# Drug Trade Names:
# A Morpho-Semantic Study
# in Resourcefulness and Perfidy

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## 1. Introduction

Drug trade names are an important object of study because of the health, legal and commercial concerns they represent. For instance, look-alike and sound-alike names of drugs contribute to the burden of medication errors, which are a subset of adverse events in healthcare. These errors of prescription, dispensing and use account for 7000 annual deaths in the US (cf. Kohn et al 2000), and for 25% of litigation claims in general medicine practice in the UK (cf. Department of Health 2000). As might be expected, there is also undocumented and anecdotal evidence. The pharmacist co-author of this paper (C.E.) has been witness to two interesting scenarios involving two drugs, Virex and Virest. In the first, a client returned to a pharmacy to complain that a drug previously sold to him (Virex, for HIV-AIDS) was not having the desired effect. Upon closer examination of the original prescription, it was discovered that Virest (for herpes), not Virex, is what was prescribed and what should have been sold. The second scenario occurs during a follow-up visit to a hospital to which C.E. had introduced a drug (Virest) manufactured by the company he represents. C.E. was given what was intended as cheering news: 'Virex is now being prescribed.' Flabbergasted, C.E. protests: 'No, no, my drug is Virest, not Virex.' Another company and another drug were now undeservedly enjoying the fruits of C.E.'s marketing labour (as sales pharmacist).

Invaluable insight into drug trademarks has come notably through initiatives of the US Food and Drug Administration (FDA). The rationale for this agency's keen interest can be gleaned from the following admission: 'FDA has determined that many of the medication errors reported to the agency result from medical products having proprietary names that look or sound like the names of other medical products. Reducing the potential for medication errors due to proprietary name

confusion is part of FDA's ongoing medical product risk management effort' (cf. Department of Health and Human Services 2003).

At a June 2003 public meeting of the FDA to brainstorm on methods for evaluating the potential for drug name similarities, there were presentations on: the need to carefully think through and plan the phases of a trademark development model (Olmstead 2003); the range of factors that make name confusion possible (Lesar 2003); the need for manufacturers to generate protocol data showing how a proposed drug name avoids confusion with an existing name, and supply same to the FDA when approval is sought (Hassal 2003); the place of handwriting technology in predicting the likelihood of a proposed name being confused with another in written prescriptions (Jaszczak 2003); how phonetic and orthographical strings (subsequence of characters) can be used to assess the similarity and distance of names (Dorr & Kondrak 2003); etc.

In Nigeria, it is rare to find any kind of linguistic research on drug trade names, whether conducted from the medical safety standpoint (a perspective that enjoys prominence in, say, North American literature), or from the equally important ethical-commercial perspective that is particularly dictated by the context of drug management in the country. The overall consequence of this dearth is that knowledge of issues in drug trade names is arguably rudimentary, to the disadvantage of all stakeholders. Drug manufacturers may not be aware of the infringement of their rights by competitors through trade name counterfeiting, or they may not have a robust framework for thinking through trade naming possibilities and for reflecting broadly on the implications of whatever trade names are assigned to drugs. Lawyers who have to prosecute trademark cases may not have access to useful perspectives for their cases. On their part, regulatory authorities may employ rather rudimentary criteria for scrutinizing trade name licence applications for drugs to be marketed within national borders.

This article seeks to analyse the semantic motivations underlying drug names marketed in Nigeria as well as the morphological processes employed in encoding these motivations. In doing this, our objectives are to find out: a) how exhaustively available naming resources have been utilized, b) how resourceful manufacturers have been in assigning trade names to drugs, c) if and how trade naming contributes to unfair trade practices and to the potential for adverse drug events, d) the challenges which drug naming practices pose to regulatory authorities and the legal framework within which they operate. In order to elaborate on the context within which the study derives its significance, we first describe the environment of drug administration in Nigeria.

## 2. The context of drug administration in Nigeria

There are changes taking place currently in the drug administration environment in Nigeria, thanks to the multi-pronged approach of the country's National Agency for Food and Drug Administration and Control (NAFDAC) under the much decorated Dora Akunyili. Insight into the state of drug administration in the country's very

recent past can be gleaned through the prism of novel initiatives launched by Akunyili's leadership of NAFDAC. However, to be at a turning point, as drug administration in Nigeria currently is, means that there are residues of those practices which have been largely tackled by reforms.

Fake and substandard drugs have been a bane of healthcare in Nigeria. A BBC Two, July 12, 2005 broadcast ('bad medicines') described the quality of drugs sold in Nigeria and the international sources of substandard medicines. It also showed accounts by patients' relatives of drug failures (with often irreversible consequences) caused by what turned out to be fake and substandard drugs. Strikingly, these incidents did not always take place in some corner street patent medicine store but also in University Teaching Hospitals.

NAFDAC has, by the admission of all, made tremendous progress on the road to ridding Nigeria of fake and substandard drugs. In 1989, for instance, 25% of drugs sold in Nigeria were fake and substandard, 25% genuine, and in 50% of cases studied the evidence was inconclusive. A 1990 study similarly showed that 54% of drugs in 'every major pharmacy shop were fake, a figure that had risen to about 80% in the subsequent years.' (cf. NAFDAC 2005). At the end of 2005, it was estimated that over 80% of the drugs marketed in Nigeria were genuine.

Quite a number of factors brought about the situation currently being addressed by NAFDAC. For instance, the combination of a tradition of long-distance road travel would seem to have spawned a drug hawking industry revolving around intestinal motility-inhibiting medicines and closely linked to passenger vehicular movement. Initially, diarrheal drugs were the medicines sold, but over time the range increased. It was common sight to see – at petrol stations where buses and taxis stop over – barely literate vendors, hawking search-light batteries and air-fresheners alongside antibiotics under all unimaginable weather conditions. Thanks to NAFDAC, which has declared this practice illegal and is clamping down on perpetrators, the industry is increasingly becoming less visible and may only now exist underground. Outright success is probably a tall order because deep-rooted practices, bolstered by poverty and low levels of education, make it difficult to enforce appropriate measures. Unlike in a pharmacy or a patent medicine store, the hawker can sell two of the ten tablets in a sachet if that is what the client can afford.

Health in Nigeria is largely financed through out-of-pocket expenses. This factor combines with a myriad of other factors such as the following to create other challenges for drug administration: widespread poverty, poor patient–physician ratios, questionable educational levels of persons manning drug outlets, a tradition of purchase and sale (without prescription) of what are prescription-only-medicines (POMs), and so on. Every so often at patent medicine stores and pharmacies, clients are seen coming in and complaining of a long list of problems, then offering the local currency equivalent of less than a cent, and asking for whatever drug description(s) and quantity thereof can address the catalogue of problems. At once the vendor, who may be barely literate, is pressured into the role of physician-

economist, clearly oblivious of the distinction between POMs and over the counter (OTC) medicines. Here again, NAFDAC is having drug vendors comply with the international practice of selling only on prescription medicines that are so classified. Drug vendors are increasingly wary of selling POMs without prescription as the client could very well be an undercover NAFDAC agent or a security operative. Again, success here is likely to be a tall order because of system linkages. If the physician–population ratio is poor or if access to a physician is difficult for financial, geographical and other reasons, operators of pharmacies will continue to have a steady flow of clients that require POMs but without the prescriptions. Since pharmacies are essentially business outfits, business sense is likely to prevail.

It is indeed this warped business sense that often exploits the low educational levels of the clientele and/or the absence of prescriptions to create a common but unfortunate scenario in pharmacies and other drug sales outlets in Nigeria. A request by a client for drug XA, which turns out to be unavailable in the given pharmacy, is hardly answered in the negative. In the better of two scenarios, the vendor says XB is available, implicating to the client that XA and XB are identical. In a worse case, XB is simply passed off as XA, with no apparent concerns about bioavailability. In the course of writing this article, one of us (BA) went to a pharmacy with a request for Ceporex (a Cephalexin-based antibiotic syrup from GlaxoWellcome). With no explanation whatsoever, the dispensing pharmacist packages Spirodex, a competing product. BA rejects it. An apology is only (sarcastically) offered after BA affirms that a client has the right to the brand of choice for what might be considered psychological reasons, assuming there are no pharmokinetics to worry about.

