Context as a Social Construct

Varol Akman

Department of Computer Engineering and Information Science
Bilkent University
Bilkent, Ankara 06533, Turkey
akman@cs.bilkent.edu.tr

Abstract

This position paper[1] argues that in addition to the familiar approach using formal contexts, there is now a need in AI to study contexts as social constructs. As a successful example of the latter approach, I draw attention to 'interpretation' (in the sense of literary theory), viz. the reconstruction of intended meaning of a literary text that takes into account the context in which the author assumed the reader would place the text. An important contribution here comes from Harris (1988), enumerating the seven crucial dimensions of context: knowledge of reality, knowledge of language, and the authorial, generic, collective, specific, and textual dimensions. Finally, two thought-provoking papers in interpretation, (Barwise 1989) and (Hobbs 1990), are analyzed as useful attempts which also come to grips with the notion of context.

Keywords: (situated) context, co-text, interpretation, belief system, text, author, reader

"[I]n the construction of a satisfactory theory of context, the linguist's account of the interpretation of utterances must of necessity draw upon [...] the theories and findings of the social sciences in general." (Lyons 1995, p. 292)

Introduction

Starting with McCarthy's celebrated article (1987) which formulated the need for (and a glimpse of) formal contexts, a great majority of the AI-based works on context had a logical—thus computational—character. (I refer the reader to (Akman and Surav 1996) for a reasonably detailed review of these works.) While I regard this tendency healthy and of fundamental importance, it is refreshing to see that the "Call for Participation" for the *Context Fall Symposium* noted that "[o]ther academic disciplines, such as linguistics, philosophy, and anthropology, have also studied various aspects of the context phenomena." I believe that any serious progress in further delineating the notion of context will have to borrow from these disciplines, and additionally, from psychology and literary theory. Clark's recent book (1996), which argues that language use embodies *both* individual and social processes, may be regarded as a fine example of the contribution the former discipline (psychology) can make to the scientific study of context. It is my intention to consider the latter discipline (literary theory) in this paper. Specifically, I want to recast a book, (Harris 1988), and two papers in literary interpretation, (Barwise 1989) and (Hobbs 1990), and explain what important observations they include vis-à-vis context. Being a preliminary report, this paper is terse and possibly cryptic; I hope to remedy this situation in the full version.

Context and Experience

In an article originally written more than 15 years ago, Clark and Carlson (1992, p. 60) noted that "[a]lthough the notion of context plays a central role in most current explanations of language understanding, what can count as context is generally undefined." I think that this situation has not changed much, but hasten to add that now we probably have a better idea why we need to define and circumscribe (in the dictionary sense of this word) the extent of context. For, again in the words of Clark and Carlson (1992, p. 60), "[i]f it [context] includes *any information a listener can make available to himself*, then it loses much of its power to explain" (my emphasis).

First, an obvious question. Can there be a notion of sentence meaning that is *independent* of context, i.e., a level at which a given sentence has a single meaning, but may be employed for different purposes? I believe that the answer many semanticists usually give to this question is at least partly in the affirmative. In fact, according to orthodox semantic theory (Allen 1995, p. 228), there is a representation of context-independent meaning called the *logical form*, and the aim of semantic interpretation is simply to map a sentence to its logical form. While this approach yielded many useful results for the toy examples of semantic theory (especially in regard to indexicals and definite descriptions), I think it is misdirected in general and cannot really be of much use in an AI-based study of context. For example, it has been pointed out numerous times that even sentences such as "The cat is on the mat" require a minimal (non-empty) set of *background* conditions, e.g., that the earth's gravitational field is in effect, that the mat is lying flat, that the mat is a standard (normal size) mat, and so on. In the words of Fish (1980, p. 310):

> It is impossible even to think of a sentence independently of context, and when we are asked to consider a sentence for which no context has been specified, we will automatically hear it in the context in which *it has been most often encountered.* (my emphasis)

Considerations such as these dictate that 'experience' may be a comprehensive synonym for 'total context,' because "only that which has entered our experience is available to aid us in interpretation" (Harris 1988, p. 78). Clearly, this experience is a social and cultural construct: it is shaped and obtained by an individual growing up within the confines of a society. (Suzuki (1984) notes that the culture of a country affects all aspects of the life and thought of the people living in that country.) Take the following remarks of Auster (1995, p. 140):

