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HOW DIFFERENT TYPES OF INFERENCING PROVIDE COHERENCE IN NARRATIVE TEXTS


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ABSTRACT

Proceeding from the undeniably explanatory power and divergence of inferential mechanisms from the cognitive perspective and philosophy, we claim that such kind of distinction (especially the asymmetric distribution of different types of inferencing) should play an important role in understanding how global or local text organization affects text comprehension.

Aiming to investigate the impact and role of inferencing in providing coherence in narrative texts in terms of distinguishing between the underlying (non-encoded) and linguistically represented semantic and pragmatic contents in language use, this paper focuses on revealing contribution of the underlying content on text comprehension by applying the inferential mechanisms suggested by the constructionist theory, according to which the author can omit a definite part of information from the text structure and thus make the reader generate the so-called bridging and predictive inferences to represent the missing information. Accordingly, the relation that holds between the two meanings is not only semantic. It is up to the theory to judge how the inferential properties get determined and integrate with the presented semantic content.

The suggested cognitive approach to “search-after-meaning unity” considers meaning holism concept which in turn is derived from the integration of the non-encoded but inferentially revitalizable and the explicitly expressed meaningful relations of an intrasentential or intersentential level.

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STRUCTURED ABSTRACT

Given that pragmatic inference has been richly studied in different fields of science, the main concern of the present research is to investigate the impact and role of inferencing (as a vehicle) in comprehension of narrative texts in terms of distinguishing between the underlying (non-encoded) and the linguistically represented semantic content in language use. Besides, considering the undeniable explanatory power and divergence of inferential mechanisms from the perspectives of cognition and philosophy, as well as psychology, we claim that such kind of distinction (especially their asymmetric distribution) directly leads to understanding how text organization influences text comprehension, which in turn, rests on the assumption that no comprehension process as well as procedure can be isolated from the mental model of the world in discourse. It is this framework within which the reader constructs his/her own mental model not breaking away from writer's original mental model (Kintsch, 1988). Proceeding from the results of a large body of research in the field, we assume that comprehension process "bringing together" and integrate information from the two above mentioned sources between which readers often need to make connections and the issue addressed in this research is the extent to which these interactions lead to encoding of inferences in different functional styles of language. Although some scholars (Graesser et al, 1994; Van den Broek, 1990) argue that comprehenders often need to generate bridging inferences (also known as backward inferences) to establish a coherent representation of a text, the representatives of the behavioral research (Just and Carpenter, 1992; McKoon and Ratcliff, 1992; Singer et al, 1992; Linderholm and Van den Broek, 2002) have shown that causal constraint of a text and the working memory ("WM") capacity of a reader both separately influence bridging and other types of inference generation. Accordingly, there is still much to do in terms of examining the relation between working memory capacity and causal or other constraint interact during the generation of bridging or predictive (i.e., "forward looking") inferences. An inference model, accepted as an obligatory element of story comprehension, is usually presented in a multi-dimensional "situation-state-space" which organizes itself on the basis of a constructed micro-world description. More than that, a story taking place in the micro-world corresponds to a restricted trajectory through this "situation-state-space," while the world knowledge, applied to the story trajectory, in turn, adjusts it to reflect the inferencing of propositions that are likely to cause story coherence to increase.

As items as well as events and relations can rarely belong to a single category, but can be multidimensional, they, accordingly, can be cross-classified into many categories, which, in turn, can give rise to different inferences. This fact by all means enhances the necessity that research from the conceptually specified genres of literature has yet to be investigated to shed light on how coherence might play a role in the induction of cross-classified inferences. Thus, analyzing examples from a story-genre, it is imperative to clarify to what extent (a) inference generation in this functional style plays a significant but a different role in establishing textual coherence; (b) reader's relevant background knowledge is/should be activated and (c) a subset of implicit text information is encoded in the holistic text representation. If to briefly

survey the basic features of narrative communication (differentiating it from a science communication context), it should be stated that narratives mainly follow a particular structure that describes the cause-and-effect relationship between events that take place over a particular time period that impact particular characters; in other words, if the paradigmatic pathway controls the encoding of science-based evidence, the narrative pathway controls the encoding of situational/contextual exemplars, leading to distinct differences in comprehension and processing based on the appropriate pathway used to provide the content (Dahlstrom, 2014: 13615). Supporting such a categorical difference between the mentioned pathways of communication, empirical studies suggest that narrative processing is generally more efficient, since it is often associated with increased or decreased tension, ease of comprehension (due to fall or rise of internal/external conflicts) and shorter space (Zabrucky and Moore, 1999; Rzaev, 2006).

The privileged status of narratives in human cognition come from the fact that narrative cognition adjusts structure to reality and serves as the underlying foundation for memory and this reliance, as some scholars state: (Oatley, 1999:101-117) is the result of an evolutionary benefit of comprehension to simulate possible realities, which in turn, serves to better predict cause-and-effect and other relationships (concessions, predictions, etc.) The other specific feature of narratives stem from their describing a particular experience rather than general truths. The hierarchical steps of inferencing are also among the major concerns of the research.

Keywords: Inferencing, coherence, text organization/comprehension, types of inferences, integration.

FARKLI ÇIKARIM TÜRLERİ, ÖYKÜLEYİCİ METİNLERDE BAĞDAŞIKLIĞI NASIL SAĞLAR

ÖZ

Bilişsel ve felsefi bakış açısı dikkate alındığında, çıkarımsal mekanizmaların inkâr edilemeyecek bir şekilde açıklayıcı gücü ve ayrışması söz konusudur. Bundan yola çıkarak böyle bir ayırım; (özellikle farklı çıkarım türlerinin asimetrik dağılımı) metnin kavranmasında, küresel veya yerel metin düzenini anlamanın önemli bir rol oynaması gerekliliğini öne çıkarır.

