random integer generator, were adjusted accordingly.

15 pseudonames were generated from the template in (4), two of which – [si.tən] and [gæ.jul] – were replaced due to the possibility of priming for the names *Seaton* and *Gail*, respectively. The 15 final pseudonames were recorded along with the 15 most popular boys' and girls' names from 1987 (taken from the Social Security Administration's "Popular Baby Names" website, www.ssa.gov/OACT/babynames). These names, taken from 1987 in order to be familiar to a college-age population born in the mid-1980s (the anticipated participant pool), were to serve as a distracter task for the study (see discussion below). Each name was assigned a number between 1 and 45, which the random integer generator then ordered in a list. The resultant random sequence of names was recorded by two native English speakers, one male and one female, who alternated naming each item. The speakers were instructed to place initial stress on

all the pseudonames and were given ample time to practice their pronunciation before recording took place.

15 male and 15 female undergraduates (mean age = 20.9 years), all native speakers of English, participated in the study (N=30). All subjects were compensated for their participation. The students were given a questionnaire and told they would hear a series of names, some of which would be familiar and some of which would not. They were to indicate if they thought the name belonged to a boy or a girl by marking the appropriate box on their questionnaire (see appendix). Participants heard the names twice; on the first trial they made their judgments, and on the second trial they were given the option of indicating which choices they were unsure about by circling their first answer. They were not allowed to change their initial answers, however. The pace of the recording is brisk; only a few seconds lapse between each name in order to solicit a fast, instinctive response from the subjects. In all but one instance the pace of the recording was not a problem for the participants; one male subject hesitated too long on one of the pseudonames and missed the opportunity to mark his choice for that name on the questionnaire.

Results

For the purposes of statistical analysis, participant responses were converted into numerical values. Gender classifications for each name were represented by one of two values; if a subject assigned male gender to a name it received a value of 0, while a name that was assigned female gender was given a value of 1. With 30 participants, then, the overall gender assignment for each name was represented by the average of those 30 values. An average closer to 0 represents a consensus that it is a more of male name, while an average closer to 1 represents more of female name (as judged by the subjects). There was complete consensus on the genders

the familiar names used in the distracter task. Mean gender assignments (MGAs) for each of the 15 pseudonames are shown in Table 3; gender assignments for the pseudonames taken as a whole (449 trials) are shown in Table 4.

	Mean gender assignment		
Pseudonames	Male subjects (N=15)	Female subjects (N=15)	Total subjects (N=30)
[□wæ.n□l]	.13	.20	.17
[□ki.vul]	.31	.13	.23
[□g□.pəŋ]	.50	.07	.30
[□l□.□□l]	.38	.20	.30
[□ku.g□n]	.38	.20	.30
[□p□.vəm]	.38	.27	.30
[□n□.fəm]	.31	.33	.33
[□θ□.jul]	.53	.27	.38
[□z□.vəm]	.31	.47	.40
[□vo.sæŋ]	.50	.40	.43
[□θu.fæm]	.56	.40	.47
[□s□.w□l]	.38	.60	.50
[□z□.luŋ]	.63	.53	.57
[□ti.f□ŋ]	.69	.60	.63
[□p□.zæ□]	.69	.73	.70

Table 3. Mean gender assignments for individual pseudonames (male = 0, female =1).

	Mean gender assignment
Male subjects (N = 224 trials)	.47
Female subjects (N = 225 trials)	.36
Total subjects (N = 449 trials)	.40

Table 4. Mean gender assignments for pseudonames overall (male = 0, female =1).

Using SISA, a T-test was attempted to compare the observed mean individual and overall gender assignments with an expected mean of .50 (the null hypothesis). SISA was unable to produce a p-value for the data, however, which prevents us from evaluating its statistical significance. We can, however, note some suggestive trends.

