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Rethinking the role of context and definition in second language vocabulary acquisition (SLVA): An assimilation via a cognitive model of concept formation

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Abstract

The motivational base of this study lies in the real-life problem faced by many L2 learners: How can learners achieve target-like lexical competence? It does not take much to demonstrate that knowing a dictionary definition alone is not enough, but how learning from context actually leads to accuracy of production has remained unclear. The present article addresses this issue by proposing a cognitive model that illustrates the role of context and definition as well as L1 translation in the acquisition of conceptual knowledge. Drawing on studies of L1 acquisition, particularly the usage-based theory of language acquisition, this paper discusses in depth how L2 acquisition differs from L1 acquisition in various aspects. Meanwhile, it accounts for the development of accuracy by adopting a gap-filling-oriented acquisition view. In summary, by providing a systematic account for how various components contribute to the acquisition of a word, the proposed model offers a solution to several important debates in SLVA besides giving new insights into a range of pedagogical and learning issues.

Keywords: concept formation; context; definition; gap-filling; instantiation; SLVA; usage-based

Rethinking the role of context and definition in second language vocabulary acquisition (SLVA): An assimilation via a cognitive model of concept formation

1. Introduction

One of the chief goals shared among L2 learners in vocabulary acquisition is none other than to be able to express oneself in an extensive range of communicative settings in a target-like manner. Accuracy, in terms of the productive aspects, requires learners to possess knowledge of the range of applicable referents of a word (Nation, 2001; Pavlenko, 2009). While word list consisting of the L2 forms and the corresponding meanings (usually in the form of an L1 equivalent or a brief definition) may allow a considerable number of words to be memorized effectively (see, e.g., Prince, 1996), it has little (if any) to offer when it comes to usage-related aspects such as when and where a word can be used, thus carries the disadvantage of low reliability as far as accuracy is concerned. This leads researchers (as well as reflective learners) to shift their focus to learning from context in which the target word is embedded. However, given the lack of a cognitive model that illuminates the role of context in the acquisition of vocabulary competence, learning from context remains a controversial issue (as will be discussed in Section 2.), and it is hard to establish a set of theory-based guidelines for practitioners (as well as learners) as to the amount and the kind of context needed for adequate acquisition.

In order to avoid unnecessary misinterpretation, there is a need to draw a clear distinction here between using context clues to *guess* the meaning of an unknown word, and using context to *learn* the meaning of words in the presence of definition. Learning may take place on both occasions, but the contextual conditions that facilitate respective purposes may differ greatly. Motivated by the fact that both context and dictionary definition (or word meaning presented in any explicit form) serve as potential resources to aid the acquisition of meaning, the present paper focuses on *learning* from context where definition is also at the learner's disposal.

2. Literature review

The importance of context in Second Language Vocabulary Acquisition (SLVA) has been a controversial issue over many years. On one hand, a number of scholars have pointed out the critical importance of context or contextual knowledge in vocabulary acquisition (Beheydt, 1987; Miller, 1999; Pavlenko, 2009; Sternberg, 1987); while on the other, empirical studies conducted to verify the effects of context have resulted in mixed findings, providing only partial support to the above claim (Dempster, 1987; Gipe & Arnold, 1979; Laufer & Shmueli, 1997; Lawson & Hogben, 1996; Nist & Olejnik, 1995; see Nation, 2001 for review). Some of these findings indicate a superiority of translation learning over context learning (Dempster, 1987; Laufer & Shmueli, 1997; Lawson & Hogben, 1996) while others reveal the positive effect of enhanced context (Nist & Olejnik, 1995).