In sum, the context in which this study is set is one in which drug counterfeiting is or has been a problem. It is an environment in which drugs are requested, not on the basis of (authorized) prescription, but on the recommendation of a neighbour who, for all we know, is barely literate in English and may have mixed up the pronunciation of the drug's English-sounding name. The context is also one in which drugs are sold by all manner of persons with questionable credentials and with scant regard for prescription; even where there is a prescription, the dictates of the bottom-line are such that the client's right of choice is disregarded. In these circumstances, it becomes clear that drug trade naming practices can be a veritable source of concern from the health, commercial and similar standpoints.

## 3. Theoretical framework

A discussion such as this on the name by which something is called is necessarily framed by an outline of concept characteristics and by the word-formation processes that give expression to the decisions taken at the concept characteristics level.

It is often the case that the name of an object will be motivated by some characteristic of that object, in other words, attributes. We interpret Dahlberg's

(1995) account of concept characteristics in terms of a cline, from a high level of abstraction or generalization to a low or zero level. See Figure 1 below.
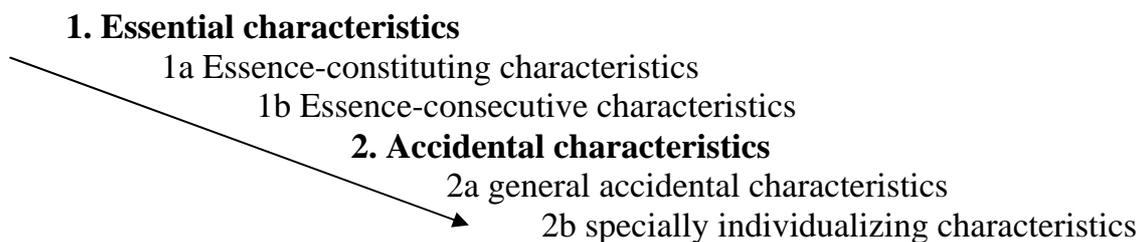
**1. Essential characteristics**
        1a Essence-constituting characteristics
          1b Essence-consecutive characteristics
            **2. Accidental characteristics**
                2a general accidental characteristics
                  2b specially individualizing characteristics

**Figure 1:** Typology of concept characteristics

Following Dahlberg, if we take a human being as referent, an example of…

- 1a would be: to have a living body, to have a soul, to have a divine spirit – these being according to her the necessary and sufficient conditions. (For a drug, this would be a brand attribute like chemical composition or the generic on which it is based);
- 1b would be: (from having a living body) metabolism & reproduction; (from having a soul) feeling; (from having a divine spirit) creativity, free-will power, etc. (For a drug, this would be a brand attribute like, say, therapeutic effect);
- 2a would be: sex (male, female), height (tall, average, short), etc. (For a drug, this would be a brand attribute like the presentation form: tablet, caplet, etc.);
- 2b would be: date of birth, domicile, name of parents, etc. (For a drug, this would be a brand attribute like the name of the manufacturer).

When a decision is taken on what characteristics, brand attributes or motifs to implement in a name, the next issue is that of the word-forming method that will give expression to that decision. Name formation is a peculiar activity in that it does not appear subject to all of the same kinds of constraints or rules for forming general language words. It is intuitively assumed that, with perhaps the exception of compounding, relevant word formation processes would fall into the category of what is severally referred to as oddities, unpredictable formations, and so on. Since in its treatment of these processes the relevant literature (e.g. Francis 1981, Bauer 1983, Mathews 1991) sometimes differs in terminology, classification, level of generalization, perspective, we outline below our operational acceptation for a number of processes relevant to the current context.

1. When two or more words (including names and coinages) combine, or when a word combines with a word-part whose underlying base is despite the shortening still transparent, and the resulting combination is a hyponym of the grammatical head, then we will speak of an **endocentric compound**. Examples: Robert Paracetamol, Moko Chloroquine, Alagbin Plus, Voltaren

SR (the latter two being of course left-headed, whereas the former two are like all typical English language compounds right-headed).

2. When two or more words or transparent word-parts combine, and there is no apparent head within the construction because the real head is actually external and is only metaphorically referred to, we will speak of an **exocentric compound**. Examples: Painax (<pain + axe), Pengo (<pain + go) – in which the words occupying the traditional position of head refer metaphorically to the named medicines.

3. When two or more words (typically proper nouns) combine and no meaningful analysis into modifier and head can be made literally or metaphorically, then we have a **copulative compound**. Example: Alka-Seltzer. (Company mergers often are a source of copulative compounds).

4. When a word is made up of initials and other place holders like numbers, the result is **abbreviation**. Examples: M & B 5, CQP 500.

5. When a word is shortened but its base remains recognizable in the reduction, or when two or more shortened words are combined to form a new one that is semantically recoverable, then we have **clipping**. Examples: Clofenac (< diclofenac), Emzoquine (< clipped forms of Emzor – name of manufacturer – + Chloroquine), Lariam (< malaria).

6. When a word or proper noun combines with an unrecognizable word-part (including initialism), or when two word-parts are combined such that one or both of the parts is not recognizable, or is only recognized after being explained, the process is described as **blending**. Examples: Emprin (<clipped forms of Emzor and Aspirin), Imoceta (<unknown + clipped form of paracetamol).

7. When a previously non-existing word is formed with no motivation of any kind, the result is **word manufacture**. Examples: Propon, Daga, Afrim.

To allow them remain basic or no more complicated than they already are, these operational definitions have not been encumbered with such otherwise necessary specifications as: the nature of the word (orthographic vs. phonetic: recall examples painax and pengo); whether letters of a word are written in their correct sequence or in some inverse or other order (recall example: Lariam < malaria); and so on. The criterion of transparency/recognition which serves to distinguish blending and (a compound form of) clipping is a rather subjective one, depending as it is on the observer. The perspective that will be adopted here is that of the health professional or other persons who, through interest, have gained some familiarity with the drug industry in Nigeria (generics of trade names marketed, notable manufacturers, etc.).

It is within this framework, then, that we will be analysing (in the manner outlined in the next section) the data for this study.

## 3. Materials & Methods

Data required for the study is made up of trade names of drugs, and these names are sourced from the *Emdex Complete Drug Formulary for Nigeria* (2005), a published reference resource based on the World Health Organization (WHO) model formulary. It contains, among others, generic names of drugs, trade names of drugs that are registered in Nigeria, features of these drugs (composition, strength, presentation form, base, etc), the conditions they treat as well as the names of their manufacturers or importers into Nigeria[1].

A total of 209 trade names constitute the corpus for this study. These names are taken from three drug categories: non-opioid analgesics and antipyretics (66 proprietary drugs distributed over 6 generics), nonsteroidal anti-inflammatory drugs (72 proprietary drugs distributed over 11 generics) and antimalarial drugs (71 proprietary drugs distributed over 15 generics). Pain/fever and inflammation (the first two categories) and malaria (third category) are very common conditions for which there is a diversity of generic and proprietary drugs. Only trade names for proprietary formulations are of interest to this study.

In addressing the first objective on how exhaustively available naming resources have been utilized, the motifs or concept characteristics encoded as names in our corpus will be identified as well as the patterns of combination and morphological processes. The identification of motifs may be subjective, but it will be seen to be intersubjectively verifiable. On the basis of the list of motifs, the number of naming options will be determined through a permutation analysis using the following formula:

$$^{n}P_{r} = \frac{n!}{(n-r)!}$$

where
   $P$ = Permutation symbol
   $n$ = No. of available motifs (in this case $n$ =13)
   $n!$ = Factorial $n = n(n-1)(n-2)...1$
   $r$ = No. of motifs in a drug name (in this case $r$ =*1, 2* or *3*)

The number of possibilities (permutations) will show not just how exhaustively naming possibilities have been actually used, but also a sense of the distribution of the actual naming patterns over possibilities. What motivation patterns are over- or underused? The question will also be asked in respect of morphological processes.

In addressing the second objective on the resourcefulness of manufacturers, we draw on the results of a general analysis of the motivations of all trade names and the morphological processes that encode these motivations into names. The specific

data of interest here are those situations where there are several manufacturers producing proprietary versions of the same generic and having trade names reflect this generic without *apparently* infringing on one another's names.

To address the third and fourth objectives on the relationship between, on the one hand, trade naming and, on the other, adverse drug events (associated with prescribing, dispensing and using), fairness and regulation, several kinds of data will be presented, notably data showing a perfidious genericization of trade name parts.