Çıkarım yapmanın anlatı metinlerinde tutarlılık sağlamadaki gerek etkisini ve gerekse de rolünü araştırmayı amaçlayan, altta yatan (kodlanmamış) ve dilsel olarak belirtilen sadece semantik değil aynı zamanda da pragmatik içeriklerin dil kullanımında ayırt edilmesi dikkate alındığında, bu makalede altta yatan temel yani kodlanmamış içeriğin metin üzerindeki katkısının açığa çıkarılmasına odaklanmıştır. Yapısalcı kuram ve bu konuyla ilgili filozoflar dikkate alındığında, bu yapısalcı kuramın önerdiği çıkarımsal mekanizmaları uygulayarak buna göre yazar metin yapısından bilginin belirli bir kısmını çıkartabilir ve dolayısıyla okuyucuya eksik bilgiyi belirlemek için sadece birleştirici olarak adlandırılan çıkarımlar değil aynı zamanda da tahmini çıkarımları

da yaptırabilir. Buna göre, iki anlam arasındaki ilişki sadece anlamsal olarak düşünülmemelidir. Dolayısıyla, çıkarımsal özelliklerin nasıl belirlendiğini ve bu belirtilen anlamsal içerikle nasıl bütünleştiğini değerlendirmek teoriden teoriye değişmektedir.

Burada “anlam-sonrası arama birliği” için önerilen bilişsel yaklaşım, sırayla kodlanmış fakat çıkarımsal olarak yeniden oluşturulabilir ve açıkça ifade edilen anlamlı bir ilişki veya anlamlı olmayan ilişkilerin bütünleşmesinden türetilen anlam bütünlüğü kavramını dikkate alır.

Anahtar Kelimeler: Çıkarım, bağdaşıklık, metin organizasyon/anlama, çıkarım türleri, bütünleşme.

Inferencing: Background

A large body of research in this field has indicated that comprehension processes are generally assumed to “bring together” and integrate information from two sources: explicit statements from the text being read and general knowledge already known to the reader. To successfully comprehend a story, individuals often need to make connections between the information from these two sources and the issue addressed in this part of the research is the extent to which these interactions lead to the encoding of inferences in different genres. Let’s consider the example adapted from (Virtue et al., 2006: 104-114): “From the gate, Walter could see his grandmother coming towards him. After she walked away, he knew that his cheeks would be sore for days.” To understand the last sentence, readers must generate the inference that Walter’s grandmother pinched his cheeks. When comprehenders encounter such a gap in understanding (i.e., coherence break), they need to connect information about the causes and consequences to the text events (i.e., why his cheeks would be sore for days). As stated by some scholars (Graesser et al., 1994; Van Den Broek, 1990: 423-445), comprehenders in such cases need to generate bridging inferences (also known as backward inferences) to establish a coherent representation of a text, although the representatives of the behavioral research (Just and Carpenter, 1992: 122-149; Mckoon and Ratcliff, 1992: 440-466; Singer et al., 1992; Linderholm and Van Den Broek 2002) have shown that causal constraint of a text and the working memory (WM) capacity of a reader both separately influence bridging inference generation, there is still much to do in terms of examining the relation between WM capacity, causal constraint, and brain activity associated with drawing bridging inferences (Virtue et al., 2006: 104-114) e.g., specific predictions can be made with regard to how WM capacity and causal constraint interact during the generation of bridging inferences. Because high WM comprehenders can store and access additional semantic information, they are able to simultaneously carry out several cognitive processes during the comprehension of a text (e.g., semantic integration and selection) which may not be possible by low VM comprehenders, and these additional processes are evident for highly predictable inferences, as comprehenders are to generate inferences under highly predictable text conditions (Van Den Broek, 1990: 423-445).

It has also been widely accepted that many of the thinking processes involved in comprehension, such as integration and inference, anaphoric processing, use of context cues, selective and focused attention, monitoring comprehension, and structuring of narratives as well as examples from other genres, are dependent on the storage and organization of information in memory (Cain and Oakhill, 2007: 41-75; Bender, 2008; Archibald and Gathercole, 2007: 919-924; Wooley, 2011: 1384-1398). For Frank et al., (2003: 875-910), an inference model during story comprehension is presented in a high-dimensional situation-state space which organizes itself on the basis of a constructed micro world description. And a story taking place in the micro world corresponds to a trajectory through this situation state space. During inferencing, the world knowledge is applied to the story trajectory, which, as a result

of integration with it, adjusts it to reflect the inference of propositions that are likely to be the case. Although, in such cases, as Frank et al, (2003: 875) emphasize, inferences do not result from a search for coherence, and they do cause story coherence to increase. Most facts in a narrative text are usually left implicit and many should be inferred from the text. For instance, from the short story "Bob was riding his bicycle. He hit the coffee table"; it might be inferred that Bob was riding his bicycle indoors, which explains the fact that he could hit a coffee table. Since being outdoors is consistent with hitting a coffee, adding the inference increases the story's coherence. The inference requires the common knowledge that tables are usually found inside house and that Bob had to be at the same place as the coffee table in order to hit it. (Frank et al., *ibid*: 876). Proceeding from the assumption "item rarely belongs to a single category, but can be cross-classified into many categories" Nguyen and Chevalier (2015: 138) claim that a person, for example, can potentially belong to several categories with different bases (e.g., gender, occupation, hobbies, etc.) (cf: Baron et al., 2014); Shutts et al., (2013: 35–62) as a result of which, each of these bases can lead to very different inferences about the person, and subsequently affect interactions with that person. Therefore, cross-classification raises a number of questions about both our inductive reasoning and inferencing. For example, using cross-classified job and hobby categories, Patalano et al., (2006: 407-424) operationalized coherence as the extent to which category members share causal features that give rise to surface level features, such as uniformity in behaviors. These researchers found that adults tend to use the high coherence category more often than the low coherence category to make inferences about people who could be cross-classified into both categories. For instance, in Nguyen and Chevalier (2015: 137-150), adults were told that the majority of feminists (high coherence) prefer the opposite. When asked to predict the drink preferences of someone belonging to both categories, a feminist supporter who is a waiter, made predictions consistent with the high category (predicting a preference for cake) (Nguyen and Chevalier, *ibid*: 138-139).

