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BETWEEN USAGE-BASED AND MEANINGFULLY-MOTIVATED GRAMMATICAL RULES: A PSYCHOLINGUISTIC BASIS OF APPLIED COGNITIVE GRAMMAR

Abstract

The aim of the article is to present a usage-based theory of second language acquisition (SLA) which might serve as a framework for explaining the learning mechanisms that are operating when students are exposed to the meaningfully-motivated Cognitive Grammar-based teaching materials. Currently, two seemingly quite different stands of Cognitive Grammar (CG) applications are advocated: one focusing on the use of meaningfully-motivated linguistic explanations and the other on the usage-based nature of language. The article outlines a unified psycholinguistic theory, inspired by Brian MacWhinney's Competition Model and developed by Nick C. Ellis, which is compatible with both the meaning-based and the usage-based conceptions of language assumed by CG, and which can provide a more fine-grained frame of reference for introducing Cognitive Grammar into the teaching practice. Finally, some suggestions are made concerning practical application of CG-inspired pedagogical rules that should enhance the effectiveness of meaningfully-motivated grammatical instruction.

1. Introduction

Since its rise in the 1980s, cognitive linguistics has seemed to be a well of new, interesting ways of thinking and talking about language. The feeling that cognitive explorations of language are much more unified and understandable than standard

accounts allowed to hypothesize that pedagogical rules based on cognitive linguistics are bound to be more appealing and, because of that, more effective than the rules traditionally used in textbooks and reference grammars (Dirven 1986; Taylor 1993). For the last thirty years, a great deal of journal articles and edited volumes have been published on pedagogical implications of Cognitive Grammar (e.g. Achard, Niemeier 2004; Boers, Lindstromberg 2006; De Knop, De Rycker 2008; Kristiansen et al. 2006; Lindstromberg 2008; Pütz et al. 2001a, 2001b). These publications, however, rarely place their pedagogical suggestions with in a single theory of second language acquisition. The present article is a modest attempt (as an in-depth analysis of the problem is certainly beyond the scope of an article) to bridge the gap between applied cognitive linguistics and some of the contemporary psycholinguistic theories of SLA – notably the emergentist theory, which is compatible with CG. More specifically, the purpose of this article is to investigate the ways and the conditions under which CG-inspired pedagogical rule formulations can be effective from a psycholinguistic perspective. First, I will present some of the claims often made by applied cognitive linguists in relation to L2 grammar teaching. Then, I will argue on the basis of the cognitive linguistic and contemporary emergentist theories of second language acquisition that the two seemingly contradictory approaches can be seen as complementary and, indeed, inseparable ways of ensuring L2 development. Lastly, I will give some suggestions concerning the most psycholinguistically justified implementation procedure of CG-based grammatical rules.

2. Meaningfully-motivated grammar

The cognitive linguistic movement's founding father, Ronald Langacker (2008: 66), indicated three basic features of CG that "suggest its potential utility as a basis of language instruction: the centrality of meaning, the meaningfulness of grammar, and its usage-based nature". The majority of studies devoted to the pedagogical implications of CG – especially the earliest ones – focus on the first two: the centrality of meaning and the meaningfulness of grammar.

The meaning-based nature of CG is one of the most distinctive features of this linguistic theory. One of Langacker's most fundamental claims is that all linguistic units, including grammatical morphemes, syntactic patterns and grammatical categories are symbolic units which build conceptualisations, i.e. mental images evoked in the language user's mind during language processing. A conceptualisation is composed of various pieces of information pertaining to the semantic content of a linguistic expression and to its particular construal, i.e. to the way this semantic content is conceived of. All linguistic units play a role and interact with one another in activating certain elements of the conceptualisation, and so contribute to and enrich the mental image with meaningful information. For example, the main role of most grammatical units (grammatical morphemes, syntactic patterns) is to shape the construal of the scene, i.e. to indicate the ways in which a particular image is viewed, especially with regard to the perspective taken (both in time and space) or

the level of specificity/generality (Langacker 1987). The assumption that all grammatical elements are meaningful distinguishes CG from other functional approaches to language, because forms are linked to their conceptual content, that is their meaning, and not merely to their functions:

> CL [cognitive linguistics] shares many of the assumptions of the more broadly defined functional linguistics, which sees the processing conditions for language performance, and the communicative goals and intentions of language users as shaping influences on language structure. CL seeks to go beyond these functional explanations of linguistic form to further explain how language mutually interfaces with conceptual structure (Ellis, Robinson 2008: 4).

The main argument quoted in favour of introducing CG into foreign language teaching rests on the premise that teaching grammar, by presenting students with the "conceptual content" of grammatical structures can be more illuminating, insightful and interesting than the traditional rules of grammar, where forms are arbitrarily linked to functions. The following citations put this argument very clearly:

> The function of a pedagogical grammar is to promote the learner's insight into the foreign language system. In essence, promoting insight means reducing the perceived arbitrariness of the foreign language system (…), we need to explain to the learner why the foreign language should be as it is (Taylor 1993: 219–220).

> CL is in line with modern strands of education-oriented applied linguistics and useful to second language pedagogy, especially because of its focus on the motivated, meaningful connections between forms that are often ignored by other theories of language (Verspoor, Tyler 2009: 160).

Because of the fact that applied cognitive linguists want to primarily explain to the students the conceptual, meaningful motivation behind forms, they often assume that this can be best achieved by explicit instruction, i.e. by direct metalinguistic explanations, or, at least, by raising students' awareness about the semantic motivations underlying grammar:

> Cognitive linguistics framework offers important contributions to second language pedagogy because the kinds of generalisations it posits to describe can easily be made explicit and thus incorporated into classroom practices (Achard, Niemeier 2004: 7).

> Both the theory and the specific descriptions of cognitive linguistics operate with the notion of "motivated learning" (in the forms of bodily and/or conceptual motivation). The assumptions concerning the potential usefulness of cognitive linguistics is predicated on the commonsensical belief that motivation always facilitates learning (Kövecses 2001: 87).

> Uncovering the iconic structure of language is closely linked with the concept of consciousness raising or language awareness (…) From a cognitive linguistics perspective, the idea of language awareness lies precisely in the pedagogic strategy of making the learner aware of the semantic impact of so-called symbolic units (Pütz 2007: 1145).