## 3. Results

### 3.1. Distribution of trade names over naming possibilities

Appendices 1 – 8 present data on motivation patterns as well as on the morphological processes encoding instances of these motifs into trade names. With respect to motifs, the appendices show that forty-four possibilities are used. Leaving out instances of the motif referred to as 'stolen' in serial numbers 6, 28, 35, 38, 39, 40, 41 (to which we shall return subsequently), we have thirty-seven motivation patterns.

From the standpoint of the typology of characteristics, the corpus exemplifies the whole range: motif combinations that highlight essence-constituting characteristics like serial no. 18 (generic + base + strength = CQP-500, where CQP=Chloroquine Phosphate), no. 25 (condition + generic = malaquine), no. 42 (effect + condition = antimal); and motif combinations that slight essential characteristics like no. 2 (unknown + fortification = Alagbin Plus),  no. 32 (manufacturer + presentation form = Emcap), no. 33 (manufacturer + strength = M & B 5), no. 36 (attribute + presentation form = toptabs).

Again leaving out the motifs referred to as stolen, we see from appendices 1 – 8 that, essentially, thirteen motifs are implemented, namely: 1) unknown (often we have proper nouns here), 2) generic name, 3) condition (to be treated), 4) manufacturer's name, 5) effect (the therapeutic consequence of drug), 6) attribute (expressive, judgmental description of drug), 7) strength (SR: slow release; mg: milligram), 8) fortification (e.g. extra, plus, both indicating a combination of generics), 9) presentation form (e.g. tablet, capsule, elixir), 10) base (phosphate, sodium, etc.), 11) user group (of the drug, e.g. kids), 12) substance (other composite besides generic), 13) category (the group to which several generics belong, e.g. analgesics, antimalarials). The question now is: just how many naming possibilities can these thirteen motifs generate, assuming a maximum of three motifs per name?

Using the formula for permutation analysis given earlier, if a drug name were to consist of no more than $k$ motifs (where $1 \leq k \leq n$), the number of possibilities (permutations) would be:

$$\sum_{r=1}^{k} {}^{n}P_r = \sum_{r=1}^{k} \frac{n!}{(n-r)!}$$

Therefore, a permutation analysis of the 13 motifs in our corpus, where a drug name consists of no more than 3 motifs, gives rise to the following number of possibilities:

$$\sum_{r=1}^{3} {}^{13}P_r = \sum_{r=1}^{3} \frac{13!}{(13-r)!} = \frac{13!}{12!} + \frac{13!}{11!} + \frac{13!}{10!} = 13 + (13)(12) + (13)(12)(11) = 1885$$

Intuitively, however, certain motif permutations are conceptually or otherwise implausible, even though those examples of trade names that implement essence-irrelevant characteristics tend to suggest that just about any selection is possible. We nonetheless assume that some motifs or motif permutations may not (always) be possible, and that there would be certain constraints to selections/sequences. For instance, the motif 'fortification' is not uniformly available because a given drug's composition needs to have been fortified with some other generic for this motif to be used. Besides, fortification will necessarily occur in the proximity of 'generic'. The motif 'effect' necessarily has to be in the proximity of motif 'condition'. Although it cannot be stated just how many such exceptions there would be[2], it appears, intuitively at least, that the thirty-seven options actually used in the corpus represent a small fraction of the 1885 possibilities. Table 1 below presents a sample of patterns (two and three motifs) that have not at all been attested in our corpus.

| Generic + user group | Presentation form + generic | Generic + base |
|---|---|---|
| Manufacturer + condition + effect | Generic + presentation form | Manufacturer + unknown |
| User group + effect + condition | Fortification + generic | Condition + presentation form |

**Table 1:** Motivation patterns unattested in studied corpus

Turning now to morphological processes employed in encoding these motifs, Table 2 shows the distribution of names according to process.

| Occurrences of processes | | | | | | |
|---|---|---|---|---|---|---|
| Endocentric compounds | Exocentric compounds | Copulative compounds | Abbreviation | Clipping | Blending | Word manufacture |
| 12 | 3 | 1 | 4 | 68 | 95 | 26 |

**Table 2:** Word formation processes employed in studied corpus

It is obvious from Table 2 that blending and clipping together account for 163 out of the 209 trade names. Together the three compound types account for just 16 of the total, while word manufacture (or coinage) is used for 26 of the names[3]. The

latter corresponds to single-unit terms with the motivation unknown (cf. appendix 1).

With respect to our first objective, therefore, it is obvious that many more possibilities for trade naming exist than have been actually used in the three drug categories under study. Leaving aside for a moment the point about implausible selections/sequences, the 37 patterns used out of the 1885 possibilities amounts to only 1.9%. We note that some of the most frequent motifs in our trade name corpus are: generic (in 134 names), unknown (in 110 names), manufacturer (in 39 names), and condition (in 34 names). The least frequent motifs include: user group (in 1 name) and base (in 1 name). As far as morphological processes are concerned, it is obvious for instance that compounds are not nearly as frequently used as clipping and blending.

The foregoing will be at the background in the following sections on resourcefulness and perfidy.

### 3.2. Resourcefulness in naming

Intuitively, there could be a host of parameters for assessing what resourcefulness in trade naming is: a) ease of recall; b) ease of pronunciation; c) transparency of the drug's essential characteristics (to health professionals, but also to the clientele); d) mirroring of some strategic interest (e.g. corporate identity) or other essence-consecutive characteristics (presentation form, etc.); e) distinctiveness, that is, attaining all or several of the above parameters without demonstrably being liable of infringement of other trademarks. Below we shall be concerned with (aspects of) parameters c – e.

Paradoxically, motif 'unknown' is in absolute terms the second most numerically significant motif, after 'generic' (cf. appendix 2). From the standpoint of transparency of a drug's characteristics, the 25 instances of single-unit names with motif 'unknown' are apparently problematic. Informants who are medical students or fresh medical graduates claim that recognition of a drug is enhanced when the trade name implements motifs that are easily matched with some general characteristics, such as chemical grouping (generic), condition treated, effect, etc. The learning curve is a lot steeper with trade names that are integrally based on proper nouns or motifs that are not generally known. So, within what must be considered a tension system of transparency and distinctiveness, the 25 single-unit trade names implementing motif 'unknown' are very distinctive and are unlikely to contribute to name-related medication errors. However, this putative resourcefulness loses its value, or translates into a challenge, in settings where, because of concern with faking, physicians have to actually know and prescribe trade names rather than generics.

By the same token, where there is an attraction to motifs that are transparent, the challenge inevitably becomes one of how to maintain some form of distinctiveness.

Appendix 2 shows that the motif 'generic' is in absolute terms the most frequent, with 52 occurrences name-initially and a further 83 occurrences in other positions.

As the data below will show, distinctiveness seems to be achieved through the creative use of clipping and through blending of generic name parts with a variety of other formants (full, clipped or abbreviated names of manufacturer or of other proper names, form of drug, user population, etc.).

Consider Table 3 below which shows that there are three manufacturers with naproxen-based products.

| Naproxen | |
|---|---|
| Trade name | Manufacturer/importer |
| Apo-Naproxen | Lahams, Nigerian agent to Apotex Pharmaceuticals, Canada |
| Hoproxen | Hovid (Malaysian). Phamatex is Nigerian agent. |
| Naxen | Swipha (Swiss Pharma, formerly Roche) |

**Table 3:** Attempts at reflecting the generic, Naproxen

Swipha's 'Naxen' is a composite front-back clipping: the generic is clipped in such a way that the initial and final syllables of the base remain ('na + xen'). The middle syllable 'pro' is thus deleted. Hovid, on its part, uses back clipping (as it deletes the initial syllable 'na'), and the outcome is then blended with the first syllable ('Ho') of its name. Manufacturer Apotex retains the entire generic name, then blends it with a front clipping of its name 'Apo'.

The deletion of the middle syllable in 'Naproxen>Naxen' can also be seen in Table 4 with the two amodiaquine-based drugs in our corpus.

| Amodiaquine | |
|---|---|
| Trade name | Manufacturer/importer |
| Amoquin | Pharma-Deko |
| Camoquin | Pfizer |

**Table 4:** Attempts at reflecting
the generic Amodiaquine

While manufacturer Pharma-Deko only clips, taking away the third syllable 'dia', Pfizer blends the outcome of the same process with an initial (unknown, difficult to recover) C. Since Camoquine from Pfizer came before Amoquin, manufacturer Pharma-Deko would be said to have failed to be sufficiently distinctive if such a claim of confusion were ever made.