This fact by all means enhances the fact that research from the conceptually specified genres of literature has yet to be investigated to shed light on how category coherence might play a role in the induction of cross-classified inferences. Thus, below analyzing examples from a story-genre is imperative to clarify to what extent (a) inference generation in this plays a significant but a different role in establishing textual coherence; (b) reader's relevant background knowledge is activated, and (c) a subset of implicit text information is encoded in the holistic text representation.

How Inferencing Provides Coherence in Narrative Texts

A growing literature of recent research has suggested that inferencing provides coherence in different genres in different ways and in order to from an unavoidably common and divergent features of such texts, a reader must be able to join the information presented in the text with his/her background knowledge to construe the meaning that may not be explicitly stated, through the generation of inferences. In this study, before passing to the process of inference making in narratives, we think it reasonable to briefly outline the "intersection" and seemingly "negative connotation" of story-telling with science communication in terms of both functional and constructive aspects. Although storytelling often has negative connotations within science, narrative formats of communication can hardly be disregarded/ignored when communicating science to the non-expert representatives. Dahlstrom (2014: 13614) claims that as narratives usually offer increased comprehension, interest and engagement, non-experts get most of their science information from mass media content, which itself already biased toward narrative formats. More than that, science communicator's tactics for persuading otherwise resistant audiences, in turn, raise ethical considerations. Other possible intersections and divergences of narratives with the other genres are suggested in terms of inference making and context relatedness. As narratives are easier to comprehend and audiences find them more engaging than traditional logic-scientific communication (Bruner 1986: 56-134; Green, 2006: 163-183), the sources from which non-experts receive most of their science information are already biased toward narrative formats of communication and as some scholars point, non-expert audiences get the majority of their scientific

information from the mass media content (National Science Board, 2012). Because media practitioners have to compete for the attention of their audiences, they routinely rely on stories, anecdotes, and other narrative formats to cut through the information clutter and resonate with their audiences of reaching and engaging with a non-expert audience (Dahlstrom, 2014: 13614). The challenge for science communicators, then, is to decide when and how narratives can effectively be helpful to them in communicating to non-experts about science. Accordingly, the purpose of this part is to (briefly) survey the basic features of narrative communication and explain this widely acknowledged assumption of narrative through the articulation of certain factors that distinguish narrative as an engaging communication format. What should be stated first is that narratives follow a particular structure that describes the cause-and-effect relationships between events that take place over a particular time period that impact particular character (Dahlstrom 2014: 13614). Although scholars can use more nuanced factors to further determine the narrativity of a message (Gilbert, et al., 2005: 535-563; Osberne, et al., 2009: 1683-1707; Kreuter, et al., 2007: 221-235), these three influential factors of causality, temporality, and character represent a fairly standard definition of narrative communication. Such a definition suggests that narratives can be present within almost any communication activity or media platform. Obvious examples include interpersonal conversation, entertainment TV programs, and news profiles, but narratives can also present themselves within larger messages as testimonials, exemplars, case studies, or eye witness accounts. In spite of their sharing definite common and divergent features with argumentative, descriptive, deductive and even statistical communication format's (as stated above), more generally narratives are often contrasted with the logico-scientific prose functional styles in their direction of generalizability, their reliance on context, and their standards for legitimacy (Dahlstrom (2014: 13614). Narrative communication provides a specific case from which an individual can generalize up to infer what the general truths must be to permit such a specific to occur (cf; Bruner, 1986: 222), Zabrocky and Moore, (1999: 691-710). The other major difference lies in the fact that the utilization of logico-scientific information follows deductive reasoning, whereas the utilization of narrative information follows the inductive reasoning; logico-scientific communication is context free in that it deals with the understanding of facts that retain their meaning independently from their surrounding units of information and, representing the meaningful unit of content; these facts, can be exercised from a larger message and inserted into other messages without damaging the general environment, or even presented alone, with little loss of understanding. In contrast, narrative communication is context-dependent because it derives its meaning from the ongoing cause-and effect structure of the temporal events of which it is comprised (Trabasso and Sperry, 1985: 595-611; Dahlstrom, 2010: 857-875; Dahlstrom, 2012: 303-326). As such, it is much harder to break narrative into smaller units of meaningful content without either greatly altering the understanding of the smaller unit or rendering the original narrative incoherent (Bruner, 1986). Finally, while logico-scientific communication aims to provide logical truths as an outcome and the legitimacy of its message is judged on the accuracy of its claims, narrative communication, in contrast, aims to provide a reasonable depiction of individual experiences and the legitimacy of its message is judged on the truthfulness of its situations. This difference, in turn, confusingly allows logico-semantic communication and narrative communication with opposing outcomes to be judged with equal levels of "truth", and partially explains, why narratives can rarely be effectively countered with facts (Kreiwirth, 1992: 629-675). Such differences enable us to claim that logico-scientific and narrative communication are not just contrasting formats of communication; they represent two distinct cognitive pathways of comprehension. (Bruner, 1986: 222; Monteagudo-Gonzalez, 2011: 295-302; Fisher, 1984: 1-22). The paradigmatic pathway controls the encoding of situational/contextual exemplars, leading to distinct differences in comprehension and processing based on the appropriate pathways used to provide the content. (Dahlstrom, 2014: 13615). Supporting such a categorical difference between the mentioned pathways of communication, empirical studies suggest that narrative processing is generally more efficient, since it is often associated with increased recall, ease of comprehension, and shorter reading

times (Zabrucky and Moore, 1999: 691-710; Schank and Abelson, 1995: 1-86). Graesser and Ottati (1995) claim that narratives have a 'privileged status' in human cognition. These benefits can hardly come from simplicity, as coherent narratives demand a high level of complexity in both internal construction and alignment to cultural and social expectancies (Monteagudo-Gonzalez 2011:295-302; Graesser and Ottati, 1995: 121-132). As Bruner (1991: 1-21) states, narratives offer intrinsic benefits in each of the four main steps of processing information; motivation and interest, allocating cognitive resources, elaboration, and transfer into long-term memory; accordingly, narrative cognition adjusts structure to reality and serves as the underlying foundation for memory and this reliance, as some scholars state (Schank and Abelson, 1995: 186; Oatley, 1999: 101-117), is the result of an evolutionary benefit because narratives provide their users with a format of comprehension to simulate possible realities, which, in turn, serves to better predict cause-and-effect relationships and model the thoughts of other humans in the complex social interaction that define our species (Read and Miller, 1995: 139-152).