Overall, participants inferred maleness from the pseudonames (MGA = .40), and classified the names as male 59% of time. Though the names were judged as "more" male by women (MGA = .36) than by men (MGA = .47), both groups reached near-unanimous consensus on which names were male and which were female; they differed only in the classification of 3 pseudonames: [‘θ□.jul], [‘θu.fæm], and [‘s□.w□l]. Except in the case of [‘s□.w□l], male subjects inferred female gender from these pseudonames, while female subjects thought they were male. There were also three cases in which the MGA of a pseudoname was perfectly neutral; [‘vo.sæŋ] and [‘g□.pəŋ] received MGAs of .50 from the men, and [□s□.w□l] was produced a MGA of .50 overall, which might make it the least sex-typed name in the study. Without an analysis of the variance in these scores, however, it is impossible to know if [□s□.w□l] is truly any less sex-typed than, say, [□z□.vəm] (MGA = .40), or if the overall inference of maleness is truly meaningful.

Female gender was inferred by both men and women from only three pseudonames: [‘z□.luŋ], [‘ti.f□ŋ], and[‘p□.zæ□]. [‘p□.zæ□] was judged as "most" female overall (MGA =

.70), as well as within each group, and was the only name in the set to end in [□]. There was no obvious correlation, however, between any name's phonological structure and its MGA (i.e., the study unearthed no new phonological cues to gender).

No analysis was conducted on which of the that elicited uncertainty on the part of the subjects, or the frequency of such doubt. Anecdotally I can say that a large number of participants circled all the pseudonames when listening to the recording a second time. The option to indicate uncertainty in the experiment, however, functioned mainly to put participants at ease in making what was often a difficult choice, and is not the focus of study here.

Conclusions

Though we can speculate on what, if anything, this study may indicate, without a measure of the kind of numbers that would be meaningful we must temper our conclusions. While the data does not appear to support my initial hypothesis, it does not completely disprove it. If the overall trend to infer maleness from the pseudonames in the study is in fact significant, however, two interpretations follow, depending on one's evaluation of the PGS and Barry and Harper (1995):

1) The phonological features Barry and Harper (1995) claim are equally distributed between men and women's names are in fact cues to gender, as demonstrated by the overwhelming classification of names with these features as male.
2) The phonological features Barry and Harper (1995) claim are equally distributed between men and women's names are truly gender neutral, so the consensus that the pseudonames signal male gender must come from another source.

The second (hypothetical) case may well be another consequence of androcentrism; when presented with truly gender-ambiguous names speakers, unable to comprehend a category

of personhood free from gender, immediately project male gender onto the names, because maleness is what we have come to take as the norm in any situation where gender is unknown. Consider other situations in which gender is masked, often by obscuring one's given name: forms of address such as *Dr.* or *Prof.*, authors who use their initials only (*J.K. Rowling*), the practice, common on sports teams, to refer to someone only by their surname ("Hey Fredrickson!"), etc. Anecdotally, at least, I would argue that speakers tend to infer male gender in the majority of these situations.

These are questions for future research, however (discussed in the following section). The most helpful discussion we can have on the current study is to catalogue its faults. Regardless of the study's significance, the following concerns must be noted:

The design of the experiment is itself somewhat resistant to statistical analysis. Participants assigned a pseudoname to one of two discrete gender categories, as opposed to using a more continuous measure such as a 7-point masculinity scale (as in Whissell 2001). Using a scale may have produced more sophisticated, decipherable results; when only two options are used, factors such as variance become less valuable indicators of significance. The technique used in the experiment, however, more closely represented real world conditions.

That the pseudonames seem to signal maleness could, in part, result from the problem of name priming. Although I screened the pseudonames for any associations they might have with other names, and even ended up replacing 2 names that seemed too familiar to English speakers, several subjects in the experiment later commented that the name ['wæ.n□l] sounded like *Ronald* and ['l□.□□l] like *Herschel*, which may have affected their impression of the name. Apart from these more overt associations, even, it is difficult to control for name priming; subjects have been

exposed to all kinds of names and even a small phonological feature I may not recognized could remind them of a conventionally sex-typed name.