So far, we have seen instances of 2-3 proprietary drug preparations competing for use of the generic name. Let us now turn to a situation where 26 trade names are able to reflect the generic 'chloroquine' and still maintain a measure of distinctiveness. Table 5 below presents the relevant data.

| Chloroquine-based drugs | | | | | |
|---|---|---|---|---|---|
| **Reflecting initial syllable (Chlo)** | | **Reflecting initial & final syllables** | | **Reflecting final syllable (quine)** | |
| *Trade name* | *Manufacturer* | *Trade name* | *Manufacturer* | *Trade name* | *Manufacturer* |
| Avloclor | Reals | Kloquin | Ranbaxy | Assiquine | Dizpharm |
| Fapchlor | Food & Pharma | Moko chloroquine | New Healthway | Capquine | Evans |
| Pentaclor | Morison | | | Donaquine | Doyin |
| | | | | Emzoquine | Emzor |
| | | | | Fevaquine | David |
| | | | | Fevokine | GSK |
| | | | | Kidiquine | BCN |
| | | | | L-quine | Leady-pharma |
| | | | | Malaquine | Farmex-Meyer |
| | | | | Mathewquine | Daily need |
| | | | | Maxiquine | Vitabiotics |
| | | | | Miraquine | Mirapharm |
| | | | | Nasmoquin | Nasdmu |
| | | | | Nivaquine | May & Baker |
| | | | | Normaquine | Geneith |
| | | | | Quimal | Dana |
| | | | | Robaquine | Swipha |
| | | | | Samquine | Sam |
| | | | | Silaquine | GoldMoore |
| | | | | Tavquine | Justeen |
| | | | | Ultiquine | Ulticare-Lyka |

**Table 5:** Attempts at reflecting generic Chloroquine

A new entrant into medical practice in the community where these drugs are marketed hardly has a problem associating these trade names with the generic chloroquine. Table 5 shows that of the three syllables in the generic name – chloroquine – it is the final one that is the most used. 'Quine' becomes something of a final combining form (Bauer 1983:214) to which a variety of formants (manufacturer name, other names, etc.) can be 'prefixed'. It is interesting that the initial orthographic syllable 'chlo', in the much fewer instances where it is used in

the proprietary versions, does not occur word-initially. Fronting proper names, particularly when they reflect the manufacturer, allows for the simultaneous attainment of two goals: projecting the manufacturer's corporate identity and reflecting the generic name of the drug.

It is equally instructive to note from Table 5 that even when drug companies implement the very same motifs in the names of their drugs, distinctiveness can be achieved through sequencing of the motifs. Though in the pair 'Malaquine' and 'Quimal' the extent of clipping of the combining motifs is not identical, there is no mistaking that both trade names implement the motifs 'malaria' and '(chloro)quine'. Looking at drugs under the different generic name 'Quinine', we find further confirmation of the resource that sequencing represents: 'Quinimax' is largely a mirror image of the chloroquine-based 'Maxiquine'.

While the combining formant 'quine' is the hallmark of chloroquine-based products, clipped versions of malaria (notably: mal, lari) are more evenly spread across all genera of antimalarials. Table 6 shows this.

| Clippings of malaria as formant | | | |
|---|---|---|---|
| **Mal** | Generic name | **Lari** | Generic name |
| Maladrin | Chloroquine | Lariago | Chloroquine |
| Malaquine | ---- ditto --- | Lariam | Mefloquine |
| Quimal | ---- ditto ---- | Laridox | Sulfadoxine + pyrimethamine |
| Malagold | Quinine | Larimal | Amodiaquine + artesunate |
| Antimal | Sulfadoxine + pyrimethamine | | |
| Malakare | ---- ditto --- | | |
| Malcidal | ---- ditto --- | | |
| Maldox | ---- ditto --- | | |
| Maloxine | ---- ditto --- | | |
| Malpan | ---- ditto --- | | |
| Malwin | ---- ditto --- | | |
| Ridmal | ---- ditto --- | | |
| Malafloq | Sulfadoxine + pyrimethamine + mefloquine | | |

**Table 6:** Attempts at reflecting 'mal' and 'lari'

As Table 6 shows, the clipped 'mal' is more often used, and more word-initially than word-finally.

Although we have no explanation why certain drugs are not included in our reference resource, the Emdex Formulary, there is a rather interesting pattern that is noticeable when some of these non-documented drugs are considered alongside the ones in our data. It does seem that even when the motifs in two or more trade names are fundamentally the same the specific lexical, orthographical and phonetic realisation or name encoding of these motifs may be different. In Table 7 below we use the concept of lexical functions to illustrate this. Following Mel'cuk, a lexical function is a semantic abstraction, comprising an argument to which is assigned a function in order to obtain institutionalized realizations/expressions in language of the given function (Antia 2000:137). Supposing a function, *Antiver*, standing for 'not the appropriate or expected form'; in the context of the argument (**drug**), the institutionalized expressions in English would include: fake, substandard, adulterated, counterfeit, and so on.

| Facets | Against | Cause to end | Condition | Fortification |
|---|---|---|---|---|
| **Malarial drugs** | **Anti**mal | **Rid**mal | **Mala**drin | |
| | ***A**malar | Mal**cid**al | **Palu**drine         > French: paludisme | |
| | | | **Palu**ther | |
| **Analgesics** | | Pain**kil** | | Pentax **Plus** (paracetamol 500mg + caffeine 25mg) |
| | | Pen**go** | | Zimol **Extra** (paracetamol 500mg + caffeine 30mg) |
| | | Pen**stop** | | |
| | | | | |
| **Rheumatoid arthritis drugs** | | Arthracid | | |
| | | Romacid | | |

**Table 7:** Different motif realisations in trade names (*not in Emdex formulary)

Notice that the function 'against' is realised as 'anti' and 'a' in malarial drugs; the lexical function 'cause to end' in analgesics as three verb realisations (kill, go, stop); phonological and orthographical clippings of the composites of 'rheumatoid arthritis' provide two realisations of this condition (arthr and roma) to which 'cid', a realisation of the lexical function (cause to end) is added.

It is equally interesting to note that some manufacturers have attempted to uniquely identify their products by consistently or frequently using the following pattern of trade naming: manufacturer's name (usually front-clipped) blended with some other formant (generic name, form of drug, etc.). Table 8 presents the data.

| Emzor product range | Apotex product range | Food & Pharma product range |
|---|---|---|
| Empirin (~ + aspirin) | Apo-Keto SR (~ + Ketoprofen + slow release) | Fapdol (~ + paracetamol) |
| Emcap (~ + capsule) | Apo-Naproxen (~ + Naproxen) | Fapchlor (~ + chloroquine) |
| Emzorquine (~ + chloroquine) | Apo-Piroxicam (~ + Piroxicam) | |
| | | |
| **Hovid product range** | **Mirapharm product range** | |
| Hostan (~ + unknown) | Mira-para (~ + paracetamol) | |
| Hoproxen (~ + Naproxen) | Miraquine (~ + chloroquine) | |

**Table 8:** Corporate identity advertised in trade names

These names have the effect of projecting the corporate identity of the manufacturers. A visit to the websites of several of these companies confirms that this pattern is one that is quite frequently used. See, for instance, the following websites:

- Emzor Pharmaceuticals: www.emzorpharma.com/html/product_catalog.htm
- Apotex: www.apotex.ca/Products/EN/Default.asp

With respect to Apotex, it would appear that all its drugs have the 'Apo' prefix.

The question arises as to whether the resourcefulness represented by the use of a motif representing corporate identity does not sometimes lead to drug confusion as data such as the following might suggest: Barbi**mol** (paraceta**mol**-based) and Barbi**mox** (amoxicillin-based). The particular manufacturer, Juhel, wishes to use Barbi as its identity marker.

To conclude, what we see in much of the preceding discussion is an almost frenzied foraging of generic names and conditions for motifs to be used in trade names. The search has seen a most creative use of morphological processes (e.g. clipping and blending) and motifs like 'quine' and 'pain' (some of which are realised orthographically, phonetically, or as corruptions of both: kine, pen). When proper names (e.g. manufacturers' names) are thrown into the combination of motifs and pharmaceutical lexical functions (each of which can be lexically realised in a variety of ways), what we have is a confirmation of the impression that the pool of motifs for drug naming is large. It is precisely this potential that invites a rather different assessment of the practice of genericizing trade name parts.