Persuasive narratives stem from their describing a particular experience rather than general truths; accordingly, narratives do not need to justify the accuracy of their claims since the story itself demonstrates the claim. Similarly, the structure of narrative links its events into cause-and-effect relationship to make the conclusion of the narrative seem inevitable even though many possibilities could have happened (Curtis 1994: 419-61). This inevitability, in spite of the lack of justification, supports the many normative elements with a story-what is good, what is bad-without ever clearly articulating or defending blaming them (Dahlstrom 2014: 13616). As narratives are able to provide values to the real world objects/phenomena without argument, it is difficult to counter their claims. Narrative persuasion, in turn, examines how audiences accept normative views presented in a narrative and the underlying mechanisms that facilitate such persuasion. Results generally suggest the audiences are more willing to accept normative evaluation from narratives than from more logico-scientific arguments (Green and Brock 2000: 701-721; Slater and Rouner, (2002; 173-191). More than that, the world of a narrative uses enough emotional and cognitive resources because it is difficult for audiences to generate counter-arguments against the evaluation to which they are exposed (Green, 2006: 163-183; Green and Brock, 2000: 701-721). Gibson and Zillman, (1994: 603-624), claim that even when narrative and statistical information are both present within a single message, such as in a news story that describes an overall phenomenon but then also provides specific cases as examples, perceptions suddenly change direction toward the experience of the specific cases regardless of whether the overall evaluations align or not. In accord with the claim that "comprehension involves the interaction of multiple systems" (Cohn, 2014:1), "there is wide agreement that text comprehension results in multiple levels of representation or codes" (Mih and Mih, 2008: 39). For Van Dijk and Kintsch (1983); these levels, in turn, include the representations of surface form; of the idea network, or 'text-base,' and of the situations to which the text refers.

Accordingly, to understand a text, a reader must use more than the individual words on a page. Readers integrate knowledge in long-term memory with the written message to form a unified, coherent representation of text (Graesser, Singer and Trabasso, 1994; Mckoon and Ratcliff, 1992). Language, as stated above, is only one such code, others being imagery, direct procedural representations, episodic representations, emotion, and soon. These representations, in turn, can hierarchically be embedded, within one another or recorded to another form of representation to account for the complexity of the thought. The brief characterization of the three levels of text comprehension is as follows:

a) Verbatim text information or surface code is a record of the exact wording and syntax of the sentences. This level provides information which is remembered easily and exactly as given (e.g., the names of characters or places in story).

b) The propositional text base is assumed to be composed of a predicate plus its arguments (including the elements of the syntactic level such as subject, objects and complement) in the manner of

case grammar. The text base is preserved in memory much longer than knowledge provided by the surface code level of text representation. A propositional Schema, accepted as the unit of thought, is implemented as a device for forming emergent scripts. The theory argues that prior knowledge structure like scripts, are inflexible and insensitive to the context while a predicate-argument schema is not limiting and can be constructed online.

c) **The so-called 'situation model'**, for Perring and Kintsch (1985) could take the form of either a well-integrated text base or mental image. Containing causal chains of events, the construction of an adequate situation model requires a sufficient amount of world knowledge and enhanced by such an enriched knowledge-based factors, the situation model is retained in memory much longer than both the text base and the surface code, assuming that comprehenders has adequate world knowledge to build a situation model (Graesser et al., 2002) while Kintsch (1988: 163-182) went further dealing more deeply with prior knowledge use as a result of the theory was modified into a two-stage construction integration model denoted as C.I theory is initially bottom-up without priming (i.e., it is not an interactive theory), prediction, or any inferential top-down effects from prior knowledge (Mih and Mih, 2008: 39). Comprehending a text is a cognitive act due to which we perceive and discriminate, analyze patterns, make tentative interpretations, predict outcomes, resolve uncertainties, appreciate and perform other cognitive acts in material that is not in text form as well as in material that is in text form. That is, situation model allows readers to understand things that are not explicitly stated in the text for which readers should draw inferences about the relation between events or the spatial relations between objects. The following example serves to illustrate this point: ice cream is one of the most favorite snacks in the summer. People like to keep themselves cool when temperatures are high (adapted from Mulder, 2008: 9). Although this text does not contain any explicitly expressed connecting devices and elements, the two sentences are only related to each other by means of implicit links between the concept (e.g., 'high temperatures' and 'summer', on the one hand, and 'ice cream' and 'cool' on the other); the information in the second sentence can be interpreted as an explanation for the fact that "ice-cream is one of the most popular snacks in the summer" as well as "people keep themselves cool by eating ice cream". In other words, the two sentences of the text are consistent with an interpretation in terms of a consequence-cause relation. To illustrate the relevance of the implicit coherence, the connective "because" could have been used to make this relation explicit as seen from the revised version of the mentioned text: "ice cream is one of the most favorite snacks in the summer because people like to keep themselves cool when the temperatures are high". In both cases, the representation of the suggested text will be a coherent structure in which explicit textual information is interconnected and also integrated with the background inferred knowledge (Kintsch, 1988: 1998). The knowledge-based inference process in the text above has been decisive in establishing the connections between text elements as well as between the text and background knowledge (cf. Graesser et al., 1994; Mckoon and Ratcliff, 1992; Singer, 1990, 1994: 479-515; Van den Broek, 1994 and many others). The focus of the analysis of the suggested short story is on a cognitive account of contribution of knowledge-based inferences in the interpretation of causal coherence relations.