The quotes indicate a strong conviction that explicit metalinguistic and metacognitive knowledge (i.e. the conscious knowledge of how language works and how it is affected by other cognitive processes such as attention) can help learners in the process of language acquisition. The advantages of conscious effort put into explicit learning of the new material are well known both in the learning theory and learning practice, and are explained with the effects of an increased depth of processing: usually, the greater the conscious effort put into the integration of the new material (e.g. by thinking, talking about or writing the information down), the more deeply the information is processed, and so the more durable the storage and the faster and easier the retrieval (Ausabel 1963; Craik, Lockhart 1972). However, because of the fact that linguistic knowledge is ultimately implicit (i.e. retrieved with no conscious effort), language learning differs from other types of learning (e.g. learning facts about history, science or mathematics) in that it should in the long run enable automatic, effortless and unconscious retrieval of the learnt material.

The possibility of the explicit knowledge becoming independent of consciousness and "turning into" implicit knowledge is actually one of the most important – and most contentious – issues in SLA. For that reason, CG applications require a psycholinguistic background theory that could support the validity of their claims and provide a unified framework for making justified pedagogical implications. In particular, the theory should be able to explain the psycholinguistic mechanisms responsible for making meaningfully-motivated rules helpful. However, before I address this issue directly, I would like to present a different strand of applied cognitive linguistic implications, which focuses more on the usage-based nature of CG.

3. Usage-based grammar

3.1. Cognitive Grammar as a usage-based model

The specific approach to language and its analysis postulated by Cognitive Grammar is directly linked with the theory's underlying assumptions about language processing and language acquisition. In general, right from its beginnings in 1987, Langacker stressed that the CG theory is a usage-based model, i.e. an essentially empiricist model of language representation and acquisition in which all linguistic units and structures are believed to emerge from usage. In contrast to the Universal Grammar theory, Cognitive Grammar does not presuppose any inborn, language-specific acquisitional mechanisms or hard-wired syntactic principles, but tries to describe language development (both ontogenetic and phylogenetic) only in terms of an interaction between the operation of general human cognitive skills (such as perception or attention) and communicative needs. In this way, Langacker's cognitive linguistic theory shares its basic assumption concerning language acquisition with a more general contemporary movement in cognitive science called emergentism or connectionism. Below, I will briefly explain the fundamental assumptions underlying the emergentist – and so the usage-based – model, because they are highly relevant for the pedagogical implications of CG.

3.2. Emergentism

The emergentist model of language, which was first described in McClelland and Rumelhart's *Parallel Distributed Processing* in 1986, has been largely inspired by new evidence concerning brain functioning, which came to light with a more wide-spread use of the research methods investigating the brain involved in cognitive activity (such as MRI or ERP) and the possibility of simulating computationally the brain's processing in artificial neural networks. These developments inspired a range of theoretical models whose major attraction is the similarity between the structure and the operation of these models and the human brain. For that reason, the emergentist/connectionist models seem to be providing a more neurophysiologically plausible picture of the mental mechanisms responsible for language use and language acquisition.

In contrast to earlier cognitive conceptions of knowledge, which was viewed as being "stored" in the mind, McClelland and Rumelhart (1986: 267) made the claim that what we understand as knowledge (also linguistic knowledge) is not "stored" in the mind but rather generated "on-line" in the brain each time during language processing. From the emergentist perspective, linguistic units are defined as "recurrent patterns of mental (ultimately neural) activation" (Barlow, Kemmer 2000: XII):

> During linguistic processing, linguistic units are part and parcel of the system's processing activity: they exist as activation patterns. When no processing is occurring, the information represented by such units simply resides in patterns of connectivity (including differential connection strengths) resulting from previous activations (Barlow, Kemmer 2000: XII–XIII).

In this way, in emergentism, the traditional cognitive separation of the mind (compared to software) and the brain (compared to hardware) becomes removed, and the classical cognitive "concepts" or "mental representations of knowledge" are given neurological basis, which in many respects provides very illuminating and insightful new perspectives on the human cognitive structure and processing.

3.3. The emergence of linguistic units

In the usage-based/emergentist theory, the frequency of information processing is used to explain the point crucial in all language (especially L1) acquisition theories, i.e. the emergence of meaningful linguistic units that can be used accurately and adequately in appropriate contexts. Language units are broadly viewed as form-function (form-meaning) mappings which can refer to a string of words (continuous or discontinuous) that occur frequently together and, as a whole, convey a specific meaning or perform a particular communicative function (Ellis 2005). This conception matches Langacker's definition of a linguistic unit:

> [A unit is] a structure that a speaker has mastered quite thoroughly, to the extent that he can employ it in largely automatic fashion, without having to focus his attention specifically on its individual parts or their arrangement [constituting]

> a "prepackaged" assembly (…) it does not demand the constructive effort required for the creation of novel structures (…). Language is a structured inventory of linguistic units (Langacker 1987: 57).

Repeated processing of specific input data leads to the formation of associations between phonological forms of linguistic units on the one hand and objects, situations, events, etc. (generally all the information regularly accompanying the use of a given unit) on the other. All pieces of information associated with a unit correspond to the conceptualisation evoked by that unit, i.e. all of them are activated – although with different strength – when this unit is used.

An encounter with new input data requires establishing a new neural pathway (usually by making new connections to the already existing pathway) in order to process these data. Frequent processing of the same data increases the strength of the connection between nodes on a given path, which results in greater ease and speed of their activation. Impulses that occur rarely weaken the connections, which leads to a slower rate of subsequent processing or even to a processing failure due to the atrophy of certain connections.[1] In this view, learning the meanings of linguistic units (as well as their production and comprehension) is driven by the processes of association and prediction based on previous linguistic experience (Barlow, Kemmer 2000; Ellis 2005):

> Language acquisition is contingency learning, that is the gathering information about the relative frequencies of form-function mappings (…). Language learners are intuitive statisticians, weighing the likelihoods of interpretations and predicting which constructions are likely in the current context (Ellis 2006a: 1).