### 3.3. From resourcefulness to perfidy: genericizing of trade name parts

Besides the naming strategies that are driven by the need to reflect characteristics of the drug, there are other strategies that are more concerned with exploiting resources of actual trade names. Admittedly, there is no way of knowing whether a given mala- or -quine trade name seeks primarily to reflect some characteristic of the drug (generic name, the condition it treats, etc.) or is merely a subterfuge for

imitating or exploiting an actual trade name. As a result of this dilemma, the discussion in this section is limited to the exploitation (by some manufacturers) of existing trade names which are not in any way motivated by any attribute of the corresponding drugs (generic name, the condition they treat, manufacturer, delivery form, etc.). Exploiting such trade names typically has the effect of converting to generic what is actually a proper name (or name part), and the practice smacks of infringement of trademark.

Let us consider the piroxicam-based drugs in Table 9 below.

| Piroxicam-based drugs | | | |
|---|---|---|---|
| Trade name | Manufacturer/importer | Trade name | Manufacturer/importer |
| **Fel**dene | Neimeth (Formerly Pfizer Products Plc) | Apo-piroxicam | Lahams (Apotex) |
| **Fel**oxin | Diamond Remedies (Sole agent for Tenderwell Ltd, England) | Artrite | Strides Vital |
| **Fel**vin | Greenlife (no foreign link) | Grevicam | Geneith |
| **Fel**xicam | Hovid | Piro | Titan |
| | | Proxisam | Sam |
| | | Reumadene | LBS |
| | | Ricam | GoldMoore |
| | | Roxiden | Fidson |

**Table 9:** Attempts at genericizing trade name parts (Feldene)

Although not in our corpus and not reflected on Table 9 above, Felwyn and Felvacap 20 are two unregistered piroxicam-based drugs that were until recently openly marketed in Nigeria. Now, with the exception of Artrite and Reumadene, the trade names in the third column of Table 9 can be seen to make use of various clipped parts of the generic drug. Apo-piroxicam is a combination of the formant 'Apo' (from the Canadian manufacturer, Apotex) and the generic name.

From the standpoint of genericizing trade name parts, the drug names in the first column of the Table are rather interesting. There is no known characteristic of the generic, Piroxicam, or of any proprietary preparation that has 'Fel…' as name. A look at an international resource, the American AHFS Drug Handbook (2003), shows that 'Feldene' is one of three proprietary versions of Piroxicam on sale in US and Canada. This, together with the number of Internet search hits, suggests that Feldene is a more established name than Feloxin or Felvin.

Unlike, say, instances of orthographically or phonetically realized *'consonant + in'* (e.g. xin, dene), etc. which have established themselves as common endings for drugs (irrespective of drug category), the repeated use of 'Fel' must be motivated by considerations we shall speculate on in section 3.4. The inference will inevitably be drawn against the backdrop of the pool of naming possibilities described earlier.

The trade name 'Panadol' (generic: Paracetamol; synonym: acetaminophen) is one whose final syllable has also been genericized. Consider Table 10 below, which lists in the first column some trade names that reflect the generic, and in the third column other trade names with questionable motivation.

| Select trade names based on paracetamol ( > **par**a-**acet**yl-**am**ino-phen**ol**) | | | |
|---|---|---|---|
| Trade name | Manufacturer | Trade name | Manufacturer |
| Acamol | Dizpharm | Pana**dol** | GSK (GlaxoSmithKline) |
| Barbimol | Juhel | Chema**dol** | Chemiron |
| Fevamol | David | Fap**dol** | Food & Pharma |
| Gatmol | Gateway | Mathew**dol** | Daily need |
| Leadmol | Leady-pharma | Phar**dol** | Pharma-Deko |
| Nacemol | Nasdmu | Remi**dol** | Ranbaxy |

**Table 10:** Attempts at genericizing trade name parts (Panadol)

It is difficult to describe as mere coincidence the replication or genericization of *dol* in the third column of Table 10, or to say that in each case there is a unique motivation for this ending. The pioneer preparation is Panadol, which has been traded under that name since 1956 (cf. Wikipedia). Again, *dol* is unlike, say, orthographically or phonetically realized forms of '*consonant + in*,' etc. which are common endings for drugs (irrespective of drug category). There is nothing in the chemical compound that is *dol*. Even if the argument were made that *ol* was traceable to the chemical compound, the question would still remain as to why other manufacturers felt the need to copy *dol* from the pioneer preparation. We could just as well have had *Chemol* or *Chemanol*, *Fapol*, etc. After all, the popular US brand, Tylenol, ends with *ol*. It should be noted that although there is a generic by the name Tramadol (which is also an analgesic), none of the above drugs is based on it.

So far we have seen genericization of trade name parts across manufacturers. There is an interesting case in our data of in-house replication of part of a trade name. Again, the part in question has nothing to do with any of the characteristics of the drug. Consider Table 11 below.

| Two antimalarials from Swipha | |
|---|---|
| Trade name | Generic name |
| Fansidar | Sulfadoxine + pyrimethamine |
| Fansimef | Sulfadoxine + pyrimethamine + mefloquine |

**Table 11:** In-house genericizing of trade name parts

Assuming, as we are compelled to by the data, that Swipha's initial trade name, Fansidar, represents a blending of Fansi + dar, the question arises as to what the motivation for these items is, as they can hardly be related to the generic name, to the condition treated, manufacturer, etc. At any rate, by the time manufacturer Swipha was ready to launch another antimalarial that combines mefloquine

chloride with the compounds of the previously successful Fansidar, it decided to front clip Fansidar, blending the result with a front clip of mefloquine. The outcome, Fansimef, now makes Fansi look like such popular combining forms as: -quine, mala, etc. While in the best of possible worlds, this would have come across as an excellent strategy for uniquely identifying Swipha's antimalarial product range with the formant Fansi, and protecting this formant from use by competitors keen on taking advantage of the market popularity of Fansidar, there is no guarantee of this happening in light of the ***Fel-*** and ***-dol*** cases.

In concluding this section it is obvious that clipping is the major tool for genericizing name parts, with blending being the morphology of the finished process.

### 3.4. Trade naming and the challenge of fair trade, safety and regulation

Our corpus of trade names raises issues related to fair trade practices, efficacy and safety of medication, and the regulatory environment within which drug names are approved.

A legally registered trade name confers rights and privileges on the name owners, and protects them from all such actions that can be construed as undermining the privileges appertaining to the exclusive use of the duly registered trade name. As a subset of intellectual property, these industrial property rights are obviously infringed when it can be demonstrated that, notwithstanding the *caveat emptor* injunction, clients repeatedly and erroneously buy or are made to buy a given medicine in the belief that it is the same as the one they wished for.

A quick reaction test (of sameness or difference) administered either aurally or visually might see some respondents claiming identity of the following pairs of trade names:

> Feldene – Felvin
> Fevaquine – Fevokine
> Camoquine – Amoquine

To give an example with the first pair: a potential aural confusion arises from the stealing of the initial syllable and the identical placement by both buyer and seller of the primary stress on this syllable. If the initial syllable is stressed, then confusion is likely to arise. As vowel length (in ene of Feldene and in of Felvin) may not be an issue for potential buyers, this would mean that the unstressed second syllables share a high front vowel /i/ and an alveolar nasal /n/, and are differentiated only by consonants: the alveolar plosive /d/ and the labiodental fricative /v/. The foregoing analysis of the degree of phonetic match between the two names can be expressed thus:

F e l d e n e
| | |   |
F e l v i n

In applying the orthographic measure to any pair, one would be interested in the number of steps it takes to convert one name to the other, then dividing the number by the length of the longest string (Dorr & Kondrak 2003). Thus, the orthographic distance between the Fevaquine – Fevokine pair is $^3/_9$, (0.33), whereas the orthographic similarity is $^6/_9$ (0.66). For the pair, Camoquine – Amoquine, the distance is $^1/_9$ (0.11), whereas the similarity is $^8/_9$ (0.88). Assuming that in an environment with low literacy levels the threshold of orthographic difference in two trade names were placed at a minimum of 65%, then these two pairs would fail the distinctiveness test. In the light of the numerous naming possibilities described earlier, there is hardly any justification (other than perfidious intent) for the similarities in names.

