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Wishful thinking: when scientists hope

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*‘Hope’ is the thing with feathers—
That perches in the soul—
And sings the tune without the words—
And never stops—at all—
Emily Dickinson*

Introduction

Subjectivity, notably persuasive and interpersonal discursive elements, has been recognized as an integral aspect of academic writing (Grossmann & Tutin, 2014; Hyland & Bondi, 2006). As writers in the hard sciences describe their methodology, results and conclusions, they also attend to negotiating a dialogue with their readers and maintaining a representation of their work and selves. Much research has been accorded to positioning, including stance and engagement, and to authorial roles, including the role of evaluator. A gamut of linguistic options has been examined in the area of interpersonal discourse, such as personal pronouns, citation, hedges and boosters, and directives. However, there are fewer studies on attitude markers (*e.g. surprisingly, it is fortunate that*), that convey a writer’s “attitudes towards the propositional content and/or readers, rather than a commitment to the truth-value” (Crismore *et al.*, 1993: 53, cited by Blagojević, 2009: 64; Connor, 1996: 49; Samraj, 2014: 51).

This paper contributes to this discussion of authorial presence inherent to research writing through an analysis of lexical formulations of desire¹. It evaluates the context of the lemmas HOPE and WISH found within the Scientext² corpus (7,564 texts comprising 35,244,378 words) of published medical and biology research

¹ Part of this study was initially presented at the conference “Acceptabilité, transgression et médiation dans le domaine des langues et cultures de spécialité” organised by ILCEA (Institut des langues et des cultures d’Europe et d’Amérique) at the Université Stendhal in Grenoble the 17th and 18th of October, 2013.

² <<http://scientext.msh-alpes.fr/scientext-site/spip.php?article9>>.

articles. The hypothesis is that these expressions of desire are employed within a limited set of subjects, notably personal pronouns, and correspond to specific authorial actions. The objective of this corpus study is to further our knowledge of personal and evaluative constructions of academic writing.

Theoretical framework

Sancho-Guinda & Hyland (2012: 4) define *stance* as “a continuum of evaluative meaning which varies along two axes: one epistemic and interpersonal (*i.e.* from feelings and attitudes to a status of knowledge) and the other linguistic (*i.e.* from lexis to grammar)”. The integration of feelings within academic discourse is also highlighted by Fløttum *et al.* (2007) and Fløttum & Vold (2010) who propose four authorial roles: *writer*, *researcher*, *arguer*, and *evaluator*. The verbs related to the role of *writer* include discourse act verbs (*describe, illustrate, outline, present, show*) or to guiding the reader (*begin by, focus on*) (Dahl, 2004). The *researcher* embodies both physical and cognitive acts (*analyze, consider, study, test*), while *arguer* embodies position and stance (*argue, claim, dispute, reject*). The least common, *evaluator*, has an evaluative or emotional component (*feel, be skeptical*).

According to the *Merriam-Webster On-line Dictionary* (2015), WISH (to want [something] to be true or to happen) and HOPE (to want something to happen to be true and think that it could happen or be true) are similar in their desire, but in contrast, HOPE incorporates an impression of attainment. HOPE originates in the Old English *hopian* akin to Middle High German *hoffen*, signifying *to hope*. Its archaic meaning is similar to *trust*, but it is currently used to mean “to desire especially with expectation that the wish will be granted”. Finally, WISH comes from Middle English *wisshen*, from Old English *wyscan*, akin to Old High German *wunsken*.

Although WISH encompasses the notion of desire, its definition (to have a desire for [as something unattainable]), conveys less certainty of reaching a goal than HOPE. However, WISH refers to the action “want or ask to do something”, which recalls the action-laden notion of the Sanskrit *vanoti*. Although the noun HOPE contains the notion of anticipation (the feeling of wanting something to happen and thinking it could happen or be true), the noun WISH also evokes an action (a desire for something to happen or be done: a feeling of wanting to do or have something). HOPE and WISH are closer to cognitive or motivational attitudes as the physical reaction related to an emotion is absent in these definitions.