One of the major problems of the above studies lies in the assessment method, where recall of word meaning has been the most commonly used indicator of learning gains (e.g. Dempster, 1987; Laufer & Shmueli, 1997; Lawson & Hogben, 1996). All such task requires learners to do is to provide a superficial meaning (and not how or when to use a word). Thus learning, in this sense, is arguably more effective when the form-meaning linking is retained via direct mnemonic strategies such as the keyword technique using paired list (see Nation, 2001). The nature of such meaning-recall tests renders rich contextual information unnecessary or sometimes even detrimental; as a result, learning in context may fail to demonstrate any clear advantage over translation learning. On the other hand, learning gains in aspects of knowledge such as applicable referents, situations of use, and finer aspects of meaning which are likely to benefit from context (and which elude translation learning) have been largely underestimated.

Parallel to this is the issue of sensitivity of test (Nagy, Herman, & Anderson, 1985). Learning from context is often a cumulative process which results in small but positive gains in each encounter (Nagy, 1997; Nation,

2001). Therefore test methods that see the goal of one meeting as an explicit correct meaning may exhibit floor effect and fail to account for the small amounts of learning, much more so when meaning is not provided and needs to be inferred from the context during the learning session. This shows that experiments designed to compare word list mode and context mode (without providing meaning) by testing learning gains using meaning-recall test are clearly biased favoring the former over the latter (e.g. Prince, 1996; Lawson & Hogben, 1996).

Another plausible explanation to account for the inconsistency in the reported findings is that not all contexts are equally informative (Beck et al., 1983), or more precisely, the pervasive lack of a well-defined criterion in terms of 'what' and 'how much' that determines the usefulness of context. For instance, in an experiment conducted by Laufer and Shmueli (1997) to compare the learning effect of different modes of vocabulary presentation with varying contextual information, an 'elaborated text' (allegedly the most informative mode) was illustrated by 'People willingly adopted this image and it was a stereotype seized upon *avidly* (target word) by the film industry as well' (see also Nist & Olejnik, 1995 for similar comparison of learning effect between manipulated contexts). However, how qualitatively different such context is compared to the original text (one of the four modes) 'It was a stereotype seized upon *avidly* by the film industry' in clarifying the meaning and use of the target word 'avidly', is questionable. A similar concern has been expressed by Nist and Olejnik (1995) regarding the fuzziness of how 'strong' (a notion equivalent to 'elaborated' in Laufer and Shmueli's study) context needs to be to result in adequate mastering of the meaning of a word. Without first establishing a basis to effectively control the independent variable, i.e. the quality of context, we are almost certain to obtain results of limited reliability.

The usefulness of context can be underestimated not only when the quality of context is not carefully controlled but also in cases where the target words are concrete nouns and verbs that represent readily available, familiar concepts in learners' L1 (e.g. 'owl', 'apron', 'to sink' presented to French-speaking learners of English in Prince, 1996; see also Lawson & Hogben, 1996). Since an L1 equivalent alone is sufficient in demonstrating the referent, it is not surprising that an additional context fails to prove any significance[1].

Besides L1 conceptual knowledge, prior knowledge particularly intra- and inter-lexical knowledge may have a significant impact on learners' readiness to learn a word. Intra-lexical knowledge refers to any previous knowledge of the use or meaning of a word, whereas inter-lexical knowledge refers to the state of acquisition of other conceptually related words. The lack of careful control of these factors will in turn affect the outcome of learning from context.

Therefore in order to provide a solid ground to argue for the importance of context and to disentangle relevant debates, we need to first understand what a context potentially does to the cognitive state of a learner during the acquisition of meaning. The gap in literature in this respect reflects the prevalent practice in SLA that is resistant to the development and exploration of formal models and often opts for informal, metaphorical ones (Meara, 1997). Meara (1997), taking the example of experiments based on the common-sense hypothesis that learners can acquire words from exposure to texts, made the following criticism:

> *In some ways, research of this sort of is a bit like a gardener planting seeds in a plot in order to confirm that they will grow into flowers. A good crop of daisies would indeed confirm the 'hypothesis', but it's not exactly thrilling science, and it doesn't do much to help us understand the process of germination, or how this process is affected by various relevant environment factors.* (Meara, 1997, p. 133)

3. Design of the study

The present paper aims to develop a comprehensive theoretical framework that addresses the following research questions:

1. What is the role of context in the acquisition of a word?

2. How does learning from context interact with other components such as the provision of an explicit meaning (either in the form of definition or L1 equivalent) and the current state of lexical knowledge?

