Commentary on the CPA Analysis of the verb 'bubble'

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Introduction

CPA is an empirical analysis of the verbs of English and their arguments. It seeks to identify patterns of normal verb use and to link patterns to meanings. The 'arguments' (also called 'valencies') are identified not only in terms of their part-of-speech class but also according to their semantic type. So, for example, the most common pattern for the verb *fire* does not merely say "Subject (noun) *fire* Direct-Object (noun)" but rather "[[Human]] *fire* [[Weapon]]". The words in double square brackets are semantic types, relating to items in the CPA "shallow ontology", which is being developed in parallel with the verb patterns.

CPA attaches meanings (called 'implicatures') to patterns, rather than to the verb in isolation. It distinguishes patterns of normal use from exploitations of those patterns.

Analysis of Norms

This commentary is designed to be read in conjunction with the five verb patterns for **bubble** in the *English Verb Pattern Dictionary*.

The apparently simple, straightforward verb **bubble** turns out to contain unexpected and interesting semantic complexities. In the first place, in its most literal meaning (pattern **1**), it is one of a minority of English verbs that do not have [[Human]] as the semantic value of the subject. Underlying most modern uses of **bubble** is the somewhat literal concept (frame?) of a pot full of soup or stew or some other mixture, seething with bubbles that rise to the surface, cooking over a fire or stove (example 1).

1. an infant asleep beside her and a stew bubbling on the stove

This is an old-fashioned, indeed ancient prototype of domesticity. Women in the modern world do not normally spend their days sitting by a stew bubbling on the stove. But its old-fashioned quality is the very fact that means that this prototype is deeply embedded in the language. The meaning of many words is determined by ancient prototypes, not modern science.

Even more ancient (also part of Pattern **1**) is an even more literal frame for the verb, namely the notion of water rising naturally and energetically, intermixed with bubbles of air, to the surface of the earth as a spring (Old English *wella,* the etymon of the modern English word *well*) (examples 2, 3).

> 2. The well bubbled into a tributary of the Moy, but unfortunately it had been hemmed in by modern concrete and so had lost a great deal of its charm.

> 3. on a clear day you might just be able to see the spring bubbling up at

the bottom of the pond.

In FrameNet, this first pattern pattern is part of the "Fluidic_motion" frame. It accounts for only about 15% of uses in the British National Corpus.

Most uses of **bubble** are intransitive—there is no direct object—but in a small group of rather technical domains the general pattern of intransitive (inchoative) use has been exploited sufficiently often in various more or less technical domains to form a domain-specific pattern (pattern **2**) in which the verb is transitive (causative), as in example 4 below. The inchoative/causative alternation is extremely common in English. For some verbs, both a causative and an inchoative pattern coexist peacefully; for others, only one of them is normal, although the other may be found as an exploitation of the norm. This causative pattern of **bubble** in technical English accounts for about 6% of uses in BNC.

> 4. carbon dioxide is removed from hydrogen by bubbling the gaseous mixture through water at high pressure.

Over time (many centuries), the basic concept of 'fluidic motion' has been exploited in various ways to form two or three secondary conventions of meaning and use, each of which is more common than the 'fluidic motion' sense. In the first of these, pattern **3** (20% of sample), the Subject is an abstract noun denoting something such as an attitude, an emotion (example 5), or a process (example 6). The polarity or 'semantic prosody' of the semantic type of this argument is very often negative: *anger* and (to a lesser extent) *speculation* are not good things. In this sense, the verb pattern usually includes an adverbial of direction or location, even if (surprisingly) this adds little or nothing to the meaning of the text. Thus,in some cases (e.g. *away* in 6), the adverbial is merely grammatical or 'completive', expressing at most something like continuation over time, rather than actual movement or location. In patterns such as this, English speakers seem to feel the need to put in an adverbial argument, even if it contributes little or nothing to the meaning of the text.

> 5. ... a far deeper anger [[Emotion]] bubbling just below the surface in less-privileged neighbourhoods of my placid, palm tree-shaded city.

> 6. speculation [[Process]] bubbled away at Westminster about a possible challenge to Mrs Thatcher's leadership.

The next pattern, pattern **4** is most idiomatic phraseological pattern associated with the verb **bubble** (23% of sample). It involves completing the clause with one of two adverbial expressions: *to the surface* and/or *up*—as exemplified in examples 7-9, or with both, as in 10. Here again, the Subject normally has the semantic type [[Emotion]] or [[Attitude]], but here the semantic prosody of the Subject may be positive or neutral, as well as negative.