In the psychological sense, an affect, in contrast to cognitive or motivational attitudes, comprises a physical reaction to a stimulus, as is the case for positive reactions such as anger and fear or the negative ones of pride and excitement. Here, the actual physical reaction felt by the authors of the research article are beyond the scope of this study (see: Dörnyei, 2009; Ekman, 1999). Hence, we employ here the term of *attitude* or *sentiment*, when referring to the phenomena expressed by HOPE and WISH.

Methodology

The quantitative and qualitative data were collected by querying the on-line Scientext corpus of research articles published in English and housed by the LIDILEM laboratory (Tutin *et al*, 2009; Falaise *et al*, 2011; Hartwell, 2013). This particular corpus was collected by the LiCorn team at the Université de Bretagne-Sud. It contains texts originally published between 1997 and 2005 by the independent editor BioMed Central in 137 on-line journals distributed under within sixty-two subthemes from the fields of biology and medicine, such as genomics, bioinformatics, genetics, and women’s health. The texts were encoded TEI (Text Encoding Initiative) and tagged for parts of speech and lemmas using Treetagger. The annotations of morphology and syntax were obtained thanks to Syntext (Tutin & Falaise, 2014). Its large size makes it a valid source for the study of academic verbs (Williams 2012).

The initial queries produced the overall results displayed in Table 1. However, some of these occurrences refer to an attitude or sentiment acknowledged by a person other than the authors of the paper. Not included in these figures are the 78 occurrences of the acronym HOPE or the last name Hope. To facilitate comprehension, the lemmas are indicated in capital letters, specific forms in italics, and the reference to the Scientext entries in parentheses (*e.g.* #123).

	Noun	Verb	Adverb
HOPE	260	477	118
WISH	40	256	0

Table 1 – Initial Scientext results before elimination of noise

These initial results present lexico-grammatical tendencies, revealed by frequency: the presence of the noun forms of HOPE, the verbs HOPE and WISH, and the adverb *hopefully*. In the following study of patterns of these higher frequencies, occurrences that do not refer to authorial desire are eliminated. In order to better understand the context of authorial desire, these patterns are reviewed to determine the agent of desire and the corresponding or projected actions. Also present in the corpus is the past participle *desired*, the most frequent collocations being: *desired level* (n = 23), *desired number* (n = 19), *desired effect* (n = 15), *desired outcome* (n = 14), *desired function* (n = 11), *desired target* (n = 10), *desired mutation* (n = 10), *desired traits* (n = 10), *desired concentration* (n = 10), *desired outcomes* (n = 10), and *desired information* (n = 10). However, DESIRE was not found as a verb or noun, and thus is not discussed in the following sections.

Agent of desire

The authorial, goal-oriented desire may be conveyed as uniquely belonging to the authors or may be considered to be shared by a larger audience (Hartwell & Jacques, 2014). Here, we will look at the degree of possessiveness as expressed by first person pronoun use and linguistic devices that reduce authorial presence, including extraposition, adverbs, and past participles used as adjectives.

The authors very frequently refer to themselves by simply employing for themselves the pronoun *we* (n = 467) as the sentence subject before the verb WISH (n = 245) or HOPE (n = 222). However, there is a range of tenses with this collocation, the most frequent being: *we hope* (n = 194), *we wished* (n = 147), *we wish* (n = 94). So, while HOPE is more often used in a present tense in collocation with *we*, a past tense form is more frequent with WISH.

The pronoun *one* (n = 91) as the subject and agent reduces authorial presence while creating a link with the reader, this with the two verbs WISH (n = 37) and HOPE (n = 10). The past tense is rare (n = 2) in this case, the most frequent collocations being in the present tense or with a modal verb of possibility: *one wishes* (n = 26) or *one might wish* (n = 12). The primary lexical agent of desire is hence *we* and this with all of the verbs, except DESIRE, but also with an inclusive *one*.