The implication of this account is that the acquisition of a new form-function association is directly related to the frequency of processing, which is ultimately linked with the frequency of occurrence of a particular form-function pairing in the input.

3.4. The emergence of "rules"

Another distinguishing feature of the emergentist/usage-based model is related to the model's view of linguistic rules, without which, apparently, no linguistic theory can do. However, it has to be emphasized that in CG "there are no 'rules' as such, although (…) there are plenty of generalisations" (Hudson 2008: 92). The conception of a rule that Hudson discards is that of a formal, meaningfully or functionally unmotivated formulation describing the mechanism of the language system. The emergentist 'rules' are not viewed as elements of an abstract, mathematic-like system, but rather as "patterns of language functioning" (Goldberg, Casenhiser 2008). Grammatical constructions are not the *sine qua non* of syntactic development of

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[1]   The strengthening or weakening of connections as a function of processing frequency corresponds to the neuro-chemical process of long-term potentiation, that is the enhancement of communication between neighbouring neurons due to frequent reactions at their synapses (Kolb, Whishaw 2003).

the L2 system (as it is predicted by the UG theory): the discovery and mastery of grammatical rules are neither the basis nor the ultimate goal of a language user's competence development.

On the other hand, it is a fact that making generalisations on the basis of our experience is a natural and highly helpful function of our brain/mind. Following familiar patterns or schemas facilitates processing and so it saves processing effort. For that reason, the neural network seems to be naturally predisposed towards recognising similarities and abstracting common features – the abilities underlying the processes of schematisation and categorisation, which give rise to schematic representations of knowledge such as prototypes, categories, concepts or syntactic patterns (Ellis 2005: 307).[2]

Schematisation – alongside categorisation – is present at all levels of language processing. At the lowest level, schematisation involves decontextualisation, i.e. disregarding the irrelevant – usually contextual – factors that do not recur consistently in usage events in which the unit is present.[3] Further levels of schematisation lead to the creation of grammatical constructions, which can also be formed at various levels of abstraction. The generalisations range form low-level constructions (e.g. the so-called slot-and-frame patterns) to progressively more abstract structures and grammatical categories.

3.5. Pedagogical implications and their limitations

The fundamental pedagogical implication of the usage-based model follows directly from the assumption that language acquisition crucially results from language processing. The most straightforward consequence of this view for L2 teaching is that exposure to input must be the necessary and sufficient condition for learning a language:

> [M]astering a language requires the specific, usage-based learning of a vast array of conventional units (…). It suggests the importance of providing the learner with sufficient exposure to representative uses of a given unit. Ideally, moreover, this exposure should occur in the context of meaningful exchanges approximating socially and culturally normal usage-events. In this respect, the usage-based approach resonates with the natural approach to language learning (Langacker 2008: 81).

As Langacker noticed, the method of L2 learning only by means of exposure to L2 data is not new in the history of L2 teaching methodology. The Natural Approach, made

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[2] It is important to bear in mind that in the usage-based account schemas do not exist in the network as separate, independent entities, but they are "immanent in their instantiations" (Tuggy 2007: 87), i.e. their activation involves the activation of certain specifications that are common among the individual instantiations. In other words, "abstract utterances without any phonetic and lexical content do not exist" (Barlow, Kemmer 2000: ix).

[3] It does not mean, however, that aspects of the context are absent from the semantic specifications of a unit. In principle, any recurring facet of the usage event – including some elements of the context – might "survive" the process of decontextualisation, and become part of the semantic specification of a unit (Langacker 1987: 63).

famous by Stephen Krashen,[4] focuses on the provision of the so-called comprehensible input, which is considered necessary and sufficient for mastering a language (Krashen 1985). Explicit grammar instruction and metalinguistic explanations in particular, are not believed to be helpful in fostering acquisition: according to Krashen, the explicit metalinguistic knowledge can only serve as a help in the conscious monitoring of one's performance, but it cannot "turn" into the automatic, implicit linguistic knowledge which underlies fluent communication. A similar view is held by Achard:

> CG-inspired grammar instruction will (…) not be metalinguistic. The purpose of grammatical instruction is to allow the learner to focus on the conditions that motivate specific structural choices. The most efficient way of achieving this goal is therefore not to explain those choices from the outside in a metalinguistic manner, but to illustrate them as much as possible. Since the rules are generalizations over specific instances, the best explanation for them consists in facilitating the recognition and access to the individual instances (Achard 2004: 180–181).

It is not difficult to notice that the above suggestions made by Langacker and Achard are clearly conflicting with the previously mentioned implications made by Dirven, Pütz and Taylor (section 2). It is striking that the idea of motivated-learning and explicit consciousness-raising which underlies the meaningfully-based applications of CG seems to be discredited and rejected by the advocates of the usage-based approach. The apparent discrepancy leads to important questions: Is it possible that Cognitive Grammar should lead to such distinct pedagogical implications? To what extent are such implications valid? Is the meaningful motivation of grammar at odds with its usage-based nature? And are the implications mutually exclusive indeed?

It seems that the crucial problem for applied cognitive linguists is to find such a justification for meaningfully-based grammar which would not belie the usage-based nature of language. In other words, a theoretical framework is needed that would allow to "fit in" explicit instruction on the meaningful motivation behind grammatical structures in a model which is essentially usage-based. Below I will try to show that this aim can be achieved if the model takes into account the specificity of L2 acquisition.

4. A usage-based model of SLA

4.1. Inadequacy of frequency-driven description of SLA

In spite of the neurolinguistic plausibility of the connectionist explanation of language acquisition and a great deal of empirical support found in L1 development data (e.g. by Lieven, Tomasello 2008), the majority of researchers working in the field of SLA point to a number of the model's shortcomings in accounting for L2, especially adult, acquisition. The major objection concerns the overemphasis of

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4   In fact, the Natural Approach to a great extent repeated the claims made in the 19th century by L. Sauveur (the Natural Method) and M. Berlitz (the Direct Method).

the role of frequency of processing. In particular, the commonly observed difficulties in acquiring some frequently-occurring forms (i.e. articles) or the instances of the so-called instantaneous (or "one shot") learning seem to belie the emergentist, frequency-based interpretation of L2 acquisition.