> 7. She had grown in confidence and self-assurance, her sense of humour frequently bubbling to the surface.

> 8. Emotions quickly bubble to the surface.

9. Idealism and popular opposition bubbled up again and found allies in the younger generation of Communist leaders.

10. it cannot overcome the class-based conflicts that will eventually bubble up to the surface.

Finally, pattern **5**, which accounts for a further 23% of sample, takes a human subject and an adverbial headed by *with*, as in examples 11-13. The prototypical prepositional object is *enthusiasm*, but other psychological entities In English, it is very normal to talk about people *bubbling with ideas, energy, or enthusiasm*, and quite unusual (though not in the least ungrammatical) to talk about someone *bubbling with anger or resentment*.   This contrasts with pattern , where the semantic prosody is negative as often as (or more often than) positive.

11. Bubbling with enthusiasm, Fr Cunningham, 80, said it was the opportunity to work with children which prompted him to accept the latest offer.

12. I was bubbling with ideas.

13. Their honeymoon had been "fabulous", said Diana, bubbling over with enthusiasm.

The force of the particle ***over*** in 13 adds the idea of excess, just as a pot of stew that 'bubbles over', so as to spill some of its contents, has been heated to excess.

Exploitations

The concept of *bubbles* (plural noun), and the notion of water or stew *bubbling* are aspects of the physical world about us that are graphic and memorable, so it is not surprising that this word is readily exploited in many different ways. Only a few examples can be discussed here.

14. Forty tons of Hell bubbled overhead as the dark crucible dipped slowly towards the pit.

Example 14 is an exploitation of pattern 1 because there is nothing in the semantics of the words "forty tons of Hell" to tell us that it is a [[Liquid]]. This fact has to be inferred from the context[1].

15. the puffs of smoke bubbling up below them

15 is an exploitation because the nearest norm that fits is pattern **1**, "[[Liquid]] bubble", but puffs of smoke are not [[Liquid]][2].

16. Suspicions bubble furiously, contacts drop like ninepins

16 is an exploitation only because the expected adverbial for pattern **3** (the best match for a sentence with 'suspicions' [[Psych]] as subject) is missing. It would

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1   The wider context makes it clear that the forty tons of Hell in question is in fact molten metal.

2   There is, of course, nothing obscure or difficult about the meaning.

be equally correct to argue that the adverbial is optional, in which case 16 could be classed as a norm.

> 17. The pot of race relations in the US has been simmering and bubbling furiously

17 is an exploitation of pattern **3** because the word *pot* is mentioned explicitly as the subject of the two verbs, making this sentence a dynamic metaphor rather than a norm. If the subject had been something less graphic—e.g. 'The *problem* of race relations'—and if an adverbial such as ***away*** had been present, this sentence would have been a norm.

> 18. She could certainly bubble over on occasions, but it was never a one-woman show.

18 is an exploitation of pattern **5** (with [[Human]] subject), rather than a straightforward instantiation of it, only because the topic 'with [[Emotion | Attitude]]' is missing. But a few more examples would have confirmed a lurking suspicion that "[[Human]] bubble {over}" may itself be an additional norm.

It will be clear for this discussion that, to some extent, grouping the evidence of concordance lines into patterns calls for art and judgment. It is not a purely mechanical process that can be done by a robot[3]. There is room for differences of opinion, to which there may be no single 'correct' answer[4].

> 18. I lay down and gripped the edges as the rug **bubbled** and rose beneath me.

Finally, it is arguable that example 18 is not an exploitation of any of of the verb patterns, but rather a grammatical metaphor meaning that the rug assumed the shape of a bubble.

Semantically similar verbs
Semantically related verbs are ***boil*** and ***simmer***.

Conclusion
This little case study shows the semantic complexity of a verb that develops the semantics of normal patterns in different conventional (normal) ways as well as in unconventional ways (exploitations). At the same time, the simplicity of the underlying concept (liquid bubbling) is maintained. It shows how people make meanings both by replicating normal patterns in their linguistic behaviour and by exploiting them

Bubble is a difficult verb to analyse, but not a difficult verb to understand. Many verbs that express more complex ideas are easier to analyse syntagmatically.

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3   CPA does, however, establish normal patterns as benchmarks which, when applied to unseen texts by a robot on the general principle, "Best match wins", may determine the most probable meaning.

4   There are plenty of demonstrably <u>wrong</u> ways of analysing the evidence.