Among many other aspects of vocabulary knowledge, this paper places its focus on the acquisition of conceptual knowledge, which is the lexical concept linked to words. The central issue in this inquiry is the mapping of words to real world referents which enables the learner to produce the word in a range of contexts where appropriate (Pavlenko, 2009). MacWhinney (1987, p. 253-254) distinguishes two kinds of conceptual knowledge, the 'basic percepts that often related to particular experiences, individual objects, or episodes' known as the semantic properties, and the 'constructs which derive from generalization across experiences, objects, episodes, and lexical items' known as semantic concepts. This distinction is adopted in the present article, with the terms semantic properties and semantic concepts corresponding to 'contextual knowledge' and 'conceptual knowledge' respectively.

The term contextual knowledge is used here to highlight the context-dependent nature of the semantic properties, meanwhile contrasting it from the context-independent, abstract nature of conceptual knowledge. The present discussion will focus exclusively on the formation of contextual knowledge and begin by a detailed account of what constitutes accuracy, followed by how context and contextual knowledge play a role in this connection. Next, the cognitive process, namely instantiation, that governs the formation of contextual knowledge from context (as an input) will be elucidated. Finally, the interaction between instantiation and the current state of lexical knowledge will be described. All components involved in the present paper are shown in Figure 1. It should be noted that this paper does not address the problem of how learners acquire the more abstract conceptual knowledge; however, the contextual knowledge outlined here shall serve as the first step which forms the foundation of conceptual knowledge towards securing accuracy.