Also present were collocations with lexical subjects: *researcher-s* + WISH (n = 12), *investigators* + HOPE (n = 2) or WISH (n = 2) and *biologists* + WISH (n = 1), as in the following examples:

in many cases biologists **wish** to move from genomic sequence... (#834)

this clearly suggests that if investigators **wish** to use a screening instrument... (#5178).

Here, there is an important use of modal verbs (n = 8), the most frequent pattern being: *researcher-s may wish* (n = 5) or *might wish* (n = 1). Hence, the authors are clearly present in the text, claiming their wish. When they broaden the agency of wishing to others through the use of the pronoun *one* or the term *researchers*, the proposition is often hedged by a modal verb.

Authors may also be linguistically disconnected from the expressed desire. Of the four lemmas, only the adjectival form *desired* was found in this corpus, namely, *desired level* (n = 26), *desired outcome* (n = 24), *desired number* (n = 20), and *desired effect* (n = 17), but also *if desired*, which most often referred to methodological decisions of researchers (n = 22), for example:

Additional genes can be removed from the validated set if **desired** (#7241)

This latter scale can, if **desired**, be further sub-divided (#5211).

Only the verb HOPE was used in the initial position in sentences beginning with an anticipatory *it*: *it is hoped* (n = 72), *it was hoped* (n = 13). Finally, of the four lemmas, only the adverb form *hopefully* was found in this corpus. In the corpus, it is used exclusively as a sentence adverb, meaning it qualifies the entire sentence and not just a specific verb. It is often followed by the modal verb *will* (n = 45), which is consistent with its meaning of expectancy. After decades of international debate, the *American Press Stylebook* (2012) approved the use of *hopefully* as a sentence adverb in their message of April 17th, 2012: “Hopefully, you will appreciate this style update, announced at #aces2012. We now support the modern usage of hopefully: it’s hoped, we hope.” Like *interestingly* or *fortunately*, it may be used to modify the entire sentence without clearly identifying the persons who hope, as in these examples:

It hopefully will prove useful for molecular biologists dealing with... (#245)

... giving us a **hopefully** conservative estimate... (#355)

Each of the three lemmas has its preferred form, as can be visualized in Table 2. While the past participle *desired* serves as an adjective that may refer to a contextualized, often methodological desire, the verbs HOPE and WISH are collocated with *we*, thereby indicating the authors as the source of agency. To a lesser degree, these two verbs are also collocated to the sentence subjects *one* and *researcher-s*, extending the wish to the audience. Finally, the anticipatory *it is hoped* and the sentence adverb *hopefully* add an inclusive dynamic to the evaluation.

	<i>we</i>	<i>one, researchers, biologists, or investigators</i>	adverb
HOPE	222	12	118
WISH	245	49	0

Table 2 – Most frequent patterns related to agency

Desired action

After establishing the most frequent sources of agency of the desire, I turn now to the verbs that were found in patterns after the given subjects (*we, one, researcher-s, biologist-s, investigator-s*) and the verbs HOPE and WISH. The initial results produced a perhaps surprisingly comprehensive collection totaling 112 different verbs in 150 patterns with *we* WISH, 41 different verbs in 54 patterns with *we* + HOPE, 25 different verbs in 32 patterns with *one* + WISH, three different verbs in three patterns with *one* + HOPE, and finally three different patterns with *investigators* and two with *biologists* (see Appendix 1). The most frequent verbs and patterns are listed in Appendix 2. These results demonstrate a wide range of lexical verbs occurring in multiple patterns (Hartwell, 2013). For example, the verb COMPARE is found in three different patterns that vary by both subject and tense:

- when/if one wishes to compare (n = 4)
- we wished to compare (n = 4)
- we wish to compare (n = 4)

In other patterns, we find again the hypothetical status indicated by *if* or the goal-oriented futurity of HOPE, as in the following two examples containing the verb ELUCIDATE:

- if **we wish to elucidate** the causes and consequences of their origin (#2458)
- In future studies, **we hope to elucidate** the impact of such factors (#806)

The wide range of lexical verbs in these patterns corresponds to the four authorial roles of *writer, researcher, arguer, and evaluator* as summarized in Table 3.