> The text is no more than a springboard for the imagination. 'Once upon a time there was a girl who lived with her mother in a house at the edge of a large wood.' You don't know what the girl looks like, you don't know what color the house is, you don't know if the mother is tall or short, fat or thin, you know next to nothing. But the mind won't allow these things to remain blank; it fills in the details itself, it creates images based on *its own memories and experiences*—which is why these stories [fairy tales] resonate so deeply inside us. (my emphasis)

Auster uses considerations of the above sort to explain why his own writing style, one that is frequently devoid of descriptive passages and the background that characterize the typical novel, is still able to create full-fledged worlds. Having been influenced by fairy tales (the Brothers Grimm, the Thousand and One Nights, etc.), his works communicate in the most economical way large amounts of information simply because, he thinks, the reader is able to supply the details based on her own memories and experiences. In short, "[t]he listener becomes an active participant in the story" (Auster 1995, p. 140).

Notice that the experiential nature of context can cause bona fide confusions for the participants in a 'discourse.' The following example comes from ethnomethodology (Sacks 1992, p. 473):

> On one occasion he [Phineas, a four-year old child] and other children had made a 'ship' in the schoolroom, with an arrangement of tables and chairs. Phineas' part in this was comparatively a passive one, as he was but a 'passenger' on the ship, and was going on with his own pursuits on the voyage, sitting at a table and sewing a canvas bag. Miss D. was with him 'in the ship,' and all around them the crew and the captain carried on the business of the voyage. And when, presently, a new supply of thread was wanted, and Miss D. said to Phineas "Will you get it out of the drawer?" Phineas replied "I can't get out of the ship while it's going, can I?" and called out in a stentorian voice to the 'captain,' "Stop the ship, I want to get out." After some demur, the ship was brought into a 'landing stage' and Phineas got out, secured his thread, and got in again, saying "Now it can go again."

In the reported scene, two agents A and C (Miss. D, adult, and Phineas, child), are individuating the reality in two different ways. C's account of it as a boat scene is at odds with A's account of it as an imitative game, i.e., a game where kids simulate some real environment in their play. C, being totally immersed in the game, does not see that in games rules can be violated whereas A is able to 'switch' to the more realistic context whenever there is such a need. Here is another, similar piece of data mentioned by Sacks (1992, p. 473):

> She [a five-year old girl] looked up at me expectantly, anticipating that I [the teacher] would push her. I said firmly, "No. Put your knee in the wagon and you can push yourself." She sat several seconds, obviously waiting for me to push her. She waited long enough to be certain I wasn't going to push. Then she got down, put one knee in the wagon and the other on the floor of the cement porch, getting ready to push herself. In order to encourage her I said "Come on." She didn't move. She looked straight ahead. She announced, "There's a car coming." Then she looked at me indignantly. She was seemingly disgusted that I couldn't see this car that she announced. An imaginary car was coming, and she had to wait for it to get out of the way.

Again, the teacher is assuming that the little girl can do the pushing act by just leaving the play context for an instant. The girl, on the other hand, is determined to stay within the game context and take the requisite precautions such as minding an approaching car. The contexts of the teacher and the student are at a clash.

Seven Dimensions of Context

In a book I very much respect—and one which must soon receive the recognition it deserves—Harris (1988) surveyed the multitude of interacting kinds of knowledge and awareness that make up the context. According to him, two principal dimensions of context are (i) *world knowledge* and (ii) *knowledge of language.* In case of (ii), the many facets of linguistic knowledge involving word repetitions, abnormal ordering, etc. bring unusual complexities of meaning, as the following excerpt from Charles Olson's *I, Maximus of Gloucester, to You* illustrates:

> But that which matters, that which insists, that which will last
> where shall you find it, my people, how, where shall you listen
> when all is become billboards, when all, even silence, is
> when even the gulls,
> my roofs,
> when even you, when sound itself

As for (i), Leech (1981, p. 69) notes that the study of interpretation in context involves the encyclopedic knowledge of the world—which, he concedes, cannot be practically included in the study of semantics—and gives the following example:

> [I]t is relevant to the interpretation of the sentence "Shall I put the sweater on?" to know whether anyone has yet invented a sweater warmed by an electric current.