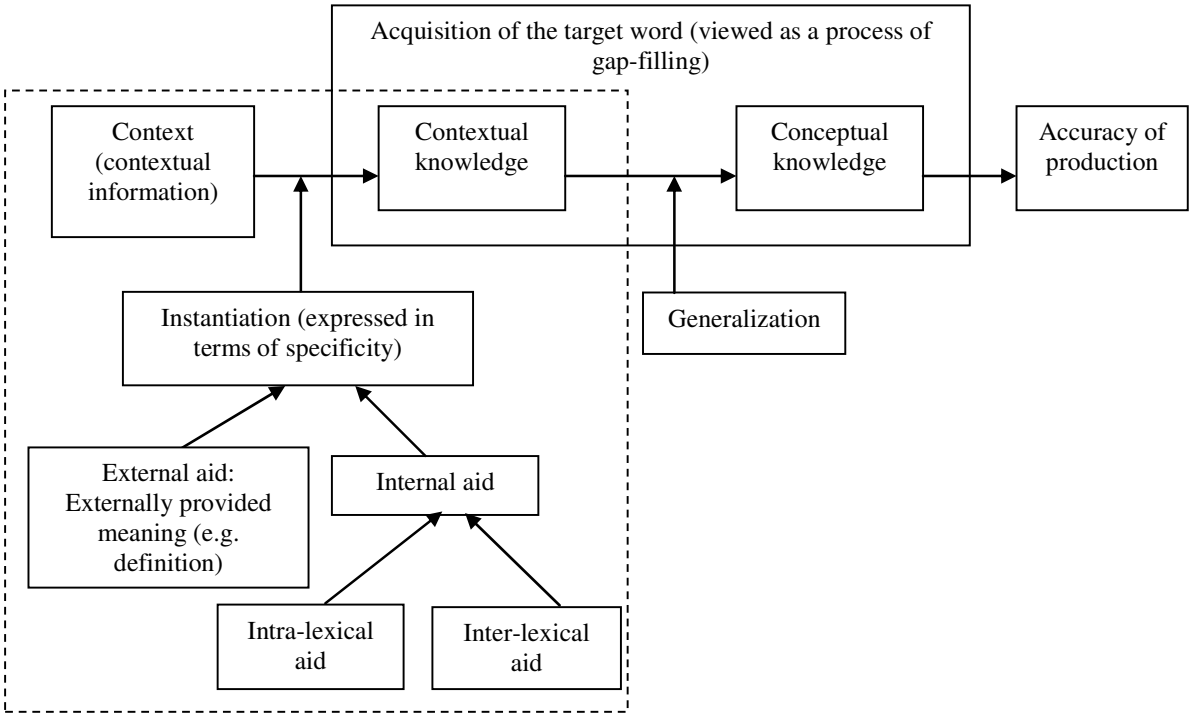


Figure 1. The formation of conceptual knowledge from context for a production-oriented goal (the main focus of the present paper is indicated by the box in dotted line).

3.1 Gap-filling and 'Specificity'

As stated in the introduction, the primary aim in the acquisition of concept is to attain the competence to

apply the lexical item to a range of referents in a target-like manner (Matsuda, 2004; Pavlenko, 2009). According to this perspective, acquisition can be viewed as an ongoing process of gap-filling[1] of knowledge, and the failure to comply with the norm will result in either underuse or overuse (also known as under-extension or over-extension, e.g. in Clark & Clark, 1977), as illustrated in Figure 2.

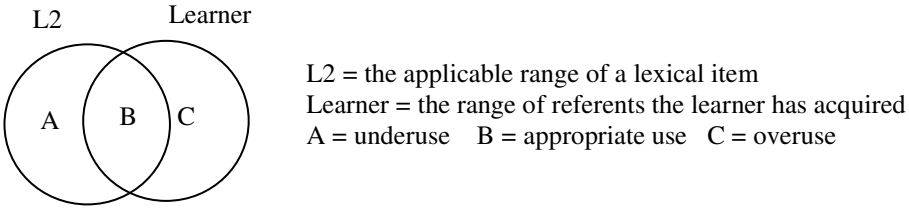


Figure 2. The state of acquisition of a lexical item

The L2 area is viewed as consisting of numerous real world situations or referents that can be expressed by the word, each of which constitutes a gap (can be pictured as a single tiny dot on the L2 area) which needs to be identified and acquired by the learner. As shown in Figure 3, any form of input that provides meaning of a word (e.g. a definition, a synonym or a sentence or a combination thereof) will encompass a certain range of assumed referents as a result of the learner's comprehension and interpretation, including referents transferred from L1 (in the case of an L1 definition or equivalent) or previously acquired knowledge of L2 (in the case of a synonym). Each of these inputs may vary in terms of the area they cover, and may fall either within or beyond the permissible scope of the word. The larger the coverage area is, the broader the range of application becomes; however, at the cost of risking a higher possibility of erroneous production (due to overuse) when the boundary is crossed (Figure 3a).

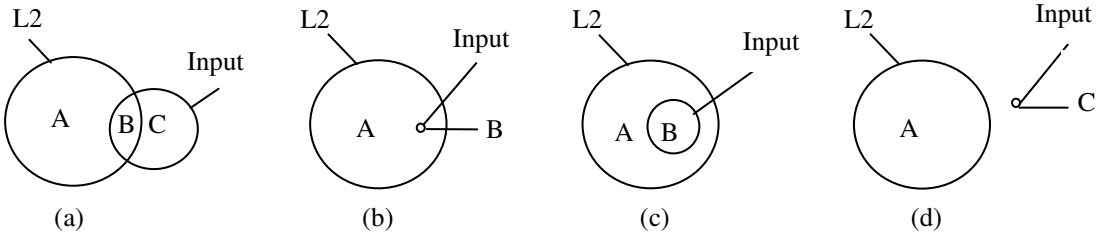


Figure 3 (derived from Figure 2). The acquisition of a lexical item (from a particular input), compared in terms of specificity and accuracy.