	<i>writer</i>	<i>researcher</i>	<i>arguer</i>	<i>evaluator</i>
Frequent verbs	address present emphasize focus on state describe highlight note report show tell	determine compare use test obtain estimate study investigate consider uncover	know confirm propose decide validate infer reveal	encourage pave

Table 3 – Representative verbs related to authorial roles

Examples of these verbs in their authorial roles are characteristic of the range of the associated lexical verbs:

Writer: **we wish to highlight** that our data include citations only to original research (#1736)

Researcher: **we hoped to uncover** some of the complexities of the hh signaling system (#4403)

Arguer: **we wished to validate** its use for aminooxy compounds (#1304)

Evaluator: **we hope to pave** the way for research that links response shift phenomena to other critical areas of research (#5202)

These examples incorporate the evaluative and motivational attitudes embodied in HOPE or WISH with a specific authorial role of *writer*, *researcher*, *arguer* or, to a lesser degree, *evaluator*. Here, I propose the constructions *encourage* and *pave the way* as characteristic of the *evaluator's* role of determining the value of a given aspect. In these expressions, the positive evaluation is expressed as a plea for the continuation of a research direction in the future.

An analysis of verbs in sentences containing *hopefully* confirmed the goal-oriented perspectives for the future; as for 61 verbs directly following *hopefully*, 43 are syntactically linked to the modal verb *will*. The vast majority of these verbs relate to future positive change: *will result* (n = 4), *will lead* (n = 3), *will allow* (n = 3). Also found are the roles of writer (*address*, *emphasized*), researcher (*confirm*, *provide*), arguer (*confirm*, *prove*), and evaluator (*spur*, *entice*).

Finally, a manual evaluation of the nouns leads to the removal of the occurrences that were unrelated to authorial wishes, reducing the total to 165 tokens of *hope-s* and a few *wish-es*. The occurrences of the noun *wish* highlight again the motivational aspects of the term and the positioning of the research community's wishes:

One important **motivation** for developing gene sharing was **the wish** to identify distinct sets of genes (#7104).

Since the development of total hip replacement (THP), there has been a **wish** to evaluate the intervention (#5130).

The most frequent string is: *it is our hope that* (n = 19), but other collocations include the adjectives *only* (n = 4), *new* (n = 3), *more* (n = 2), *realistic* (n = 2), *reasonable* (n = 2), *great* (n = 2) and *real* (n = 2). It appears that authorial hopes remain grounded within the study and the projections are deemed real and reasonable.

Conclusion

This analysis has attempted to determine the contrasting linguistic characteristics and discursive functions of the lemmas HOPE and WISH as markers of attitude in published research articles in the sciences. While HOPE is employed as a noun, verb, and adverb, WISH is almost exclusively found in its verbal form in the Scientext corpus. HOPE is more often employed when discussing the future of their own hopes for the research, but also the research community's hopes in general, as embodied by its collocation with the modal verb *will*:

We hope this report **will stimulate** renewed interest in the field (#6319)

These two lemmas are employed throughout the various sections of the research articles (abstract, introduction, development, and conclusion) largely in both the past and present tenses. The modal verb *may* is often found in constructions that broaden agency to researchers in general:

In practice, however, **one may wish** to find the optimum of this function (#368).

HOPE and WISH convey a sense of subjectivity, whose origins border the realms of cognition, motivation, and emotion. Their frequent collocation with the pronoun *we* and the possessive adjective *our* before *hope* suggests that authors claim this subjective authorial presence. However, the constructions comprising *it is hoped*, the adverb *hopefully*, the pronoun *one* or with other subjects such as *researchers*, also allow writers to render the evaluative subjectivity more inclusive of the community. Further research might compare these markers of attitude to other markers related to motivation, such as *aim*, *want*, or *objective*. Also of interest would be a comparison with the subjectivity of formal oral contexts, such as conference presentations.