Harris enumerates five additional dimensions of context. These are the (iii) *authorial*, (iv) *generic*, (v) *collective*, (vi) *specific*, and (vii) *textual* dimensions. The authorial dimension arises from the body of available information about the author and is clearly crucial in reconstructing the meaning of a text. Some authors do expect their readers to be knowledgeable about particular pieces of information about themselves. For instance, the casual reader of *Soft Machine* (by William S. Burroughs) will be doing a better job of interpretation when she knows that the work has an autobiographical character and that the narrator in the following opening paragraph is Burroughs himself:

> I was working the hole with the sailor and we did not do bad. Fifteen cents on an average night boosting the afternoons and short-timing the dawn we made out from the land of the free. But I was running out of veins.

By the generic dimension, Harris hints at 'genre,' i.e., the category of literary text characterized by a particular style, form, or content. The author's intent to write will necessarily involve some notion of genre (poem, novel, detective story, etc.) and he will most probably employ the conventions of his chosen genre to help the reader assign the proper interpretation (Kessler, Nunberg, and Schütze 1997). It must be noted that awareness of genre cannot be easily achieved unless the reader is knowledgeable about the definitions and commentary of literary historians, e.g., a sonnet is a lyric poem written in a single stanza, which ... bla-bla-bla. For example, in the following poem (*For Hettie*, by LeRoi Jones), humor is certainly part of the author's intent and is achieved by parodying the use of proper English:

> My wife is left-handed.
> [...]
> [...] I sit
> patiently, trying to tell her
> what's right. TAKE THAT DAMN
> PENCIL OUTTA THAT HAND. YOU'RE
> RITING BACKWARDS. & such. [...]

Leaving the co-textual ambiguities aside (for they are rather well-understood, thanks in part to semantic theory), contextual ambiguities are usually born out of a misplaced belief on the part of the author that the reader has access to the author's collective dimension. The author usually assumes that his imaginary reader has a general grasp of the social institutions, customs, norms, etiquette, topical news items, and cultural and historical facts. Harris (1988, p. 107) notes that:

> Such collective knowledge is the subject of investigation from a variety of disciplines: sociolinguistics, ethnomethodology, the sociology of knowledge. John Searle calls such knowledge and awareness 'factual background information'; Charles Altieri calls it the 'cultural grammar'; [Kent] Bach and [Robert] Harnish speak of 'mutual contextual beliefs'; socio-linguists like Dell Hymes speak of the 'ethnography of communication'. Since we also know that we don't all share the same knowledge, we constantly make judgments about how much and what sort of background information or cultural grammar persons to whom we are speaking or writing are likely to possess.

The specific dimension—in contrast to the collective dimension which attributes knowledge to the anticipated reader—comprises elements that are specific to the situation in which a discourse occurs. Harris enumerates five interdependent aspects of the specific dimension (1988, p. 112):

1. The physical situation: A porch in the second Sacks example given earlier.
2. The psychological conditions of the discourse participants: The teacher is indifferent and the little girl is angry and fearful, in the same example.
3. The socio-cultural relationship: Teacher/student, in the same example.
4. Interpersonal awareness: Specific personal knowledge of shared experiences, close to nil in the same example. Interpersonal awareness receives an excellent treatment in (Clark and Carlson 1992), where it is proposed that when a listener tries to understand what a speaker means, the process she goes through can be explained in terms of a *common ground*, i.e., the knowledge, beliefs, and suppositions that the two share in a technical way.
5. For any sentence, the immediately preceding ones: Obvious.

Finally, the textual dimension refers to the totality of arguments, events, actions, etc. in the way these are given in the text. A coherent text is in fact a system of interlocking subtexts, whose interpretations against the unfolding whole make small contributions to the meaning of the complete text. The process is, borrowing T. S. Eliot's words, one with "hundred indecisions" and "hundred visions and revisions," as the following excerpt explains (Harris 1988, p. 119):

> As the text unrolls, there is not only the cumulative build-up of effect through the linking of remembered earlier elements to the new one. There is sometimes a backward flow, a revision of earlier understandings, emphases, or attitudes; there may even be the emergence of a completely altered framework or principle of organization.