Lastly, related to the problem of name priming, was a tendency by subjects to assume that the novel-sounding pseudonames were in fact names from another language. After they had completed the experiment, some participants inquired why I had included Arabic names in my sample, while others thought the pseudonames were African or Vietnamese. Although the all the pseudonames were permissible in English phonology, it does not follow that they were "believable," per se, as actual English names. English name phonology may have more complex requirements for admission. Thus, despite efforts to the contrary, this experiment may have been more of a study of novel sounds than a study of novel names. When replicating the study, care should be taken to carefully screen the pseudonames for any other naming associations, and stress to the participants that the names they will hear are all "English" names.

3.1 DIRECTIONS FOR FUTURE RESEARCH

What are the effects of unisex names? Though this paper has dealt extensively with the phonological structure and historical trends of gender-ambiguous names, it can only raise a hypothesis as to how such names operate in a socio-cultural context. Evidence presented in this paper suggests that the most significant work a unisex name can do is mask the gender of its referent, which makes such names risky for men, who have much to gain by being recognized as male, and attractive for women, who (as well as men) often face sex role stereotyping at the very level of their name (Duffy & Ridinger 1981). Obscuring the gender of a name seems to lead to masculine associations by default; it would be useful to investigate in what situations of gender-masking these inferences are made. In Goldberg's famous 1968 study (cited in Duffy & Ridinger

1981), books by female authors were rated more favorably when the author's name was changed to that of a man. What would happen if the gender of the author were merely obscured, as opposed to radically changed? Would the books still be rated more favorably? There are a number of studies that could be undertaken to explore the effects of masked gender in contexts such as academia (are female academics more likely to mask their gender in publications by using titles or initials?) or the workplace (is a woman more likely to be hired if she uses only her initials on her resume or job application?). These studies could also be repeated using unisex names to see how the masking effect changes.

In addition to studying the effects of unisex names, there is much work to be done on how speakers respond to an absence – or at least a lessening – of sex-typed characteristics in names. One such response may be to artificially create patterns that signal gender for those names; a large number of unisex names use different spelling conventions depending on whom the name is to apply to. Though names such as *Joe* and *Jo* are homonymic, for example, they are clearly sex-typed in their spellings. Speakers, I suspect, are either unable or unwilling to conceive of names outside of the gender binary and, if not given phonological or conventional cues by which to infer the gender of a name, will employ sex-typing in other systems, such as spelling. The interval at which these reactions take place may inform us of the degree to which speakers desire clearly sex-typed names. Working from primary sources such as baby naming books, future studies could attempt to identify the time lapse between the year when a unisex name is accepted (first listed) as unisex, and the year in which different spellings for male and female forms of name are introduced.

Much can also be done with the pseudonames generated in the study in section 2.3. To explore the desirability of less sex-typed names for men and women, a useful application of these

names could involve polling speakers on whether the pseudonames are "better" girls' names or boys' names. I hypothesize that the names would be rated as better names for girls, even though speakers seemed to infer maleness from them in the first study – in fact, this inference may be considered advantageous. Despite their possible cues to gender, I suspect that the names are not sex-typed enough to be desirable boys' names.

In order to strengthen any claims we want to make about naming and gender at the theoretical level, more work must also be done on naming in a cross-cultural perspective, such as Alford's (1988) study of personal naming practices. Though the majority of the groups in his sample sex-type their names, 15% do not. How does this practice affect their gender system? To gain a non-oral viewpoint, studies of name signs in the deaf community, which are not thought to signal gender, may also be warranted.

Phonological cues to meaning of any kind have been notoriously understudied (Kelly 1992:349), possibly due to their associations with sound symbolism. While this paper outlines the more important works on phonological cues to gender in English, few studies have been conducted on cues to gender in the naming systems of other languages. Such cross-linguistic comparisons are essential for the development of a coherent theory of naming.