It is not only in the mistaken impression of sameness that a manufacturer's rights can be infringed. These rights can be infringed when a drug is named in a way that gives the impression that it is from the same stable (manufacturer) as another with which the public is already very familiar. How easily the fortunes of the pioneer drug, Feldene, can be affected by the other Fel-names can be seen from local trading practices in Nigeria. As earlier described, the client's question 'do you have XB?' is hardly answered by 'No.' The typical vendor's answer is 'We have XD', implicating to the client that the available XD is the same as XB. With sound-alike name parts, the client who, when confronted with completely different names (XB and AG), might have asked a few more questions or insisted on the prescribed XB, now lowers his *caveat emptor* guard and settles for XD. The effect, from a commercial standpoint, is that the manufacturers of XB lose out on sales revenue.

In an environment where fake drugs have been of concern, a fake manufacturer who chooses to maintain some unique identity even in thievery finds in a look/sound-alike name an effective means for passing off the fake drug as being in some way related to what the unsuspecting public knows to be the genuine drug. Here again, the manufacturer of the genuine drug is losing out on revenue.

It is no doubt to counter occurrences such as these that the local manufacturers of Panadol run TV and radio adverts with the message: 'if it is not Panadol, it is not the same thing as Panadol.' Obviously, a judgement of infringement here would have to be contextually circumscribed. Thus, given the time-depth associated with the widespread genericization of ***dol*** (from Panadol), the use of this formant today might elicit less negative assessment compared to that of ***Fel***, which perhaps is also more strikingly perfidious because it occurs name-initially.

This aside, the Panadol message is not mere marketing gimmickry. The point is that chemical equivalence is not the same as bioavailability. In other words, when drugs are compounded on the same generic, formulation variables will markedly affect availability. A sodium base for a drug has a relatively faster speed of delivery (i.e. absorption) compared to a potassium base for the same drug. Similarly, a patient who has been advised to reduce salt-intake would be running a risk with a drug that has a sodium delivery base. For instance, in the management of musculo-skeletal

pain in a known hypertensive, diclofenac potassium (Cataflam[R]) would naturally be preferable to its sodium counterpart (Voltaren[R]). In effect, an adverse drug event can occur when the trade names of two drugs (derived from the same generic) lead to the presupposition of identity in pharmokinetic properties.

The situation is of course worse when the name confusion is in respect of drugs that treat different conditions. Novadex (in our corpus) is a paracetamol-based analgesic, while Nolvadex (not in our chosen corpus, but listed in the same Emdex Formulary) is a tamoxifen-based drug for the treatment of breast cancer. The orthographic distance between Novaldex and Novadex is $^1/_8$ (0.12), whereas the similarity is $^7/_8$ (0.87)! Given what is known of physicians' handwriting, it is attention to accompanying information (such as dosage, strength, sex of patient, etc.) that would prevent one drug from being mistaken for the other in a handwritten prescription form.

Such confusing pairs can sometimes be the result of a rather lengthy corporate identity marker. It was seen earlier that manufacturer Juhel uses Barbi as its identity marker. This situation thus leads to a potentially confusing pair like Barbi**mol** (a paraceta**mol**-based drug) and Barbi**mox** (an **amox**icillin-based drug).

All of the foregoing clearly challenges regulatory authorities and the legal environments within which they work. This is as true within a country as it is across national borders. It is well within the remit of a national drug administration agency to refuse to register a given trade name licence application. Such an agency of course can only enforce its powers if (a) it is aware of the perfidious nature of the name application, (b) it can find appropriate legal support to back a denial, and (c) if it is sufficiently committed to carrying out its mandate. It is one or the other factor that explains what must be considered an international industry-wide perfidy. To take an example outside of our data, the Indian manufacturer, Rajat, has produced a drug for male erectile dysfunction which is being traded under the name, Miagra, clearly motivated by Pfizer's Viagra. In the October 3, 2005 issue of the Nigerian daily, *Thisday*, Pfizer and Nigeria's drug control agency (NAFDAC) alerted the public to the existence on the market of ten brands of what was described as 'Counterfeit Sildenafil Citrate tablets,' noting that Viagra is the only registered brand of this product. Some of the disparaged trade names include: Vega, Pangra, Penegra, Pesigra, Ceagra, Jeansiagra, Vinagra. There is absolutely nothing in either impotency or Sildenafil Citrate that motivates the replication of the tri-, quadri- or quinqui-gram: *gra/agra/iagra*.

Awareness of the perfidious nature of a name licence application can also be hinged on the information management systems and sources available to a drug administration agency. Limited access to trade names internationally means a narrow base for decision-making as far as trade name licence applications are concerned. We notice, for instance, in our data that there is an Aspirin-based drug manufactured by a Nigerian company, Emzor Pharmaceuticals, and called Empirin (< front clipping of manufacturer name + back clipping of generic). A look at the

AHFS Drug Handbook (2003) shows that an Aspirin-based drug exists in the American market that goes by the same name, Empirin. A Nigerian patron of Emzor visiting the US might consider what he finds there as the American packaging of the home product. Of course the reverse situation also holds. The need for international cooperation in the processing of trade name applications is obvious.

## 4. Conclusion

When public health is defined as societal action in guaranteeing collective health, it is a statement of what we all from our various disciplinary and other biases and standpoints can do to secure our collective health. In previous studies on childhood diarrhea (cf. Antia, Omotara, et al 2003), animal care (cf. Antia, Mohammadou, Tamdjo 2004), health planning (cf. Antia & Fankep 2004), our point has been to show what can be offered by such branches of linguistics as the following: text analysis, terminology and sociolinguistics (specifically, multilingualism). In the present study, we have shown what morphology, that branch of linguistics that deals with the internal structure of words, can offer.

This morpho-semantic study has shown manufacturers targeting a core of motifs or brand attributes which are then encoded (often via blending and clipping) into trade names. It is a reflection of the resourcefulness of some manufacturers that they are able to propose different realisations of this core motif set, and thereby maintain some form of distinctiveness. It has also emerged that some manufacturers have actually given thought to, and implemented, a systematic and consistent pattern of naming their medicines. On the other hand, we have seen trade names that smack of perfidy. Remarkable in this respect is the conversion to generic of what is otherwise a unique name-part. This and some of the otherwise resourceful naming practices have been shown, through a combination of orthographic and phonetic measures, to have the potential for causing confusion. The health, commercial and regulatory challenges such confusion raises are discussed.

It is no doubt a statement of the significance of the linguistic discipline of morphology that its application to the study of drug trade names can provide the basis for the following recommendations:

> a) National drug administration agencies, such as Nigeria's NAFDAC, need to review trade names already approved by them in order to: identify and commend best practices; identify possible safety and industrial rights concerns; revoke those trade name licences considered problematic. Nigeria's NAFDAC can reverse itself and revoke names, pursuant to the agency's registration guidelines 2004, which state at section D4 that: 'Any drug whose name, package or label bears close resemblance to an already registered product or is likely to be mistaken for such registered product, shall not be considered for registration.'

b) These agencies need to periodically review and revamp their trade name licensing procedures to make them keep pace with industry-wide issues and challenges, including perfidy. There is probably a need to define the threshold of non-acceptable resemblance. Indeed, it could be the absence of a linguistically defined threshold of (non)acceptable resemblance that has seen trademarks make it through the scrutiny net of NAFDAC's provisions in (a) above.

c) Drug manufacturers need to have a rethink on their trade naming practices, in light of the possible safety and legal implications of these practices. As in some other environments, they should bear the burden of proving distinctiveness of a proposed trade name in line with the regulatory agency's standards. There are, in Nigeria, some trade names that derive from local languages (e.g. Alagbin Plus, Alabukun powder). There could be some sense to exploiting this resource, given that national proficiency in English is regularly estimated to be about 30% of the population.

d) There needs to be greater information sharing among national drug control agencies. For instance, national databases of approved drug names could be linked as a safety valve for look-alike or sound-alike names across national boundaries. The importance of such collaboration is better appreciated in an age where travel has become very easy.

e) National legislations need to be strengthened in such a way as to make the use of confusingly similar trade names actionable under infringement laws, and such other provisions as passing off, misrepresentation or other laws regulating unfair business practices.

## 5. Notes

[1] The foregoing may give the erroneous impression that the discussion is primarily of Nigerian interest. On the contrary, several of the manufacturers are non-Nigerian. Whether or not they maintain some local presence (regional or scientific office, import agency) under their traditional names, several companies like Pfizer, Roche and Bayer have incorporated in Nigeria under different names (Neimeth, Swiss Pharma, and Gemini, respectively). Others like Hovid (Malaysian) and Rajat (Indian) operate in Nigeria under the names by which they are known in their mother countries.