One of the most convincing evidence against the insufficiency of a purely usage-based account of SLA is provided by the descriptions of the L2 proficiency of naturalistic learners, i.e. learners, usually immigrants in a foreign country, who learn L2 through "immersion" in the L2 speaking community. Naturalistic learners receive plenty of input and often have to engage in meaningful communication with target language speakers, but, as reported in a number of studies (e.g. Schmidt 1984), in spite of years of exposure and practice in language production and comprehension, such learners fail to acquire the L2 grammatical system fully. For that reason, many SLA researches disprove also the alleged identity of processing and acquisition mechanisms: as has been indicated, connectionists assume that if frequency facilitates processing, it must also facilitate acquisition. As pointed out by Larsen-Freeman (2002), it is not always the case in SLA, where fluency development does not always run parallel to the development of the entire system (notably improvements in accuracy and complexity). And indeed, as admitted by Krashen himself "[t]he goal of the [natural] language classes is to bring the beginner to the point where he or she can go the country and obtain comprehensible input. It is important to point out that the goal of language classes is not to bring students to the highest level of competence" (Krashen 2003: 7). It is clear therefore that a purely usage-based account as outlined in section 3 cannot serve as a comprehensive framework for L2 development. Below, I will indicate how the usage-based model has been refined by Brian MacWhinney and Nick C. Ellis in order to accommodate some typical SLA phenomena.

4.2. Connectionist-cognitive solutions to SLA-specific problems

4.2.1. Cue competition

As defined in section 3.3, linguistic units in emergentism are understood as form-function mappings and their emergence in the linguistic system is attributed to a gradual process of establishing and strengthening associations between forms and functions. In order to make an association, a certain phonological form (cue) has to be linked with a specific interpretation (outcome): for instance, a verb inflection [-ed] in English has to become associated with past tense interpretation. The mechanism by which the connections between forms (cues) and their interpretations (outcomes) are discovered can be accounted for in terms of cue competition.

In the article "Language acquisition as rational contingency learning" Ellis (2006a) describes how the mechanism of making associations between cues and outcomes is viewed in standard associative learning theory and contemporary connectionist models. In particular, Ellis argues that it is not the absolute, bare frequency of the form in the linguistic data which determines the rate of the form's processing, but mainly the form's (cue's) reliability in correctly predicting a specific outcome (e.g. a proper interpretation of the message). This means that if a certain

cue is frequently unambiguously linked to a given outcome (i.e. the phonological form [dog] is, whenever encountered, linked with one specific interpretation), it becomes a highly reliable cue which can then successfully predict the particular interpretation on subsequent occasions.

The form-function associations in language are, however, usually highly complex and ambiguous. In particular, two situations are typically encountered: i) there is one cue linked to many different interpretations or, ii) there are multiple cues linked to a single outcome. The first case can be illustrated with the English suffix [-s], which serves as a cue guiding the following interpretations: i) plurality of a noun, ii) third person singular noun, iii) possessive case, iv) third person singular verb (Ellis 2006b: 167). In this case, the accurate cue-outcome mapping will be difficult to establish and the predicted interpretation of the suffix [-s] will be highly ambiguous and unreliable, as there will be many instances of a cue being present and the specific outcome (e.g. plurality) not pertaining.

The second case where making a proper cue-outcome association can be difficult as a result of ambiguity is when multiple cues are linked with one interpretation. MacWhinney's Competition Model (1987) was explicitly formulated as an account of how people learn to associate cues with outcomes in a situation when there are multiple cues available. The model uses statistic algorithms to simulate how people use cues which have the highest validity in order to arrive at the most probable interpretation. Initially in L1 acquisition, the order in which cues are acquired is predicted by a statistic called overall validity of a cue, which is determined by its availability (frequency or probability of occurrence), times its reliability (probability of correctly indicating the interpretation). Overall validity is computed using all sentences in the language and cue strengths are incremented proportionally to the ability of the cue to predict correct assignment. The later use of cues can be predicted by another statistic called conflict validity, which is computed for a cue using sentences in which the role assignment of that cue conflicts with the assignment of another cue; the cue strengths are incremented for sentences with conflicting cues only. In other words, the model first selects the most valid cue and then introduces cues on the basis of their potential to decrease error. The acquisition of cues predicted by the model is supported with some experiments (e.g. Matessa, Anderson 2000, quoted in Ellis 2006a), which showed that in the initial stages of acquisition learners tend to focus on only one cue at a time; later on, they add a second cue and use them in combination; as the development proceeds, additional cues are added if they significantly help reduce errors of understanding (Ellis 2006a).

4.2.2. Salience, outcome importance and depth of processing

Apart from frequency and reliability, the salience of a cue and the importance of the outcome are usually listed among the key factors that influence the use of the cue in processing and, consequently, the degree and rate of its acquisition.[5] In language

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[5] Salience is usually understood as a certain distinct quality which makes an item conspicuous and, because of that, more attention-grabbing. Salience is both a physical and psychological

processing, most grammatical morphemes can be characterised by low internal salience: due to the processes of grammaticalisation and phonological reduction, especially in fast speech production, most function words and suffixes are difficult to perceive (both aurally and visually), which explains why they are often missing from the competence of naturalistic learners (see section 4.1).

The degree to which a cue is salient is additionally closely linked with the importance of the outcome it is related to, that is with its significance in the overall interpretation of the message (Ellis 2006b: 170). Relatively low communicative importance of some linguistic features (English articles being one of the best examples) is then another factor that contributes to their low salience. In other words, learners' attention is not focused on the cue because of the redundancy of outcome in effective everyday communication and comprehension. In consequence, as pointed out by Ellis (2006b: 170), "a language learner might never get around to noticing low salience cues, particularly when their interpretation accuracy afforded by the other more obvious cues does well enough for everyday communicative survival".