4.0 FINAL THOUGHTS: ON GENDER AND SENSELESSNESS

Much ink has been spilled over the difference between proper nouns and common nouns (see Zelinsky 2002 for an overview); how can names have sense – that is, the connotative value of most nouns – when they lack unique applicability? As Linsky (1963, cited in Coates 2006:362) points out, "Proper names are usually (rather) common ones." The relatively small concentration of boys' names in the United States is a prime example of this problem; if there are

roughly 5 million people named *John* living in the United States (http://www.howmanyofme.com), it is obvious that the proper name *John* is not made "proper" by its ability to denote uniquely. As Coates (2006) points out, proper nouns can denote things or people contextually – but the link with their referent is arbitrary. For this reason, Coates argues, proper names are pure referential expressions and as such have no sense. This does not mean they will be interpreted as meaningless, however; the quality of being a proper noun (what Coates calls "properhood") is, he concludes, entirely pragmatic.

The category of gender poses a serious threat to Coates's argument, however; sex-typed names appear to have consequences, which means they may have sense: they connote the sex of their referent. Coates attempts to dismiss these inferences as "conventional expectations" (2006:364). While convention, as we know, plays a large role in establishing the gender of a name, we have also seen evidence in this paper that name phonology can be highly influential, and is (consciously or unconsciously) manipulated by speakers to affect how they will be perceived by others. Names may be highly pragmatic, but they do contain some (structural) sense. Curiously enough, the ideal unisex name – one that signals absolutely nothing about the sex of its referent – seems to fit better into Coates' model of what names do (that is, nothing).

What does it mean for a name to be meaningful? In many ways, as Coates argues, it is only the effect of a name that matters – it can signal gender, as we have seen in this paper, as well as race and class, which can work to the advantage of those with privileged names. The concept of gender is similarly pragmatic; only its unjust effects, wrought by a culture of sexual difference, make it visible, worth studying, and worth changing.

REFERENCES

Acker, Joan. 2004. Hierarchies, jobs, bodies: A theory of gendered organizations. *The gendered society reader*. ed. by Michael S. Kimmel, with Amy Aronson. New York: Oxford University Press.

Alford, Richard D. 1988. *Naming and identity: A cross-cultural study of personal naming practices*. New Haven: HRAF Press.

Alspach, E.M. 1917. On the psychological response to unknown proper names. *The American Journal of Psychology* 28. 436-443.

Bakken, Kristin. 2002. Onomastics and linguistics. *Onoma* 37. 21-46.

Barry, Herbert B., and Aylene S. Harper. 1982. Evolution of unisex names. *American Name Society* 30. 15-22.

Barry, Herbert B., and Aylene S. Harper. 1993. Feminization of unisex names from 1960 to 1990. *Names* 41. 228-238.

Barry, Herbert B., and Aylene S. Harper. 1994. Sex differences in linguistic origins of personal names. *Names new and old*, ed. by E. Wallace McMullen, 281-300. Madison, NJ: Penny Press.

Barry, Herbert B., and Aylene S. Harper. 1995. Increased choice of female phonetic attributes in first names. *Sex Roles* 32. 809-819.

Battig, W.F., & Montague, W.E. (1969). Category norms of verbal items in 56 categories: a replication and extension of the Connecticut category norms. *Journal of Experimental Psychology* 80. 1-46.

BBC International News. 2003. US babies get global brand names. http://news.bbc.co.uk/2/hi/americas/3268161.stm

Bem, Sandra L. 1993. *The lenses of gender*. New Haven: Yale University Press.

Bourdieu, Pierre. 1984. *Distinction: A social critique on the judgment of taste*. trans. Richard Nice. Cambridge, MA: Harvard University Press.

Butler, Judith. 1990. *Gender trouble: Feminism and the subversion of identity*. New York: Rutlidge.