The hypothesis follows that the accuracy of gap-filling can be increased if the learner's comprehension of an input is highly specific[2], which is made possible via learning from context. The notion of 'specificity' proposed in this article is determined by the extent to which ambiguity of the situation referred to by the context in question is eliminated (based on the learner's perception). Specificity increases with the decrease of degree of freedom, i.e. the number of possible interpretation that could be made about a given context. Consider an English speaking learner of Japanese learning the Japanese adjective *fushinsetsu* (defined as 'unhelpful; unfriendly; inhospitable', according to Kenkyusha's New Japanese-English Dictionary 5th Edition) using the following dictionary example (ibid.).

[1] In the present paper, the term gap is used in a more narrowly defined sense to refer to 'a specific referent for which the learner lacks an expression'.

2 This, however, does not equate specificity to accuracy, considering the possibility of a specific yet inappropriate interpretation, as shown in Figure 3d.

1. *Oshiekata ga fushinsetsu na no de, ano sensei no jugyou ha sappari wakaranai.*

'He teaches very badly and I don't understand the lectures at all.'

The context, with the help of the given meaning 'badly; unhelpful', may evoke various interpretations including erroneous ones (Figure 3a, area C) such as 'an unskillful teacher who doesn't explain well' and 'a teacher who is unable to provide a proper solution to his student's doubts' which will lead to inappropriate usage if the learner attempts to use the word in these situations[3]. According to this view, the above context could be more of a hindrance than a help and thus it can be said to contain minimal additional value compared to the provision of a definition alone without context.

In contrast, consider one who encounters the word *fushinsetsu* in the following context and looks up the meaning ('badly; unhelpful') in the dictionary.

2. *Seito ni totte najimi no nai muzukashii senmon yougo wo takusan tsukatteiru ue ni, nanno hosoku setsumei mo shinai. Fushinsetsu kiwamarinai.*

'It is so unkind of the lecturer to use lots of difficult technical terms which the students are not familiar with, without making any effort to explain them.'

From this context, the learner will now be able to rule out possibilities such as 'bad teaching owing to an inadequate knowledge' that arise in the first example, by narrowing down the interpretation to the lecturer's inattentive attitude (Figure 3b). Note that such context does not necessarily need to appear in full in the utterance, nor does the learner need to understand every word in the utterance. It is about how much information concerning the situation in which the word is used is available to the learner that helps him to rule out inappropriate interpretation, regardless of whether such information is being expressed verbally or not. It is then justified that the richer contextual information is, the more efficiently elimination can be carried out.

However, a context may evoke different representations when presented to different individuals, thus the effect of context cannot be presupposed without taking into account the cognitive process in which learners undergo in interacting with the context. In short, it is the contextual representation that learners form from a given context, and not the context per se that imparts specificity. Therefore, there is now a need to look beyond context and explore the internal cognitive process that governs the formation of contextual knowledge.

3.2 Formation of Contextual Knowledge

It has been long established in the field of psychology that in language comprehension people employ context and their knowledge of the world to narrow the meanings of words encountered in context, a process that has been termed instantiation (Anderson, Stevens, Shifrin, & Osborn, 1978). For instance, given the sentence 'the fish attacked the swimmer', most people will instantiate this fish as a shark (Anderson, Pichert, Goetz, Schallert, Stevens et al., 1976). Consequently, the instantiation for the word 'container' will not be the same in 'the container held the apples' and 'the container held the cola' (Anderson & Ortony, 1975). Anderson et al. argue that the mental representations that people generally construct for words in context are 'richer and more detailed than dictionary definitions' (1978, p. 149). For the purpose of this paper, instantiation is viewed as the process in which specificity of referent is achieved; however, there seems to be varying degrees to which instantiation can be made. For instance, instantiation for 'container that holds the apples' may consist of a vague image representation of a rattan basket, but can also contain more elaborate details such as the attachment of a handle, the pattern of the mesh of the basket, size, etc. This may not be an issue of concern to Anderson and his colleagues in their investigations on L1 speakers, as any instantiation made is readily confined within the scope