Another point when the effects of selective attention and salience might be used to explain some problems of SLA (especially these related to grammar acquisition) concerns a situation when two or more cues are presented together and jointly predict an outcome. The results of experiments show that the strength of conditioning to each cue depends upon their salience, with the more salient cue becoming associated with the outcome and the less salient one being overshadowed (Kamin 1969, quoted in Ellis 2006b). For example, an English sentence in Past Simple Tense may contain two cues guiding the proper interpretation of the time reference: a grammatical one (verb marked for the past tense, e.g. the [-ed] suffix) and a lexical one (a time adverbial, e.g. *two days ago*). Because in language processing speakers give priority to lexical elements (content words that are more meaningful, and thus more salient in terms of their function) before processing grammar (cf. VanPatten 1996), the grammatical morpheme indicating the Past Tense may be overshadowed by a more salient cue, i.e. the adverbial. Moreover, because cues already associated with a specific outcome may inhibit or even block other cues that might be later additionally associated with that outcome, some L2 cues might stand little or no chance of being noticed, especially when the learner ignores the possible errors because of their little importance in the overall interpretation of the message.

The inclusion of the effects of salience and outcome importance allows the researchers such as Ellis to explain a range of phenomena that are difficult to account only in purely frequency-of-occurrence-based models. The so-called "one-shot" learning, when a linguistic form seems to be mastered instantaneously after its first encounter, is an example of such a phenomenon. As observed by Gass and Mackay (2002), sometimes an infrequent item can be acquired precisely due to its peculiarity and infrequency of occurrence or because of some individual learner needs. In other words, the form becomes more salient and so more readily attended

concept, i.e. both the stimulus and the observer might possess characteristics which are likely to increase salience.

to if it is conspicuous or particularly important in the interpretation of the message in the specific context.

In view of the above, Ellis (2005) suggests that if the effects of salience are included in connectionist models, we would have to accept that it is not so much the cue's frequency, but the depth of its processing that seems to influence the strength of neural connections. The concept of processing depth has its roots in the classical cognitive models of memory, in which it has long been recognised that "memory trace persistence is a function of depth of processing, with deeper levels of analysis associated with more elaborate, longer lasting, and stronger traces (Craik, Lockhart 1972: 671, quoted in Ellis 2005: 320).

The effects of the level of processing (its depth) are not (yet?) included in artificial neural networks, in which the strength of connections is dependent only on processing frequency. It seems, however, that the processing-depth interpretation offers a more unified and thus more plausible explanation of language processing and acquisition. From this perspective, frequency of occurrence in language would not be the major determinant of a cue's processing speed and the rate of its acquisition; rather, frequency would be viewed as one of the factors increasing the form's salience, and consequently the depth of its processing. Such an approach would not belie the connectionist models, since in practice the most frequent cues are also the most salient because of their prototypicality and high functionality (Ellis 2005: 320). At the same time, the framework would be capable of accommodating instances of impaired acquisition of high-frequency and low-salience cues (such as most grammatical morphemes or articles), as well and examples of fast learning of low-frequency but high-salience cues ("one-shot" learning).

4.2.3. Learnt attention and interference

It has been stated in the preceding section that in L1 acquisition speakers gradually learn which linguistic cues are linked with specific interpretations and thus are best predictors of outcomes. In this way, language users are made more sensitive to certain types of cues and the possible cue-outcome associations. This "learnt attention", i.e. the L1-guided predisposition to pay attention to certain cues rather than others (e.g. word order rather than case inflection marking to identify subject) is automatically applied in the interpretation of second language input. This means that that the learner may process L2 using L1 cues. When, additionally, using such a strategy does not interfere with successful comprehension and communication, the learner may never shift attention to appropriate L2-specific cues. For example, English learners of German tend to rely on word order to identify the subject and object of a clause, using a familiar cue, which blocks cues used to mark subjects and objects in German (cases); as a result, the case marking system is often difficult to learn only by exposure to input even if it is a very frequent and reliable cue for subject/object identification in German.

In sum, the concept of learnt attention can explain why some important L2 cues are ignored or unsuccessfully associated with their interpretation. As such, learnt attention can be regarded as the main psycholinguistic mechanism responsible for

the effects of the so-called positive and negative language interference (transfer), i.e. the influence of first language knowledge on L2 performance and the process of L2 development. It also points to the necessity of influencing the natural, implicit L2 processing in such a way so as to help the learners notice (i.e. draw their attention) to the cue-outcome association which might be difficult to establish correctly.

Ellis's (2006a, 2006b) analyses presented in this section show that fundamentally the same input processing strategies can be used to explain both L1 and L2 acquisition. As I have tried to show, more refined and detailed developments of the emergentist/usage-based model are now available, which accommodate a range of SLA-specific phenomena and therefore make the model more adequately applicable to L2 teaching.

4.3. Role of explicit memories

In the preceding section I have shown how the usage-based conception of language processing and acquisition can be made progressively more fine-tuned to the specific context of SLA. At this point, I would like to present a further refinement to the theory and present some more psycho- and neurolinguistic evidence which shed even more light on the role of explicit memories in learning and which therefore can be used as psycholinguistic justification for the explicit teaching grammatical rules.

As I have already mentioned, the usage-based account envisions the emergence of all linguistic generalisations as an essentially data-driven, bottom-up process. The perception of similarities, which underlies categorisation and schematisation, is possible because the common features in various input data, when frequently co-activated, obtain the status of a "short-cut" neural pathway.[6] The emergentist associative learning mechanism, which is simulated in connectionist artificial neural networks, does not, however, provide a complete account of language development. As discovered by Robinson (2005) there are differences in the effects of implicit learning of artificial (invented) grammars and grammars of natural languages. Robinson has found evidence that associative learning, which is driven by the units' frequency in the input data, does not have the same effect on learning artificial and natural language stimuli. Robinson explains that the difference is probably the result of special type of semantic processing which accompanies natural – but not artificial – language processing. Robinson (2005: 261) concludes that "incidental learning [i.e. learning through exposure] entails a variety of conscious, explicit learning, rather than simply unconscious and implicit, although associative learning plays a role there too".

Further evidence for the special role of semantic processing and explicit type of learning in what has traditionally been understood as implicit learning is provided by other neurolinguistic findings and hypotheses. A conception of how the explicit and implicit types of knowledge might interact is presented by Ellis (2005),

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6   For example, we are capable of conceiving of a category (e.g. the dog) by activating only the common features of all examples of the category and ignoring the specific category-member individual features. The schema is a "short-cut" pathway because it is not necessary to evoke memories of all experienced category members each time we want to conceptualize the category.

who shows that explicit memories[7] are necessary for the subsequent operation of implicit learning mechanism.