Cassidy, Kimberly W.; Michael H. Kelly; and Lee'at J. Sharoni. 1999. Inferring gender from name phonology. *Journal of Experimental Psychology: General* 128. 362-381.

Chomsky, Noam, and Morris Halle. 1968. *The sound pattern of English*. New York: Harper and Row.

Coates, Richard. 2006. Properhood. *Language* 82. 356-382.

Cutler, Anne; James McQueen; and Ken Robinson. 1990. Elizabeth and John: sound patterns of men's and women's names. *Journal of Linguistics* 26. 471-482.

Dreger, Alice D. 1998. *Hermaphrodites and the medical invention of sex*. Cambridge, MA: Harvard University Press.

Duffy, James C., and Bruce Ridinger. 1981. Stereotyped connotations of masculine and feminine names. *Sex Roles* 7. 25-33.

Fausto-Sterling, Anne. 2000. *Sexing the body: Gender politics and the construction of sexuality*. New York: Basic Books.

Foucault, Michel. 1979. *Discipline and punish: The birth of the prison*. trans. by Alan Sheridan. New York: Vintage Books.

Fryer, Roland G. Jr., and Steven D. 2004. The causes and consequences of distinctly black names. *The Quarterly Journal of Economics* 3. 767-805.
Haahr, Maads. 1998. True random number service. http://www.random.org.
Hinton, Leanne; Johanna Nichols; and John J. Ohala. 1994. *Sound symbolism*. New York: Cambridge University Press.
Hough, Carole. 2000. Towards an explanation of phonetic differentiation in masculine and feminine personal names. *Journal of Linguistics* 36. 1-11.
Ingraham, Holly. 1996. *People's names: A cross-cultural reference guide to the proper use of over 40,000 personal and familial names in over 100 cultures*. Jefferson, NC: McFarlan.
Jackson, Peter A. 1997. Kathoey >< gay >< man: The historical emergence of gay male identity in Thailand. *Sites of desire, economies of pleasure: sexualities in Asia and the Pacific*. ed. by Lenore Manderson and Margaret Jolly, 166-190. Chicago: University of Chicago Press.
Jacobs, Sue-Ellen; Wesley Thomas; and Sabine Lang, eds. 1997. *Two-spirit people: Native American gender identity, sexuality, and spirituality*. Urbana: University of Illinois Press.
Kelly, Michael H. 1992. Using sound to solve syntactic problems: the role of phonology in grammatical category assignments. *Psychological Review* 99. 349-364.
Ladefoged, Peter. 2000. *A course in phonetics*. Boston: Thomas Wadsworth.
Lass, Roger. 1984. *Phonology: an introduction to basic concepts*. Cambridge: Cambridge University Press.
Lieberson, Stanley L., and Eleanor O. Bell. 1992. Children's first names: an empirical study of social taste. *The American Journal of Sociology* 98. 511-554.
Lieberson, Stanley L.; Susan Dumais; and Shyon Bauman. 2000. The instability of androgynous names. *The American Journal of Sociology* 105. 1249-1287.
Lieberson, Stanley L., and Kelly Mikelson. 1995. Distinctive African-American names: An experimental, historical, and linguistic analysis of innovation. *American Sociological Review* 60. 928-946.
Mawer, Allen, and F.M. Stenton, with F.T.S. Houghton. 1927. *The place-names of Worcestershire*. Cambridge, UK: Cambridge University Press.
Nanda, Serena. 1990. *Neither man nor woman: the Hijras of India*. Belmont, CA: Wadsworth.
National Institutes of Health. 2006. Klinefelter syndrome. http://www.nichd.nih.gov/health/topics/klinefelter_syndrome.cfm
Nemer, Julie F. 1987. Phonological stereotypes and names in Temne. *Language in Society* 16. 341-352.
Nuckolls, Janis B. 1999. The case for sound symbolism. *Annual Review of Anthropology* 28. 225-252.
Ohala, John J. 1994. The frequency code underlies the sound-symbolic use of voice. *Sound symbolism*. ed. by Leanne Hinton, Johanna Nichols and John J. Ohala, 325-347. New York: Cambridge University Press.
Pulgram, Ernst. 1954. *Theory of names*. Berkeley: American Name Society.
Rossi, Alice S. 1965. Naming children in middle-class families. *American Sociological Review* 30. 499-513.
Rialland, Annie, and Mamdou Badjime. 1989. A reanalysis of Bambara tones: from tones on the name to the general organization of the system. *Studies in African Linguistics* 20. 1-28.
Sapir, Edward. 1929. A study in phonetic symbolism. *Journal of Experimental Psychology* 12. 225-239.