Context vs. Co-text, and Disambiguation

It is heartening to find echoes of Harris' observations in other works. For example, Crystal (1991, pp. 78-79) also assumes that context encompasses the total linguistic and non-linguistic background to a text. The linguistics aspects are widely known; they include the specific parts of a text neighboring a unit (e.g., a word) which is the focus of attention. The non-linguistic aspects (which Crystal calls the *situational context*) include the immediate situation in which the unit is employed, and the awareness by the author and reader of what has been said earlier plus the pertinent *belief system* (i.e., those beliefs and presuppositions germane to the text at hand). Here's another concise description of this two-fold character of context, this time coming from Blackburn (1994, p. 80):

> In linguistics, context is the parts of an utterance surrounding a unit and which may affect both its meaning and its grammatical contribution. [...] Context also refers to the wider situation, either of the speaker or of the surroundings, that may play a part in determining the significance of a saying. Sometimes the term *co-text* is used for the narrow, purely linguistic context.

An author assumes that a reader will try to obtain a coherent interpretation of his text. In order to facilitate this, he provides help as to which contextual dimensions are relevant. If there is information the reader is not presumed to have, he makes it available using assorted devices. But in the end, we can never be certain about the authorial intention; the best we can do as a reader is to assess probabilities. Accordingly, the so-called *disambiguating role* of context should be taken with a grain of salt. While it is true that the most useful role context play is in the disambiguation of authorial meaning, this disambiguation will at best attach a certain probability to each available alternative reading (or sense). (Needless to say, a totally ungainly alternative would have zero probability assigned to it.) In the words of Leech (1981, pp. 66 and 68, respectively):

> [The] specification of context (whether linguistic or non-linguistic) has the effect of narrowing down the *communicative possibilities* of the message as it exists in abstraction from context. (my emphasis)

> [M]eaning-in-context should be regarded as a narrowing down, or *probabilistic weighting*, of the list of *potential meanings available* to the user of the language. (my emphases)

My favorite example demonstrating why we cannot take a text and settle on an interpretation without making certain assumptions about the contextual dimensions is due to Hobbs (1990, p. 26):

> When I first read the opening line of Shakespeare's 68th sonnet,
>
> Thus is his cheek the map of days outworn,
>
> I had a very powerful image of an old man whose face was deeply wrinkled. These wrinkles were like the roads on the map of the life he had led. Later I read the footnotes. "Map" meant "symbol." "Days outworn" meant "ancient or classical times." The line meant that his face was the symbol of classical beauty—*almost the precise opposite of my interpretation.* I had interpreted the line against a belief system that included knowledge of Rand-McNally road maps and beliefs about the romanticization of old age. The function of footnotes is to tell the modern reader something of *the belief system Shakespeare must have assumed he shared with his Elizabethan reader.* (my emphases)

Using the above approach of Leech, we can reformulate this by saying that the interpretation achieved as a result of paying attention to the footnotes is the highly probable (consequently the most authentic) one. Hobbs' own interpretation, while it had initially enough intuitive elements to justify it, is thus defeated and assigned zero probability in the end.

In the remainder of the paper, I take a quick look at the proposals of Hobbs (1990) and Barwise (1989), which also include the author's intention and the reader's belief system in elucidating the meaning of a literary work. While these works have numerous aspects which overlap with Harris' theory, I will not explicitly highlight these coincidences and let the reader notice them.

Hobbs

Hobbs assumes that the reader's interpretation procedure works by translating the text into some knowledge representation scheme (e.g., logical formulas) and then drawing inferences from her belief system so as to satisfy the requirements for a 'good' interpretation. He enumerates four crucial elements as belonging to the set of requirements:

1. There is a common ground, of the sort Clark and Carlson (1992) advocate, between the author and the reader.
2. There are constraints in effect which ease the interpretation of many instances of metaphor and metonymy. ("But metaphors do not automatically catch on and influence people; they have to fit in with a feeling in the air, or Zeitgeist, which differs from language to language," cautions Aitchison (1997, p. 91).)
3. Different parts of the text should be taken as coherently interconnected, leading to a unitary structure for the whole. (This also explains in part the difficulties encountered in interpreting post-modern literature.)
4. The text should be related by the reader to her theory of what the author is trying to achieve.