Given the task of this section, the question now is: at what level of representation is (causal) coherence relations expressed? We assume (in line with Sanders et al., 1993: 93-133, section 1) that coherence relations are part of the meaning representation of the text. For Mulder (2008:15), coherence relations are not part of the surface code (representation), but are represented either at the text base, the situation model or both. Trabasso and van den Broek, (1985: 612-630) suppose that during the reading of the first sentences of a story the reader constructs a hypothetical world based on the characteristics of the hero, the place, and the time, which, in turn establishes a set of circumstances in the light of which the subsequent events will be interpreted. The possible world will change as causal changes occur, and this is why causal inferences are so important. Making these inferences, therefore, is central to the "causal inference marker" model (van den Broek, 1990: 423-445). As some scholar's state, knowledge-

based inferences are pieces of information that are derived from background knowledge and that are encoded in the cognitive representation of the text (Mckoon and Ratciff, 1992; Graesser et al., 1994; Singer, 1994; van den Broek, 1994: 539-588.) Researchers also agree that information that is not explicit driven in the text but is actually encoded in the representation is considered to be an inference. Some inferences contribute to the coherence of the representation, whereas others contribute to the completeness of the representation. (Cozijn, 2000; Noordman and Vonk, 1992: 373-391; Singer, 1988: 177-219) and thus elaborate or enrich the representation which is solely based on the explicit information in the text. In general, as Singer (1994: 479-515) and van den Broek (1994. 539-588) claim, inferences necessary for the coherence of the text representation are made consistently. For the present purposes, an important distinction is one between the three types of knowledge-based inferences in terms of their meaning encoding function: intrasentential inferencing, intersentential or sentence connecting inferencing and extratextual inferences (Rzayev, 2017: 3; cf. also Graesser et al., 1995: 1-28). Intrasentential inference functions a means of contact between the elements of a current clause /sentence and background knowledge are the result of which emerges knowledge-based inference e.g. "It took the soldier only a few day for his flesh wounds to heal." The sentential inferences (arising as a result of the link between the sentence elements: took the soldier a few days, "for his flesh wounds to heal" and the prior knowledge) in this case are as follows:

- a) The soldier had received wounds
- b) The soldier's wounds had not cut the skin very deeply, and
- c) The soldier got well after a few days' treatment.

We can hardly maintain that the results on one intrasentential inference making (as in the sentence above) license drawing the same conclusions for the following example: "It will take much longer for the mental wounds to heal." Our prior or background knowledge, resting on our own or even our ancestors; life experience, gives rise to the inference below: a) One can suffer not only from a bullet wound, but also when (i) one is wounded to her pride and even (ii) somebody, 'rubbing salt into/opening old wounds' reminds one of unpleasant things that happened in the past; b). The mental wounds are caused by getting denigrated/betrayed or despised and can hardly be cured by undergoing therapy. If each of us had not constructed/inferred these levels of representation, the differential influence of coherence (coming from life experience!) on the conceptual and situation model would not have been detected. However, there are several problems with the methodology that was used and is still being used in the recognition of the potential of an 'intrasentential' inference in terms of its providing the so-called causal coherence relations (as in the example about with mental wounds-the reason of their lasting much longer is associated with one more cause, i.e., they are not weapon wounds to be cured by doctor's operations) e.g., the first problem is that several authors have manipulated cohesive devices with causal coherence relations (Kamalski, 2007, Sanders and Noordman, 2000: 37-60). This means that although the cohesive links can function (and in definite cases even 'support' the coherence relations), side by side with coherence relations, they are completely different both in terms of their recurrent use and restricted (i.e., intrasentential or intertextual) effects on the external factors as well as incapability of bringing together semantically discrete units of language, what, in fact, the "functional life" of language is due to. The second problem with the McNamara and Kintsch, (1996: 247-288) study is that they made their judgments on the basis of only one experimental text as a result of which, both the validity of external and internal factors is under dispute. Ignorance of the external validity of the intrasentential inferencing makes it impossible to shed light on how this particular individual sentence-text behaves under different conditions, instead of a possible effect of different cultural traditional or conventional manipulations that are not restricted to the surface structure of the actual text. This, accordingly, leads to problems with the cause-effect relationship-based coherence which demonstrates to what extent external and internal validities are interconnected. Consider the following analogy: I. Rosenberg (a representative of the Georgian trend in poetry) claims that "there is no winner in a war" in his poem "Break of the day in

Trenchesé (published in 1979). When asked for an argument to support this claim, Rosenberg goes in line with Bullough's (1941: 46) idea that a scholarly tradition not only recovers, but also improves old themes and forms, which, in turn goes back to Shakespearean times emphasizing the "outlooks" of some of the everlasting poets of English literature (such as Milton, Coleridge and Tennyson), on the one hand, and human life should take its inspiration 'from pastoral standards and truths! Which speak of the ordinary rural landscapes and moral values of life, on the other. It is unlikely that everybody in this world would seriously accept this generalized claim on the basis of Rosenberg's this particular argument. Such kind of generalizations (which can hardly be falsified by anyone) can hold true for only undeniably true phenomena and scientific facts such as "the sun rises in the east and sets in the west" or "The history of English writings began with the seventh century of our era" we can hardly deny that the inferencing results on these sentence-texts license drawing such general conclusion (e.g. The sun in the past rose in the east and set in the west /The sun in the future will rise in the east and set in the west-if to ignore the extended nature of the present simple: or "The first runic-based writings of English appeared only two hundred years after the origin of the spoken English language" and "The earliest written records (the franks Casket and a short text on a stone in Dumfries shire near the village of Ruth well known as Ruth well cross" date back to the 7th century Northumbrian dialect). The methodological problem facing us in identification of how different levels and their interrelationships contribute to inference making, establishes the so-called intersentential-text coherence. The question is: How does it happen? Its hierarchical "steps" can be imagined as follows:

1. An intersentential inference may be identified through establishing a causal link between explicit statements in the text;