[2] It is outside of our current scope to define permissible motif permutations. See Nkwenti-Azeh (1994) for a relevant analysis of positional and combinational constraints in compound terms from the field of telecommunications.

[3] The foregoing is actually a slight simplification of the word forming processes. At times, the processes are actually complex, and involve some recursiveness. The trade name, Strimol Extra, is first formed from a clipping of the manufacturer's name (Strides Vital) and a clipping of the generic (mol > paracetamol). The

outcome, Strimol, is blending. The addition of Extra converts Strimol into a grammatical head, and the entire trade name becomes an endocentric compound (interpretation: 'Strimol Extra is a type of the head, i.e. Strimol'). While this construction should ideally be reported as blending + endocentric compound (as in appendix 4), in Table 2 above it is reported simply under blending.

## 6. Acknowledgement

## 7. References

*AHFS Drug Handbook* (2003). 2nd edition. Philadelphia: Lippincott Williams & Wilkins & American Society of Health-System Pharmacists.

Antia, B.E. (2000). *Terminology and Language Planning: an alternative framework of discourse and practice*. Amsterdam/Philadelphia: John Benjamins.

Antia, B.E., Omotara, B.A., Rabasa, A.I., Addy, E.O., Tomfafi, O.A.A, Anaso, C.C. (2003). Obtaining more reliable data for diarrheal intervention programmes: rethinking on knowledge, attitude and practice (KAP) studies. *Journal of Health, Population and Nutrition*, June; 21(2): 127-141.

Antia, B.E., Mohammadou, Y., Tamdjo, T. (2004). Knowledge Management, Terminology, Veterinary Anthropology. In: Ahmad, K., Rogers, M., editors (2004). *Proceedings for the 15th European Symposium on Language for Special Purposes*. Surrey: Dept. of Computing/Centre for Translation Studies, University of Surrey, U.K. 304 – 310. Available on the internet at: http://www.computing.surrey.ac.uk/lsp2003

Antia, B.E. & Fankep, B. (2004). Multilingualism and Healthcare in Nigeria: A Management Perspective. *Communication & Medicine. An Interdisciplinary Journal of Healthcare, Ethics and Society*. Vol. 2(1). vol. 1(2), 107-117.

Bauer, L. (1983). *English Word-formation*. Cambridge: Cambridge University Press.

Dahlberg, I. (1995). Conceptual Structures and Systematization. *International Forum on Information and Documentation*, 20(3), 9 – 24.

Dorr, B.J. & Kondrak, G. (2003). Computational linguistic techniques applied to drugname matching. Available on the web at: http://www.fda.gov/cder/meeting/drugNaming.htm (consulted 1st February 2006).

Department of Health (2000). *An organisation with a memory*. London: The Stationery Office.

Department of Health and Human Services (2003). Minimizing Medication Errors— Methods for Evaluating Proprietary Names for Their Confusion Potential; Public Meeting. *Federal Register*, vol. 68/no. 104, Friday, 30th May 2003, 32529-32530.

Emdex (2005). *Emdex Complete Drug Formulary for Nigeria*. Lagos: Lindoz

Francis, N. W. (1981). Word-making: some sources of new words. In: Clark, V.P., Eschholz, P.A., Rosa, A.F. (eds). *Language: introductory readings*. 3rd edition. New York: St. Martin's Press.

Hassall, H.H. (2003). Proprietary name testing using 'prescription analysis studies'. Available on the web at: http://www.fda.gov/cder/meeting/drugNaming.htm (consulted 1st February 2006).

Jaszczak, K. (2003). Evaluating drug names similarities applying handwriting recognition technologies. Available on the web at:
http://www.fda.gov/cder/meeting/drugNaming.htm (consulted 1st February 2006).

Kohn, L.T., Corrigan, J.M., Donaldson, M.S., eds. (2000). *To err is human: building a safer health system*. Washington DC: National Academy Press.

Lesar, T.(2003). Look-alike and sound-alike medications: practitioner perspectives. Available on the web at: http://www.fda.gov/cder/meeting/drugNaming.htm (consulted 1st February 2006).

Mathews, P.H. (1991). *Morphology*. 2nd edition. Cambridge: Cambridge University Press.

NAFDAC (2005). Global trends in drug counterfeiting. Available on the web at:
http://www.nafdacnigeria.org/globaltrends.htm (consulted 4th March 2006).

NAFDAC (n.d.). Guidelines for Drug Registration in Nigeria. Available (like other NAFDAC guidelines) on the web at:
http://www.nafdacnigeria.org/newregs.html (consulted 4th March 2006).

Nkwenti-Azeh, B. (1994). Positional and combinational characteristics of terms: Consequences for corpus-based terminography. *Terminology*, 1(1), 61 – 95.

Omstead, S. (2003). Trademark evaluation process: an industry perspective. Available on the web at: http://www.fda.gov/cder/meeting/drugNaming.htm (consulted 1st February 2006).

Wikipedia (n.d.). Paracetamol. Available on the web at:
http://en.wikipedia.org/wiki/Panadol#Available_forms (consulted on 5th March 2006).

**Appendix 1:** Motivation unknown (including proper noun) alone or as modifier (i.e. in initial position) = 83; total occurrence of unknown in all positions = 109

| | Motivation pattern | Examples | Generic {Category} | Morphological process | Remarks |
|---|---|---|---|---|---|
| 1 | Unknown (no = 25) | Tabalon | Ibuprofen {Anti-inflammatory} | Word manufacture | |
| | | Feldene | Piroxicam {Anti-inflammatory} | | |
| | Unknown + unknown (no = 1) | Alka-Seltzer | Aspirin. Synonym: acetylsalicylic acid; ASA {Analgesic} | Copulative compound | |

| | | | | | |
|---|---|---|---|---|---|
| 2. | Unknown + fortification (no = 5) | Alagbin Plus | Aspirin. {Analgesic} | Endocentric compound | |
| | | Pastin Extra | Paracetamol. Synonym: acetaminophen {Analgesic} | | |
| 3. | Unknown + generic (no = 44) | Lapdap | Chlorproguanil + dapsone {Antimalarial} | Blending | |
| 4. | Unknown + strength (no = 3) | Lam 200 | Ibuprofen {Anti-inflammatory} | | |
| | | Voltaren SR | Diclofenac {Anti-inflammatory} | Endocentric compound | SR = slow release |
| 5. | Unknown + generic + fortification (no = 1) | Zimol Extra | Paracetamol. {Analgesic} | Blending (+ endocentric compound) | |
| 6. | Unknown + stolen (no = 2) | Mathewdol | Paracetamol {Analgesic} | Blending | |
| 7. | Unknown + substance (no = 1) | Meracaf | Paracetamol {Analgesic} | Blending | |
| 8. | Unknown + presentation form (no = 1) | Oruject | Ketoprofen {Anti-inflammatory} | Blending | ject < injection |

**Appendix 2:** Generic alone or as modifier (i.e. in initial position) = 52; total occurrence of generic in all positions = 134

| | Motivation pattern | Examples | Base {Category} | Morphological process | Remarks |
|---|---|---|---|---|---|
| 9. | Generic + unknown (no = 16) | Roxiden | Piroxicam {Anti-inflammatory} | Blending | |
| | | Ibunex | Ibuprofen {Anti-inflammatory} | Blending | |
| 10. | Generic + unknown + strength (no = 1) | Arthlon-50 | Artesunate {Antimalarial} | Blending (+ abbreviation) | |
| 11. | Generic + manufacturer (no= 4) | Paradana | Paracetamol {Analgesics} | Blending | Manufacturer name is Dana |
| | | Proxisam | Proxicam {Anti-inflammatory} | | Manufacturer name is Sam |
| 12. | Generic + manufacturer + strength (no = 1) | Indobeta-25 | Indometacin {Anti-inflammatory} | Blending (+ abbreviation) | Manufacturer name is Beta Drugs |
| 13. | Generic (no = 14) | Clofenac | Diclofenac {Anti-inflammatory} | Clipping | |
| | | Cicam | Piroxicam {Anti-inflammatory} | Clipping | |
| 14. | Generic + strength (no = 4) | Artequin-600 | Artesunate + mefloquine {Antimalarial} | Blending (+ abbreviation) | |
| | | Q-300 | Quinine | Abbreviation | |
| 15. | Generic + category (analgesic) (no = 4) | Diclogesic | Diclofenac {Anti-inflammatory} | Clipping | |
| | | Indogesic | Indometacin {Anti-inflammatory} | | |
| 16. | Generic + condition (no = 2) | Quimal | Chloroquine {Antimalarial} | Blending | |
| | | **Pri**malar | Sulfadoxine + **pyr**imethamine {Antimalarial} | | |
| 17. | Generic + condition + fortification (no = 1) | Ibupain forte | Ibuprofen {Anti-inflammatory} | Blending (+ endocentric compound) | |
| 18. | Generic + base + strength (no = 1) | CQP-500 | Chloroquine {Antimalarial} | Abbreviation | CQ= Chloroquine P= Phosphate |
| 19. | Generic + attribute (no = 2) | Arsumax | Artesunate {Antimalarial} | Clipping | max < maximum (if there were evidence of less stronger versions, max would have been assigned under category 'fortification' |
| | | Quinimax | Quinine {Antimalarial} | | |
| 20. | Generic + generic (no = 1) | Parafen | Paracetamol. Synonym: Acetaminophen {Analgesic} | Clipping | |
| 21. | Generic + substance (no = 1) | Parakaf | Paracetamol {Analgesic}. Caffeine. | Clipping | |