de Saussure, Ferdinand. 1959. *Course in general linguistics*. New York: Philosophical Library.
Sedley, David, trans. 2003. *Plato's* Cratylus. Cambridge, UK: Cambridge University Press.
Slater, Anne Saxon, and Saul Feinman. 1985. Gender and the phonology of North American first names. *Sex Roles* 13. 429-440.
Tournier, Paul. 1975. *The naming of persons*. New York: Harper and Row.
United States Social Security Administration. 2006. Popular baby names. http://www.ssa.gov/OACT/babynames
Uitenbroek, Daan G. 1997. SISA. http://home.clara.net/sisa.
Whissell, Cynthia. 2001. Cues to referent gender in randomly constructed names. *Perceptual and Motor Skills* 93. 856-858.
Zelinksy, Wilbur. 2002. Slouching toward a theory of names: A tentative taxonomic fix. *Names* 50. 243-62.

APPENDIX

The following is the questionnaire used in the study in section 2.3

You will hear the list of names twice. The first time you hear the names, mark only whether you think the name you hear is the name of a boy or a girl. The second time you hear the names, you may indicate any answers you are unsure about by circling the number of the name, but do not change your answers.

1. ☐ Boy ☐ Girl
2. ☐ Boy ☐ Girl
3. ☐ Boy ☐ Girl
4. ☐ Boy ☐ Girl
5. ☐ Boy ☐ Girl
6. ☐ Boy ☐ Girl
7. ☐ Boy ☐ Girl
8. ☐ Boy ☐ Girl
9. ☐ Boy ☐ Girl
10. ☐ Boy ☐ Girl
11. ☐ Boy ☐ Girl
12. ☐ Boy ☐ Girl
13. ☐ Boy ☐ Girl
14. ☐ Boy ☐ Girl
15. ☐ Boy ☐ Girl
16. ☐ Boy ☐ Girl
17. ☐ Boy ☐ Girl
18. ☐ Boy ☐ Girl
19. ☐ Boy ☐ Girl
20. ☐ Boy ☐ Girl
21. ☐ Boy ☐ Girl
22. ☐ Boy ☐ Girl
23. ☐ Boy ☐ Girl
24. ☐ Boy ☐ Girl
25. ☐ Boy ☐ Girl
26. ☐ Boy ☐ Girl
27. ☐ Boy ☐ Girl
28. ☐ Boy ☐ Girl
29. ☐ Boy ☐ Girl
30. ☐ Boy ☐ Girl
31. ☐ Boy ☐ Girl
32. ☐ Boy ☐ Girl
33. ☐ Boy ☐ Girl
34. ☐ Boy ☐ Girl
35. ☐ Boy ☐ Girl
36. ☐ Boy ☐ Girl
37. ☐ Boy ☐ Girl
38. ☐ Boy ☐ Girl
39. ☐ Boy ☐ Girl
40. ☐ Boy ☐ Girl
41. ☐ Boy ☐ Girl
42. ☐ Boy ☐ Girl
43. ☐ Boy ☐ Girl
44. ☐ Boy ☐ Girl
45. ☐ Boy ☐ Girl