Hobbs comes up with a formula which he thinks is applicable in general:

$$F(K, T) = I$$

Here F is an interpretation procedure employed by the reader. Hobbs thinks that AI work in discourse analysis gave at least some indication what F looks like. T is the sequence of words that comprise the text; it is assumed to be given. (Hobbs puts forward an interesting account of how realistic this assumption is and how it may be disputed. I omit this discussion because it does not contribute to the problem at hand.) I is the interpretation, i.e., a formal representation of the content of the text that satisfies the four points made above. Hobbs is especially careful about the fourth point (1990, p. 18):

> The text needs to be related to the [reader's] theory of what is going on in the environment. Typically, but not always, this includes the [reader's] beliefs about the author's intention, or more generally, the author's plan as it unfolds in time; the [reader] should try to relate the text to what the [reader] believes the author is trying to accomplish.

K is the belief system and includes the whole range of beliefs, from naive knowledge about the physical world (Akman and ten Hagen 1989) to interpretive conventions for assorted genres (Kessler, Nunberg, and Schütze 1997). Basically it is in K the context is encoded.

Since F and T are assumed to be given in the above equation, we must determine K and I. We have an equation with two indeterminates. Hobbs suggests that the way we 'solve' the equation is via hypothesizing a K-I pair. That is, we consider a particular interpretation I of the text together with a belief set K that will uphold I. (Hobbs calls the pair a *theory of the text.*) To decide among alternative theories of text, the reader tries to find the best K and the best I, in the light of the four desiderata (for I) mentioned earlier.

Barwise

Barwise (1989) sees all critical discourse as comprising one or more parts of the following trio: author, literary text, and reader (critic). The critic tries to capture what the author has created. In this endeavor, she assumes that the author's creative process finds its roots in the author's intentions. Barwise notes that the original intention and the 'achieved' intention may not coincide. During the creative process, what the author is trying to do is intentional. However, once the work is created then we have something actual, so the critic should talk about the effect the work aims to evoke, the principles organizing the work into a whole, the meaning the work suggests, etc.

Like Hobbs (1990), Barwise has an abstract equation formulating the relation between meaning and content:

$$Content_R(S, C) = P$$

Here, R is the conventions of the language, C is the circumstances (context) shared by the speaker and listener (or the author and the reader), and P is the propositional content the speaker wants to convey. The author's task is to find an expression S that satisfies this equation. The task of the reader, on the other hand, is to determine P, given R, C, and S. All of the four parameters in the equation are at the speaker's disposal. He can 'adjust' them, as long as the equation is satisfied. Clearly, if the author experiments with R—as in Joyce's *Finnegans Wake* or Burroughs' *Naked Lunch*—there is a lessened chance of his being understood, at least by the casual reader. (Unless, that is, the original text is accompanied by illuminating marginal notes and comments, pace Martin Gardner's annotated *Alice's Adventures in Wonderland.*)

The circumstances (C) can be studied as four parts which may possibly overlap:

1. *Articulated constituents:* This is what we have termed as co-text earlier. In general, it determines the interpretation of indexicals, among others. In the Burroughs example, the co-text contributes the narrator with "I."
2. *Unarticulated constituents:* These are things whose existence follow. When the narrator says "we did not do bad" in the Burroughs example, we understand that "we" stands for the narrator plus the sailor.
3. *Articulated non-constituents:* In the Burroughs example, when the narrator says that "he was running out of veins," we learn that he was frequently doing junk, but this is not part of the content of what the narrator said.

4. *Unarticulated non-constituents:* In the Jones poem, the line "My wife is left-handed" suggests that there is a background convention in force in the narrator's world, whereby people writing with their right hands make up the standard crowd.

The reader of a literary text (S) is faced with one equation in three unknowns: R, C, and P. As in the equation of Hobbs, the solution may not be unique. The task of literary interpretation is to use the available information regarding the unknowns (e.g., biographical material about the author, information about the cultural setting in which the text was written, etc.) to limit the range of their possible values.

Conclusion

Several examples from literary theory show that interpretation is possible only within shared contexts. Since such contexts necessarily have a social disposition, this paper can be seen as underlining the efficacy of a social sciences stance towards a better understanding of the "magic of context."