Concerning the four authorial roles (*writer*, *researcher*, *arguer*, and *evaluator*) the subjectivity of HOPE and WISH are first linked to the critical and generally less frequent role of *evaluator*. However, the verbs collocated with HOPE and WISH cover the broad range of authorial roles. Furthermore, the variety of verbs in collocation is particularly rich, such as *garner*, *leverage* or *pave* (Appendix 1). Hence, although we find formulaic expressions, such as *it is our hope that*, both lemmas are integrated into more complex structures related to methodology, the writers' past, present and future research objectives, but also the desire that their findings have a wider, positive societal impact. In this manner, authors position themselves as subjective beings claiming motivations for their methodology and chosen research objectives.

These researchers evolve in a highly competitive environment, where the quest for funding and resources is a constant occupation for the vast majority. In their

study of biomedical research articles, Gross & Chesley (2012) found that hedging decreases, but persuasive language increases as funding increases. Hence, this wider socio-economical context may incite researchers to emphasize the importance of their research findings and the pertinence of their methodological decisions through both objective and subjective discourse. Research authors appear to find a balance between reiterating their commitment to the “communicative furtherance of [the discourse community’s] aims” (Swales, 1990/2004) and positioning themselves within that community as they evoke personal and shared aspirations.

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Appendix 1 – Quantities of occurrences and patterns per verb in the string [we/ one/ researchers/ biologists/ investigators] + [HOPE/WISH] + [to] + [verb]

Verb	Occurrences	Different patterns
determine	27	3
compare	12	2
use	10	5
test	8	2
be able, find, make	6	3
explore, have, know	5	2
estimate	5	1
address, obtain, present, study	4	2
investigate	4	1
develop	3	3
improve, provide	3	2
emphasize, examine, focus on	3	1
achieve, assign, detect, elucidate, identify, model, predict, propose, publish, replicate, state, understand,	2	2
avoid, demonstrate, describe, discover, eliminate, encourage, evaluate, extend, help	2	1
abandon, adjust, allow, analyse, ask, assess, begin, build, calculate, carry, catalyse, clarify, come, conduct, confirm, consider, control, correlate, decide, distinguish, enable, engineer, enhance, establish, express, facilitate, garner, generalize, generate, get, highlight, incorporate, increase, infer, interpret, label, learn, leverage, look, maintain, measure, monitor, move, note, overcome, pave, perform, post, prevent, produce, pursue, rank, receive, refer, release, remove, report, reveal, search, see, select, shift, show, solve, stimulate, take advantage, tell, uncover, validate	1	1
	244	149

Appendix 2 – Most frequent verbs in the string

we/ one/ researchers/ biologists/ investigators] + [HOPE/WISH] + [to] + [verb]

	Number of occurrences	Quantity of different patterns	Most frequent patterns
DETERMINE	27	3	<i>we wished to determine</i> (n = 23)
COMPARE	12	3	<i>one wishes to compare</i> (n = 4) <i>we wished to compare</i> (n = 4) <i>we wish to compare</i> (n = 4)
USE	10	5	<i>one wishes to use</i> (n = 2)
TEST	8	2	<i>we wished to test</i> (n = 7)
FIND	6	3	<i>we wished to find</i> (n = 2) <i>we wish to find</i> (n = 2)
MAKE	6	3	<i>we wish to make</i> (n = 4)
ESTIMATE	5	1	<i>we wish to estimate</i> (n = 5)
EXPLORE	5	2	<i>we wished to explore</i> (n = 4)
BE	5	3	<i>we hope to be</i> (n = 3)
HAVE	5	2	<i>we wish to have</i> (n = 3)
KNOW	5	2	<i>we wish to know</i> (n = 3)
STUDY	4	2	<i>we wish to study</i> (n = 3)
INVESTIGATE	4	1	<i>we wished to investigate</i> (n = 4)
EMPHASIZE	3	1	<i>we wish to emphasize</i> (n = 3)
FOCUS	3	1	<i>we wish to focus</i> (n = 3)