2. Establishing the (causal) coherence relation between sentences (applying both intransentential and extra sentential or background information) enables us to make an intersentential connecting inference. E.g. "once upon a time, there was a farmer who was very lazy and hated his work. His wife yelled at him so much that he went to the market to escape (Example from Miller and Cohen, 2001: 134). When reading these sentences, one can build a bridge between these sentences through making an inference, which establishes a causal coherence relationship and we can interpret it as: "His wife yelled at him because of his laziness and hating to work". Thus, this intersentential inference amounts to recognizing that the events described in the first sentence and the first clause of the second sentence are causally related and the roles of both the semantic and intersentential as well as the background knowledge ("How otherwise can a wife of such a lazy husband treat him?"- the answer is known to everybody from our life experience jointly contribute to the causal link between the represented meanings of the sentences and a tentative interpretation of the interclausal events of the 2nd sentence orients our attention to one more fact: the events in these clauses are also causally related. But although there is a direct causal link between the events ("His wife yelled at him so much" and "he went to the market to escape"), the causal connection between the clauses has been enhanced by the inference "He could not stand his wife's yelling him so much and decided to escape." What it means is: the above mentioned causal connection between the events does not suffice to establish the complete picture of the intersentential connecting inferences, since the causal interpretation of the events in the second sentence requires the reader to infer the additional event: He could not stand his wife's yelling at him anymore and decided... or he saw no other way but escape. This additional information is not explicitly mentioned in the text and is constructed/inferred by the reader on the basis of his conventional background knowledge. The combination of this additional information and the explicitly provided information explains why the event in the second part of the second sentence takes place. In other words, both inferred information (supplied by the background knowledge in terms of the connectedness of the first sentence and the 1st clause of the second sentence as well as interclausal connections, in the second sentence) and the explicitly stated semantic connections are antecedents of the consequences described in the second sentence ("His wife's yelling at him" as the consequence of his

being so lazy and hating to work" while it functions as the cause leading to his making a decision to escape which, which, in turn, is the consequence of the mentioned causal relationship). The inferred extra information can therefore be regarded both as a causal antecedent inference (Graesser et al., 1995; Singer, 1994; van den Broek, 1994). But all the inferences made during comprehending the above mentioned intrasentential and intersentential-based cases share one common feature: all these inferences establish coherence and it is by virtue of these inferences that explicit statements in the text are connected in the representation.

The analysis of the story below focuses on specifying the condition under which readers may go further than suggested component level and reach complex coherence (both semantic and emotion) representations. Following from the constant interaction between the suggested text and the reader's general knowledge, text comprehension draws relevant inferences as to maintain coherence. All the models of text comprehension agree on the role played by the information transmitted in the text as a source of text processing since it is the formation in the text as a source of text processing since it is the information in the text that associates information in the reader's knowledge stored in long term-memory. As the text is processed, the activation of different concepts in the text itself and consequently in the reader's memory fluctuates (Graesser et al., 1994). According to the constructionist view of text comprehension, a search-after-meaning process depends on the following three main assumptions:

Assumption one concerns the reader's goal (e.g., entertainment or aesthetic pleasure, learning, etc.) and may vary depending on the text genre or on the task e.g. one can read a text in order to find out the main idea or briefly summarize it afterwards or perform a knowledge acquisition task. The second assumption states that readers are motivated to construct a mental cognitive model that reaches coherence at both local and global levels. Coherence on the local level is achieved by connecting close constituents of the text whereas coherence on the global level requires the connection of distant constituents of the text and depends on deeper features (Gygax et al., 2013:19) e.g., by tracking the central theme of the above mentioned intersentential level of the narrative ("the farmer's wife's yelling at him because of his laziness...") and knowing that they are confronted with a fairy-tale, readers are able to connect the different pieces of information presented in the text. Inferring that "the farmer got offended and decided to escape" is an additional causal consequence which is considered as a way to achieve coherence within a framework which can enable readers to understand subsequent actions and events (Graesser et al., 1994). The third assumption is concerned with the reader's need to constantly try to make sense of the different information transmitted in the text via the use of 'why-questions'. Readers are therefore considered actively involved in the search-after-meaning process.

Little Red Riding Hood (Taken from J. Miller and R.F. Cohen, 2001: 126-27-Reason to write. Low intermediate, OUP Adapted from the Grimm Brother's story) Once upon a time there was a sweet little girl who was loved by all who knew her. One day her mother told her to take some cakes and wine to her grandmother's house in the woods, but not to leave the path. That was too dangerous. As little red Riding Hood did not know what a wicked animal the wolf was, so she was not afraid of him. She told the wolf all about her grandmother and where she lived. The wolf said. "Look at all the pretty flowers, Red Riding Hood. You don't even stop to hear the birds sing ...and see the sunlight dancing through the trees and all the bright flowers." While little Red Riding Hood was picking flowers, the wolf entered her grandmother's house and ate her up. He dressed in the grandmother's nightgown and nightcap and got into bed. When little Red Riding Hood got to her: grandmother's house, she was surprised to see that the door was open. Everything seemed so strange. Even her grandmother looked very odd "Oh, Grandmother", she said, "What big ears you have." "The better to hear you with, my dear", said the wolf. "Grandmother, what big eyes you have." "The better to see with" "Grandmother, what big teeth you have. "The better to eat you with! And the wolf sprang out of bed and swallowed up little Riding Hood. When the wolf satisfied himself, he fell asleep and snored very loudly. A huntsman went past the house and hearing the loud snores, he decided to check on the old woman, when the hunter saw the wolf, he took