**Appendix 3:** Condition/cause alone or as modifier (i.e. in initial position) = 28; total occurrence of condition/cause in all positions = 34

| | Motivation pattern | Examples | Base {Category} | Morphological process | Remarks |
|---|---|---|---|---|---|
| 22. | Condition (no= 3) | Lariam | Mefloquine {Antimalarial} | Clipping | Lariam<Malaria Changed sequence of letters |
| | | Artrite | Piroxicam {Anti-inflammatory} | Clipping | < Arthritis |
| 23. | Condition/cause + unknown (no = 4) | Reumadene | Piroxicam {Anti-inflammatory} | Blending | Rheumatism |
| | | Malagold | Quinine {Antimalarial} | | |
| 24. | Condition + manufacturer (no = 1) | Malpan | Sulfadoxine + pyrimethamine {Antimalarial} | Blending | Manufacturer name is Panvij Biotec |
| 25. | Condition + generic (no = 9) | Malaquine | Chloroquine {Antimalarial} | Clipping | |
| | | Malafloq | Sulfadoxine + pyrimethamine + mefloquine {Antimalarial} | | |
| 26. | Condition + effect (no= 9) | Painkil | Paracetamol {Analgesic} | Exocentric compound | |
| | | Penstop | Paracetamol {Analgesic} | Exocentric compound | |
| 27. | Condition + presentation form (no = 1) | Febrilix | Paracetamol {Analgesic} | Blending | |
| 28. | Condition + stolen (no = 1) | Reumadene | Piroxicam {Anti-inflammatory } | Blending | |

**Appendix 4:** Manufacturer as modifier (i.e. in initial position) = 33; total occurrence of manufacturer in all positions = 39

| | Motivation pattern | Examples | Base {Category} | Morphological process | Remarks |
|---|---|---|---|---|---|
| 29. | Manufacturer + generic (no = 24) | Hoproxen | Naproxen {Anti-inflammatory} | Blending | Manufacturer name is Hovid |
| 30. | Manufacturer + generic + fortification (no = 1) | Strimol Extra | Paracetamol. Synonym: acetaminophen {Analgesic} | Blending (+ endocentric compound) | Manufacturer name is Strides Vital |
| 31. | Manufacturer + generic + strength (no = 1) | Apo-Keto SR | Ketoprofen {Anti-inflammatory} | Endocentric compound (+ abbreviation) | SR = slow release |
| 32. | Manufacturer + presentation form (no = 1) | Emcap | Paracetamol. Synonym: acetaminophen {Analgesic} | Blending | Manufacturer name is Emzor |

| | | | | | |
|---|---|---|---|---|---|
| 33. | Manufacturer + strength (no = 1) | M & B 5 | Paracetamol. Synonym: acetaminophen {Analgesic} | Abbreviation | Manufacturer name is May & Baker |
| 34. | Manufacturer + unknown (no = 2) | Vitadar | Sulfadoxine + pyrimethamine {Antimalarial} | Blending | Strides Vitalis |
| 35. | Manufacturer + stolen letter sequence/syllable (no = 3) | Chemadol | Paracetamol {Analgesics} | Blending | Manufacturer name is Chemiron |
| | | Phardol | | | Manufacturer name is Pharma-Deko |

**Appendix 5:** Attribute as modifier (i.e. in initial position) = 3; total occurrence of attribute in all positions = 5

| | Motivation pattern | Examples | Base {Category} | Morphological process | Remarks |
|---|---|---|---|---|---|
| 36. | Attribute + presentation form (no=1) | Toptabs | Aspirin {Analgesics} | Exocentric compound | |
| 37. | Attribute + generic (no=2) | Dependol | Paracetamol {Analgesics} | Blending | |

**Appendix 6:** Stolen alone or as modifier (i.e. in initial position) = 6; total occurrence of stolen in all positions = 14

| | Motivation pattern | Examples | Base {Category} | Morphological process | Remarks |
|---|---|---|---|---|---|
| 38. | Stolen (no = 1) | Panda | Paracetamol {Analgesics} | Clipping | Cf. Panadol |
| 39. | Stolen + presentation form (no = 1) | Voltaren emulgel (cf. Voltaren) | Diclofenac {Anti-inflammatory} | Endocentric compound | |
| 40. | Stolen + unknown (no=3) | Feloxin | Piroxicam {Anti-inflammatory} | Blending | 'Fel' is probably taken from the pioneer drug in the category, 'Feldene'. |
| | | Felvin | | | |
| 41. | Stolen + generic (no=1) | Felxicam | | | |
| | | Fansimef | Sulfadoxine + pyrimethamine + mefloquine {Antimalarial} | | 'Fansi' is probably taken from the earlier 'Fansidar'. |

**Appendix 7:** Miscellaneous = 4

|  | Motivation pattern | Examples | Base {Category} | Morphological process | Remarks |
|---|---|---|---|---|---|
| 42. | Effect + condition (no = 2) | Antimal | Sulfadoxine + pyrimethamine {Antimalarial} | Clipping | |
| 43. | Presentation form + generic (no = 1) | Capquine | Chloroquine {Antimalarial} | Clipping | |
| 44. | Group + generic (no=1) | Kidiquine | Chloroquine {Antimalarial} | Clipping | Kidi >Kiddies |

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# ABSTRACT

# Drug Trade Names:A Morpho-Semantic Study in Resourcefulness and Perfidy

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Linguistic analyses of drug trade names are of interest because they reveal the challenges of uniquely identifying proprietary medicines and because responses to these challenges can have a range of implications: health (medication errors), commercial (compromised sales figures of specific brand names), and legal (protection of industrial property rights). Regrettably, and to the disadvantage of many stakeholders, these perspectives have scarcely been brought to bear on the trade in medicines in a complex environment such as Nigeria, which is a microcosm of environments in the developing world.

Based on a corpus of trade names for three categories of medicines (non-opioid analgesics and antipyretics, nonsteroidal anti-inflammatory drugs, and antimalarials), we do a morpho-semantic analysis of proprietary drug names marketed in Nigeria. In part, our objectives are to determine how resourceful manufacturers have been in assigning trade names to drugs; to ascertain whether and how trade naming contributes to unfair trade practices and to the potential for adverse drug events; to identify challenges which drug naming practices pose to regulatory authorities and the legal framework within which these authorities operate.

This morpho-semantic study shows manufacturers targeting a core of motifs or brand attributes, which are then encoded (often through blending and clipping) into trade names. It is a reflection of the resourcefulness of some manufacturers that they are able to propose different realisations of this core motif set, and thereby maintain some form of distinctiveness. On the other hand, we also see trade names that smack of perfidy or of an intention to cause deception. Remarkable in this respect is the conversion to generic of what is otherwise a unique name-part. This and some of the otherwise resourceful naming practices are shown, through a combination of orthographic and phonetic measures, to have the potential for causing confusion. The health, commercial and regulatory challenges such confusion raises are discussed.

The study shows the relevance of linguistic scholarship to public health, thus confirming and extending some of our previous work: text analysis and childhood diarrhea (Antia, Omotara, et al 2003), terminology and animal care (Antia, Mohammadou, Tamdjo 2004), multilingualism and health planning (Antia & Fankep 2004), etc.

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