As the first argument in support of his claim, Ellis (2005: 318) quotes brain activity observations of two complementary memory systems: one in the hippocampus and the other in the neocortex. The hippocampus is known to be responsible for the operation of declarative (explicit, for Ellis) memory, which subsumes episodic and semantic memories; the neocortex, in turn, is associated with procedural (implicit, for Ellis) memory. According to Squire and Kandel (1999, quoted in Ellis 2005), the hippocampus is responsible for binding disparate representations registered in the working memory into a unitary representation, thus creating explicit (declarative) memories.

The role of the hippocampus and declarative memory in learning is usually illustrated with the clinical observations of patients suffering from anterograde amnesia, whose hippocampal system has been damaged. Anterograde amnesic patients seem to be devoid of the ability to form episodic memories (they perform very poorly on tasks in which they are explicitly asked to recall past events) but they have normal procedural memory and can learn motor or some cognitive skills (playing an instrument, solving a puzzle). Ellis (2005: 319) quotes Parkin's (1987) and Squire's (1992) findings which show that amnesic patients have difficulty learning novel concepts or word meanings from a few study episodes and can learn new words very slowly and only after many repetitions, which suggests that "no explicit memory ability equals no ability to consolidate novel linguistic constructions" (Ellis 2005: 319).

The findings pointing to the significance of the hippocampus and explicit (declarative memory) can be linked with neuroimaging observations showing that in healthy subjects the hippocampus tends to be active early in training, with greater activations evident for stimuli seen initially rather than repeatedly, whereas later in training, recall and manipulation of memories results in neural activity in neocortical regions (Ellis 2005: 318). Ellis interprets these data as evidence that at early stages of learning, the new material has to be temporarily stored in the hippocampus in the form of an explicit (declarative) memory, where it becomes first encoded. Only then can memories, as a result of implicit (associative) learning mechanisms operating on every subsequent occasion of use, be gradually passed on to the neocortex for permanent storage (Ellis 2005: 321).

Explicit memories of linguistic form-function conjunctions are constituted by specific and concrete exemplars, usually these that are most frequent, salient, of prototypical meaning and high functionality (Ellis 2005: 320). If, for the reasons discussed in sections 4.2.2 and 4.2.3., a learner fails to consolidate such new L2 units at the initial stages of acquisition, their further implicit processing cannot contribute to more learning. In other words, new linguistic units (form-meaning associations), if not initially consolidated as explicit memories, cannot be fed into the implicit learning mechanism, which means that more processing will not contribute to more learning.

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[7]   In psychology, Ellis's explicit memories are referred to as episodic memories.

Ellis's account offers a different perspective on facts and observations which have essentially long been acknowledged by educationalists and SLA researchers. It offers a neurolinguistic explanation of the hypotheses and theories which have already been formulated in classical cognitive terms. The account allows to explain the failures of purely implicit learning (see section 4.1) as well as the positive influence explicit instruction reported in many studies (e.g. Norris, Ortega 2000). Ellis's views are consonant with some earlier SLA theories such as Schmidt's Noticing Hypothesis (Schmidt 1990), according to which attention at the level of noticing is a necessary pre-requisite for the acquisition of a given form-function mapping. It also provides support for VanPatten's (1996) Processing Instruction, which aims to change students default processing of input by manipulating attention in such a way that maximises the amount of intake (i.e. this part of the input which is noticed), and the contemporary Focus on Form Movement (Long 1991; Doughty, Williams 1998), which recognises the importance of focusing students' attention on linguistic forms during meaningful communication. Finally, and most importantly from the point of view of the present article, Ellis's observations provide a justification for CG-based grammatical instruction.

5. Rationale for meaningfully-motivated rules

The preceding sections presented the state-of-the-art psycholinguistic knowledge which can justify the explicit teaching of grammatical rules within an essentially usage-based theoretical framework. It has been concluded that seen from a usage-based perspective, as generalisations pertaining to form-function (form-meaning) associations, the grammatical "rules" have an important role to play in SLA because they facilitate processing and enable subsequent implicit learning from the input.

Cognitive Grammar, with its meaningfully-motivated rules seems to be applicable to L2 teaching precisely because of the fact that the rules (generalisations) it describes should, at least theoretically, help students create form-meaning associations of a different kind than those formed on the basis of rules traditionally presented in grammatical reference books for L2 learners. Cognitive Grammar analyses of grammatical structures usually try to either discover and present the most schematic meaning common to all "uses",[8] or show how the prototypical meaning and usage develops through (usually metonymic) extensions in a range of related contexts.[9] Because CG assumes that conceptualisations are mental images of our perceptual

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[8] For example, a schematic definition of the indefinite article (all its uses) is that the indefinite article evokes a conceptualisation of the referent and one, arbitrary member a given category.

[9] For example, the definite article, which evokes a conceptualisation of an entity which is known, familiar and identifiable by the speaker, is prototypically used to direct the listener's attention to an entity he is able to identify. However, "the" can also be used when the hearer is not able to identify the referent. In this case, the purpose of using "the" is to make the hearer take the speaker's perspective rather than to identify the referent. The use of "the" to signal perspective is an extension of the article's prototypical function.

experience, most of the schematic meanings discovered by CG lend themselves to visual, graphical representation. Some exemplificatory CG-based pedagogical rules and their graphical illustration are presented in Appendix 1. It is hypothesised that explaining and presenting visually the differences in conceptualisations (construals) conveyed by different structures, the CG-based instruction could be more beneficial than traditional grammars a number of respects.