Acknowledgments

For a brief rendition of some of the issues studied in this paper, cf. (Akman 1994). I owe special thanks to Güven Güzeldere (Duke University) for making that early contribution possible. As usual, I am solely responsible for the views expressed here.

References

Aitchison, Jean. 1997. *The Language Web: The Power and Problem of Words.* Cambridge University Press, Cambridge, UK.

Akman, Varol. 1994. Ripping the text apart at different seams. *Stanford Humanities Review* 4(1): 31-34. [Special supplement: *Bridging the Gap (Where Cognitive Science Meets Literary Criticism)*, Güven Güzeldere and Stefano Franchi (editors).]

Akman, Varol, and ten Hagen, Paul J. W. 1989. The power of physical representations. *AI Magazine* 10(3): 49-65.

Akman, Varol, and Surav, Mehmet. 1996. Steps toward formalizing context. *AI Magazine* 17(3): 55-72.

Allen, James. 1995. *Natural Language Understanding.* Benjamin/Cummings, Redwood City, CA.

Auster, Paul. 1995. Interview with Larry McCaffery and Sinda Gregory. pp. 116-154 in Paul Auster, *The Red Notebook and Other Writings.* Faber and Faber, London, UK.

Barwise, Jon. 1989. On the circumstantial relation between meaning and content. Chapter 3 (pp. 59-77) in Jon Barwise, *The Situation in Logic.* CSLI Lecture Notes, Number 17. Center for the Study of Language and Information, Stanford, CA. [Originally appeared in 1986 in *Versus* 44: 23-39.]

Blackburn, Simon. 1994. *The Oxford Dictionary of Philosophy.* Oxford University Press, Oxford, UK.

Clark, Herbert H. 1996. *Using Language.* Cambridge University Press, New York, NY.

Clark, Herbert H., and Carlson, Thomas B. 1992. Context for comprehension. Chapter 2 (pp. 60-77) in Herbert H. Clark, *Arenas of Language Use.* The University of Chicago Press & Center for the Study of Language and Information, Chicago, IL. [Originally appeared in 1981 in J. Long and A. Baddeley (editors), *Attention and Performance IX*, pp. 313-330. Lawrence Erlbaum Associates, Hillsdale, NJ.]

Crystal, David. 1991. *A Dictionary of Linguistics and Phonetics.* Blackwell, Oxford, UK. Third edition.

Fish, Stanley. 1980. *Is There a Text in This Class?* Harvard University Press, Cambridge, MA.

Harris, Wendell V. 1988. *Interpretive Acts: In Search of Meaning.* Clarendon Press, Oxford, UK.

Hobbs, Jerry R. 1990. Against confusion. Chapter 1 (pp. 9-32) in Jerry R. Hobbs, *Literature and Cognition.* CSLI Lecture Notes, Number 21. Center for the Study of Language and Information, Stanford, CA. [Originally appeared in 1988 in *Diacritics* 18(3): 78-92.]

Kessler, Brett; Nunberg, Geoffrey; and Schütze, Hinrich. 1997. Automatic detection of text genre. Manuscript, cmp-lg/9707002. The Computation and Language E-print Archive (http://xxx.lanl.gov/cmp-lg/).

Leech, Geoffrey. 1981. *Semantics: The Study of Meaning.* Penguin, Harmondsworth, Middlesex, UK. Second edition.

Lyons, John. 1995. *Linguistic Semantics: An Introduction.* Cambridge University Press, Cambridge, UK.

McCarthy, John. 1987. Generality in artificial intelligence. *Communications of the ACM* 30(12): 1030-1035.

Sacks, Harvey. 1992. Games: Legal and illegal actions. Lecture 31 (pp. 473-478) in Harvey Sacks, *Lectures on Conversation* (edited by Gail Jefferson; with an introduction by Emanuel A. Schegloff), Volume I. Blackwell, Oxford, UK.

Suzuki, Takao. 1984. *Words in Context: A Japanese Perspective on Language and Culture* (translated by Akira Miura). Kodansha International, Tokyo, Japan. First revised paperback edition. [Originally published in Japanese by Iwanami Shoten, Tokyo, in 1973 under the title *Kotoba to Bunka* (Language and Culture).]