his knife and cut out open the wolf's stomach. Little Red Riding Hood and her grandmother jumped out. The wolf was dead and little red riding Hood thought to herself, "My mother was right. I will never again go off forest path when she tells me not to." And everyone lived happily ever after," This fairy-tale, as entertainment (for our children) plays an important role in their social and leisure times. Fairy-tales are also used in education and training contexts to motivate and to illustrate. One reason for this is that cognitive structures the story tellers use to have our children to understand the world around them are similar to the cognitive structures the story tellers use to have our children to understand the world around them (cf: Bruner, 1990). Or children's understanding of the world is achieved by a storyteller's "constructing reality" as a sequence of emotionally related events from our senses (Bruner, 1991). Riedl (2004: 4) goes further in stating that "the cognitive process of structuring events enables one to extract meaning from changes in the world and make inferences about the future." In fact, the story tellers understand the worlds by telling our children stories about how our world has been/can be changed and thus they become the witnesses (and even participants) of these changes in the world around. This way of representation of memory, thought and behavior (of the images) has evolved from the social nature of our species because fairy tales are a highly efficient and natural way to communicate (Dautenhahn 2003: 63-90). Children find it easier to understand the events in the fairy tales through cause and effect, accordingly, they understand the intentional behavior of the images through "why" factors which in turn, function as sophisticated interpretation of a narrative (Bruner, 1990; Sengers, 2000: 1-26). The other goal of storytellers is to help our children understand and predict (human) behavior (of the images) as a process of conscious decision-making. Given such an important role of fairy tales in our children's experience, the storyteller's another goal is to replicate our children's cognitive ability as a way of solving possible problems which can faced with in our social life. Thus, as Nicolopoulou (2008: 311) argues, in constructing their own narratives, the children draw themes, characters, images, plots and other elements from each other's stories; they also incorporate elements into their narratives/fairy tales from a wide range of other sources including other fairy tales, children's books, TV and their own experience. How does the analysis of this fairy tale bear on the revealing of the inferential narrative coherence? At the core of this fairy tale is a distinctive framework characterized by paradigmatic images of social relationships (a careful attitude of the family to their grandmother, the kind-heartedness and simplicity of the little sweet girl, a canny and pitiless wolf, and the attentive hunters) of these images in terms of their distinctive narrative purposes and concerns. Another specific feature of this genre is usually marked by distinctive modes of coherence, along with distinctive strategies for achieving them which necessarily integrate the depiction and coordination of events with the depiction and coordination of characters and relations between characters. It is these constitutive narrative models that we will try to concentrate on as a narrative framework that offers distinctive possibilities for considering not only the links between the "Behavioral trajectories" of the core images; more than that, the behaviors of the images also become predominant due to prominence of the unignorably emotional reflections, thus making the events more dynamic and colorful.

The first and foremost, the family framework allows us to understand a mode of an 'inherited moral heritage' i.e., continuity of the "respect, care and love" for the family elders across generations. Therefore, the very first sentences use of "a sweet little girl" means much more than the mere literal meanings of the three words suggest, because the people around her (especially those aged people who were well-aware of the girls' love and respect for her grandmother) loved her. This interrelationship", in turn, stems from the little girl's mother's love for her own mother who lived in the woods and being old and sick, could not make a meal for herself. Therefore, the first paragraph (with its three sentences) generates (and is built on) the following inferences;

1. The little girl loved (and respected) not only her grandmother, but all the aged people around her;

2. She had grown up in a family where love and respect were continuously inherited from generation to generation;
3. The little girl's mother prepared a basket full of some cakes (she had cooked cakes) and wine
4. The grandmother lived in her house in the woods alone.
5. Mother instructed her girl how to go to the grandmother's house not to meet any dangerous animal (which lived in the woods).

Consider some interesting features of the story: although the story speaks about only two members of the family, they, in fact, give the whole picture of the family relationships and these two images are integrated into the story by the so-called inclusion from the intra-family relationships. We also think that there is no question that the story is coherent—that is, it hangs together (no matter explicitly or implicitly) in a comprehensible and meaningful way. But the coherence between paragraphs 1 and 2 is clearly not achieved by connecting the chain of events in the story to the goal directed action (the little girl's going to her grandmother/the wolf's learning the place of the grandmother and reaching there before the girl). Nor are the different events related in a temporarily rational way; that is, although paragraph 2 has been unnecessarily expanded on an account of her remembering mother's words and a detailed description of the forest, there is a deeper (hidden) logic to the sequences of the events portrayed, but in light of the cause-effect happenings of the events, "the connections between the events are not simply" in sense of each event causing the next. There are certainly causal linkages between some of the events (the wolf's words "look at all the pretty flowers... You don't even stop to hear the birds sing. You are as serious as if you were going to school"). There are certainly "causal" linkages (the inference 'I see you are in such a hurry that...') between the vents but by themselves (only on the basis of their realized surface levels) these cause-and-effect linkages are not sufficient to account for the global coherence of the story. Rather, the events are connected by being embedded in an overall framework of family relationships (paragraph 1), while in paragraph two, main concerns are the canonical temporal rhythms of the events and transformations of the little girl's mood and her being involved in unplanned acts (spending time on picking flowers which allowed the wolf to get to the grandmother's place and eat her up) that give each of the grand events an appropriate place. In short, the main reason that this story is not merely a random sequence of events is that it refers back to paradigmatic sequences of events that are embedded in a certain specific framework of goal-oriented relationships of the little girl and the wolf. And it is this core reason/cause that provides the underlying foundation from which the coherence of the story is generated. The interparagraph (and intrapagraph) relations also offer specific possibilities for narrative elaboration and development, by which the increasing complexity (e.g., the wolf's persuading the girl to play with the flowers around and thus waste of time, etc; or the wolf's dressing in the grandmother's nightgown and nightcap and getting into her bed, etc.) is achieved through maintaining the coherence of the story. E.g., over time the little girl got for her grandmother's house, she found the door open (what surprised her greatly) and the strangeness of everything including the changes in her grandmother's appearance forced her to generate increasing emotional patterns of utterances individualizing each strangeness without leaving any of them unmentioned. As a key starting point for such "favoring" of these strangeness was a sharply different picture of everything in the appearance of the "grandmother" and correspondingly, these unimaginable changes "motivating" each of her full-emotion questions include specific conflict centering on the comparison of the familiar look of grandmother and "her" present state which is completely different. Furthermore, the little girl used these questions to achieve content/stability/logical sequence and coherence in the framework of the observable changes in the grandmother's appearance.