Firstly and most crucially, in contrast to traditional pedagogical explanations, by providing a schematic notional definition of various grammatical units, CG-inspired teaching should enable students to link the formal feature (the cue, e.g. the [-ing] verb inflection), with a particular semantic interpretation (the outcome, e.g. the conception of one stage of a continuing process). By presenting either the most general meaning of the structure (i.e. the schema) or the prototype with its radial, meaning-based extensions, the CG-based rules are more likely to present to the learners the cue-outcome associations which find reliable support in the input data. This might not be the case with the traditional rules, which often focus only on the formal conditions for the structure's usage (e.g. the presence of an adverbial indicating a definite moment in the past as a condition for the Past Simple tense; the presence of an *of*-phrase following a noun as a requirement for the use of "the"). The problem with such low-level, often purely formal and superficial generalisations is that students are very likely to encounter language data which do not conform to the rule (e.g. a sentence in Past Simple with no time adverbial, an *of*-phrase preceded with an indefinite article). As a result, learners who study traditional rules and then are asked to apply these rules in a series of controlled exercises composed precisely to illustrate these rules can become quite skilful at explicit rule application, but are notoriously incapable of improving their accuracy in fluent language production which requires the use of implicit knowledge.

The theoretical framework presented in this article allows to explain the failures of traditional rules as a consequence of inadequate cue-outcome associations that are established through such rules. As predicted by the Competition Model, if a cue (e.g. a given article) is not reliably tied with a predicted interpretation (outcome), the strength of the cue-outcome association does not increment. For that reason, only some of the form-meaning associations made on the basis of information passed on through traditional rules can be effectively used in processing, and, consequently, entrenched as implicit knowledge.

The second advantage of CG-based rules is that they seem to be more universally beneficial than the traditional rules. This is due to the fact that their meaningful nature should appeal to all types of learners, independently of the individual differences in intelligence or learning style. This claim is based on the assumption that cognitive explanations in fact refer to human-general perceptual and conceptual abilities. Because all people form concepts on the basis of their bodily (usually perceptual) experience, the visual presentation illustrating the images conveyed by different grammatical structures should therefore have a similar effect on all types of learners. This observation has been partly supported with research reported in Król-Markefka (2011), which investigated how the effects of CG-based and traditional

instruction correspond to the students' learning styles. It has been found that while the CG-based instruction increased students' accuracy in using articles independently of their learning style, traditional instruction brought significant improvements in accuracy mostly in the case of the so-called actual-routine[10] learners, i.e. learners who like routine, rules and step-by-step order, who like to study grammatical rules and like to focus on grammatical accuracy.

All in all, the introduction of meaningfully-motivated grammatical descriptions to L2 teaching appears to be psycholinguistically justifiable. However, although metalinguistic knowledge can be helpful – and sometimes necessary – in L2 learning, it does not influence implicit linguistic knowledge directly, and so even the best grammatical rules cannot improve learner's competence if further important requirements are not met. Therefore, it is crucial to specify also the conditions under which – according to the theoretical framework presented in this article – CG-based rules can be effective.

6. Conditions for meaningfully-motivated rules

In the light of the theory sketched out in this article the most important condition for the effectiveness of CG-based teaching is that the meaningfully-motivated rules should be accompanied with a great deal of language processing: extensive exposure to input as well as numerous opportunities for output production are necessary to enable a gradual strengthening of cue-outcome associations. If the linguistic knowledge is to become implicit, the explicit memories established with the help of rules need to be used in practice.[11]

Exposure to input is necessary for one more important reason: it shows the learners, who are familiarized with the meanings and functions of particular structures, whose conceptualisations and linguistic forms are conventionally selected in a given speech community in specific contexts. Students need to be aware that although the conceptualisations they want to convey through particular linguistic choices (e.g. a definite conception of the referent) depend on their intended meaning, the choice is limited to what can be actually correctly understood. At this point, the meaningful and the usage-based nature of language meet: although meanings encoded in various linguistic structures mirror mental images conveyed through language, these meanings are ultimately sanctioned by use, i.e. this can only be meaningful to others which is known and accepted in the speaking community.

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[10] According to Golay Learning Pattern Assessment (Golay 1982), which was used to tap the subjects' learning styles, learners can be divided into four categories: actual-routine, actual spontaneous, conceptual-specific and conceptual global.

[11] Such practice does not have to rely on conscious rule application. Although the so-called controlled practice (i.e. practice requiring conscious focus on linguistic forms) can be helpful at an early the stage of grammar teaching, as it enables students to understand better how the rule operates, it is crucially the so-called free-practice, i.e. actual language use in comprehension and production that truly contributes to language development.

In this way, the usage-based nature of CG both complements and restricts the CG theory's implications that could be drawn merely on the basis of its meaning-based focus. On the one hand, it allows us to explain the limitations to speaker's creativity in using language, by showing that although it is the speaker who decides on the choice of linguistic expressions that can most adequately convey the intended message, this choice is limited, as the utterance must conform to certain conventional norms in order to be understood.[12] On the other hand, the fact that language structure is usage-based explains also why some meanings conveyed in different languages, in spite of being rooted in human bodily and mental experience, are not universal, but specific to a particular speaking community. The two aspects are in fact linked:

> A CL approach emphasizes that language is usage-based and that speakers choose among an array of linguistic resources to convey a particular perspective. The exact way these resources are used to create a particular interpretation is largely conventionalized and so likely to vary from language to language. Taking a usage-based perspective might help students realize that even though their word choice, sentence structure, or essay organization might not be incorrect in a technical sense, it may vary enough from the target L2 prototype that native speakers may find it difficult to comprehend (Verspoor, Tyler 2009: 169).

It must be stressed that although CG assumes that "conventional usage almost always has conceptual motivation" (Langacker 2008: 72), it also acknowledges that the actual conventions accepted within a particular speaking community may depend on a range of factors which are not meaningfully motivated – most notably on the phonological properties of units (cf. Taylor 2002: 90–93).[13] For that reason, in spite of semantic-based *motivation,* linguistic units are largely *unpredictable* and so *arbitrary* in the sense that they are fixed by the convention of a given language (Taylor 2002: 339). This is why, in brief, the awareness of the meaningful motivation in L2 teaching fostered through CG-based rules necessarily needs to be accompanied with the knowledge of the actual linguistic conventions, which is best obtained through extensive exposure.

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[12] For example, Boers (2004) noticed that in the case of teaching figurative language and idioms on the basis of CG, the awareness of themes for conceptual metaphors such as ANGER IS HEAT often leads to the acceptance of non-existent expressions such as "she was a flame-thrower" as an idiom illustrating one' anger. Boers suggests that such creativity is not recommended if learners strive to achieve native-like proficiency, but it could be accepted in the context of teaching English for intercultural communication. This, however, does not seem to be the case with grammar. The intended meaning of invented figurative metaphors such as the one mentioned by Boers can be relatively easily comprehended even by a speaker who had not been acquainted with conceptual metaphors. As for grammar, conceptual differences between structures are not usually salient enough to be discovered without training. Consequently, the meaning conveyed by the unconventional use of grammatical forms might be either misunderstood or considered improper.

[13] According to Langacker (1987), a symbolic linguistic unit is composed of a semantic and a phonological pole. Both poles of the linguistic sign – the semantic and the phonological – are conceptual, i.e. they are mental entities stored in the persons' mind (Taylor 2002: 61) and, consequently, both poles influence the shape of the concept.

7. Conclusions

In sections 2 and 3.5. I have quoted a number of claims made by applied cognitive linguistics which apparently seem to contradict each other: while some advocates of CG encourage explicit teaching of rules, others discourage it on the grounds that language can be best learned implicitly, though bottom-up input processing. As I have tried to show, the conflict between the two points of view arises probably due to overemphasis of one of two poles between which cognitive linguistic is stretched, i.e. between its meaning-centred and its usage-based foci. As emphasised by Langacker (1996: 333) "[a]s a primary instrument of thought and communication, language is grounded in both cognition and social interaction. These facets of its dual basis are intimately related and ultimately indissociable.". It is important therefore, that the "indissociability" of both "thought" and "communication" should be also evident in the teaching materials presented to students. The meaningful motivations and the conventional usage both complement and condition each other and, as such, both should be given equal emphasis in pedagogical applications of the CG.

The aim of the article was to place various pedagogical implications of Cognitive Grammar in a psycholinguistic framework, which is both compatible with fundamental assumptions of CG and the contemporary findings on second language acquisition. It is hoped that the present study will enhance the understanding of a number of L2 grammar teaching-related issues which seem to be overlooked or underappreciated in many CG applications, contributing in this way to their greater empirical effectiveness.

## Appendix: Nouns with and without articles: CG-based pedagogical rules

Why do we need articles?

IDEAS – abstract concepts of things; there is just one idea of each thing

EXAMPLES – things we usually speak about

Rules:
- If we speak about the IDEA of a given thing, there is no article before a noun in singular:
  e.g. *I need to go **to bed**.*
- If we speak about one EXAMPLE of a particular idea, there is an article (*a/an* or *the*) before a noun in singular:
  e.g. *They've bought **a bed**.*
  ***The bed** was under the window.*
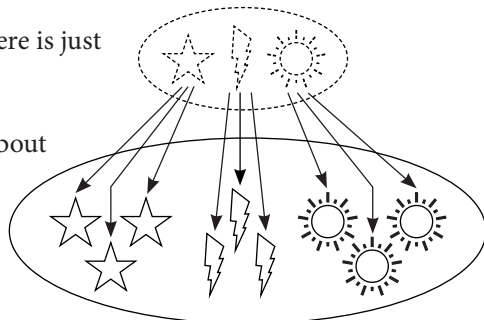
When do we speak about IDEAS?

1. When we mention a **place** to speak about its main IDEA (purpose): **go to prison/ church/hospital/bed/school**.
2. When we mention a **vehicle** to speak about the IDEA of a particular means of transport: **by car**; **by bus**, **by boat**, **by train**, **by plane**, etc.
3. When we mention a **meal** to speak about the IDEA of EATING: *We have **dinner** at 5.*
4. To speak about **special, prestigious professions** (**president**, **queen**, **king**, **pope**) – we show the function (THE IDEA) of the occupation: *He became Pope in 2005.*
5. In many **set phrases and idiomatic expressions**, where the meaning is not literal: *take ship*; *make/take place*; *be on deck/board*; *take/lose heart*; *talk shop*; *go to sea*.

***Rule*:**

WHEN WE **DO NOT** SPEAK ABOUT IDEAS, WE USE ARTICLES BEFORE THESE NOUNS, e.g.

*There is **a** church and **a** school opposite our house.*
*We slept in **the** car.*
*We had **a** delicious dinner on Sunday.*

Mass nouns

- Refer to things which are seen as if they extended infinitely.
- It seems that they do not have limits.
- We cannot say where one thing (e.g. air, darkness) ends and another begins – therefore we cannot count them, so they can't have plural forms (e.g. *This door is made of **glass***).
- When we speak generally about a mass, we do not use any article before the noun.
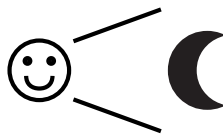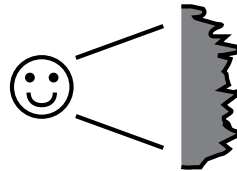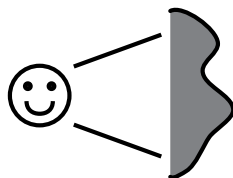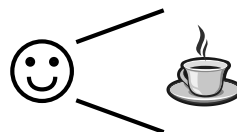

a moon   *darkness*

- The same nouns can be seen as count or mass:

I like coffee.   *A coffee, please.*

- **Mass nouns are similar to IDEAS**: usually, we refer to **the substance**, **the essence** or **the idea** of the thing rather than to an example as a whole.
    a. *I like **tea** with **milk**.*
    b. *You have **tomato** on your shirt and **egg** on your tie.*
    c. *The staircase reeks of **cat**.*
- Abstract nouns do not have to be mass nouns. Some abstract concepts are countable, e.g. *He has a problem; I have an idea.*
- When we speak about one indefinite example (made of that mass), we use „a".
- When we speak about a definite example (quantity) of that mass, we use "the".
    a. *He was deep in **thought** (= he was thinking).*
    b. *Suddenly, **a thought** came to my mind (= one thought).*
    c. *The **thought** that came to my mind was brilliant.*
       Or: *The **air** was fresh and **the water** was crystal-clear.*
- We can also use „a" **before mass nouns** if we do not speak the mass in general, but only about one of its kinds (e.g. **part of that mass having a particular quality**).
    a. *We can't live without **air**.*
    b. *There is **a bad air** in this room.*

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