We propose focusing on comprehension as an inferential elaboration, we might seem to be ignoring the role of emotions in responding to narrative. Our remaining blind to the emotional aspect of

the narrative and our objection to its role in comprehension would lead us to misunderstanding of how inquiry works.

Consider an analogy: people are often emotional when they speak, but it is legitimate and useful to have a theory of language that focuses on how language is structured for understanding, regardless of what emotions are summoned up by certain sentences. E.g., if a wife says to her husband, "pack up and get out". Different theories, as Bordwell states, pick out different features of the phenomena they try to explain. We usually focus only on comprehension, but it would not be an exaggeration if we grant that the content plane is only one aspect of our experience of narrative. Accordingly, we would claim that with respect to most narratives (as well as comedies, plays, conversations), comprehension must also play a role in emotional uptake. However, while explaining the emotions generated by narrative, one thing is unchallengeable: a large part of those emotions rely upon making basic sense of the story. If we are interested in how the little girl responds emotionally to the unrecognizably changed appearance of her grandmother, an account of comprehension would presumably contribute to a lot to our inquiry. Thus, proceeding from the assumption "a large part of those emotions generated by the little girl's narrative, rely upon making basic sense of the story," we can hardly understand the events that have led up to this climax in terms of the impact those events had upon the little girl to ask such questions rather rich in emotions. Even the symmetries of these question suggest that narration (and emotions), shifts in pint of view and commentary-fall under the rubric of narration. Both the dialog between the wolf and the little girl in paragraph 2 and the questions of the little girl and the wolf's answers play roles in larger patterns running across the entire story.

The following tables developed by Rzayev (2017: 7-8) demonstrate how text-connecting inference allow us to construct both goal hierarchic and sequential versions/models of inferences the events depict in the above mentioned story:

A. The Image-Specific Goal-Hierarchic Version

The little girl	The wolf
Main (general) goal: to take the basket with cakes and wine to her Grandmother	Main (general) goal: to eat both the grandmother and the little girl
Local goals:	Sub goals:
1) to avoid danger not to leave the path;	1) to learn the grandmother's place from the little girl and eat her up before the little girl reaches the place;
2) to pick up the flower for her grandmother.	To dress in the grandmother's nightgown and night cap; to eat up the little girl
3) to come back to her mother safe and sound.	

B. The Sequential Version of The Happenings

1. The existence of a lovely little girl.
2. Mother tells her to take some cakes and wine to her grandmother's house in the woods.
3. Mother warns her daughter of the possible danger and asks her not to leave the path.
4. Reaching the wood, the little girl is met by a wolf.
5. The wolf asks about the place the little girl goes to.
6. The girl, not knowing how wicked the wolf was, tells him about her grandmother and her place.
7. To reach the grandmother's place and to eat her before the little girl comes there, the wolf's draws attention of the little girl to the beautiful flowers;
8. The little girl spent some time on picking up flowers for her grandmother.

9. During all this time the wolf found the grandmother's place and ate her up.
10. Then, the wolf, not to arouse the little girl's suspicion, dressed in the grandmother's wearing and got into her bed.
11. The little girl got to the grandmother's house.
12. She got surprised at seeing the open door.
13. Everything in the room looked strange.
14. The grandmother also looked very odd.
15. She wanted to be understood why her grandmother looked so strange and asked appropriate questions.
16. Each time the wolf answers her question in a strange way.
17. The little girl wanted to know why the grand-mother's teeth were so big.
18. The wolf answered 'the better to eat you with'.
19. The wolf sprang out of bed and swallowed up the little girl.
20. Fed up, the wolf fell asleep and snored very loudly.
21. A hunter, passing by the house, heard the loud snore.
22. He decided to check on the old women.
23. He sees the wolf and understanding the situation, cuts open the wolf's stomach with his knife.
24. The girl and grandmother jump out.
25. The little girl understood her mistake and promised never to go off the forest path.
26. Everyone lived happily after.

We also argue that this way of representing information (sequential version of the happenings) gives us some valuable insight into the way emotion inferences are constructed. More specifically, the questions beginning with 'what' with their context-adjusted forms, shed light onto emotion inferences. "Oh Grandmother, what big ears you have", from the point of form, it resembles an exclamatory sentence. But it comprises not only the little girl's emotional feelings. It contains more such as "why are your ears so big? What has happened to them? They were not so big", etc, additionally expressing her surprise, on the one hand, and fear, on the other. This fusion of feelings (emotional feelings arousing from deep satisfactions) is characteristic for the wolf's answer. The form of the wolf's answer "The better to hear you with, my dear" demonstrates not only satisfaction of the wolf, but it also reflects "how pleased he is". The form-content differences of these three adjacent pairs enrich the different pieces of information with the psychological state of the little girl: Inferring that the little girl is desperate (since she cannot believe her eyes and does not understand the case) may additionally be considered as a way to achieve the heightened coherence by offering a framework due to which one can understand subsequent events and emotions.

According to this factor (the girl's being at a loss and in need for explanation the cause of the situation), readers can easily make sense of the information and emotional feelings of the little girl via comparing her "emotion-filled "utterances and pleasure-full" answers of the wolf which contain different information from the one transmitted by the girl's utterances.

In summary, our inferential approach to text coherence using the aggregation of the text base and background information is compatible with the predictions of this constructionist theory's strategy in the sense that these components are able to modify the proper representation and adapt it to the shifts of context occurring in the text. This, in turn, suggests that a narrative intended to induce a certain emotion is compatible with different emotion labels to activate the different components of emotion needed to reach a specific emotion representation. In this sense, we share the viewpoint of those scholars who state that emotions are composed of different general dimensions, the number and the nature of which are variable but all models agree to include "evaluation pleasantness" and "activation-arousal" as

two essential dimensions (Fontane et al., 2007: 1050–1057; Ortony et al., 1988; Osgood et al., 1975; Russel, 1977: 273–294; Gillioz, 2013). The unexpected condition (the little girl's getting surprised at her grandmother appearance) is the stage of reading where the readers are likely to have entered the process of inference making.

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