[3] One might argue that learners are also capable of making a single, specific interpretation from the given context. However, this is unlikely to happen as inference is not supported by sufficient reliable cues; and even if it did happen, the interpretation is most probably a deviated one, based on the same rationale.

of one's already established concept (i.e. presumably in accordance with the norm). However, in the case of L2 learners, there is a possibility that instantiation may deviate from the applicable area of a word (Figure 3a, area C). In that case, the extent to which instantiation is performed may be crucial to the accuracy of contextual knowledge formed. For instance, given the context in example (1), suppose that a learner instantiates 'a teacher teaching extremely fast', but fails to infer further details such as the teacher's intention or the situation of the class. As a consequence, inappropriate usage may occur if the learner uses *fushinsetsu* to express a situation such as 'an advanced lecture in which difficult syllables are coupled with fast teaching but presented in a well-organized manner'. This is because *fushinsetsu* is only applicable in situations where 'one disregards the needs of the person(s) he is dealing with' (for instance, 'a teacher teaching fast without considering the ability of his students', or 'a teacher who does not conduct his lecture systematically, leaving out important details here and there'), and the failure to include such feature in instantiation may lead to production error. Such issue does not arise and is not addressed in Anderson's studies, as the inquiry is about how speakers (mainly native) who already possess knowledge about the word in question instantiate in the process of comprehension. It is exactly this conceptual knowledge that L2 learners lack which needs to be built up from context.

In this paper, the term instantiation will be used to refer to the process in which learners interpret a context by identifying the particular referent or situation being referred to, in line with the definition in Anderson et al. (1978). Meanwhile, it differs from the literature in two ways, first in the sense that instantiation is not an all-or-none process but allows a gradation expressed in terms of the degree of specificity; and second, the subjects in the present study possess no conceptual knowledge concerning the word in question. In brief, the inquiry of the present paper is about how L2 learners *learn* from context via instantiation, as opposed to that of Anderson et al. (1976; 1978) about how L1 speakers *comprehend* a context via instantiation. Note that it is also imperative for L2 learners to comprehend a context in order to learn from it; however, the resources that L1 speakers utilize in instantiation are not available to L2 learners, rendering the mechanism significantly different. In order to construct the learning process of L2 learners, it is useful to look at that of L1 learners under similar condition, i.e. learners are at a state to derive and acquire meaning from context.

In his influential study on young children's acquisition of their L1, Tomasello puts forth a social-cognitive model known as the usage-based theory of language acquisition, suggesting that language acquisition emerges as a product of the desire to communicate and to participate in various social interactions (Tomasello, 2003). The foundational process involved in word learning consists of components depicted in Figure 4.

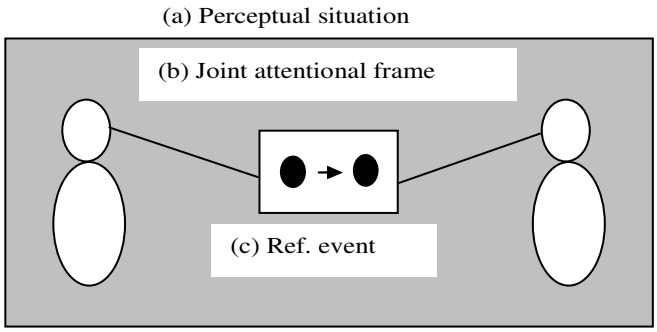


Figure 4. The basic adult-child communication situation: (a) the perceptual situation (not relevant to utterance); (b) the joint attentional frame (immediate relevance); and (c) the event being referred to linguistically (Tomasello, 2003).

The child must first establish some form of common ground with an adult, known as the joint attentional frame, and then within this frame be able to understand the adult's specific communicative intention in order to determine the adult's intended referent in using a particular linguistic item. Take for example, a study conducted by Akhtar et al. (1996) with a setting in which a child, her mother, and an experimenter were playing together with three novel objects. The perceptional situation of the child includes, besides the toys and the participants,

many other things in the room. The joint attentional frame is those novel objects and activities that the child and the adults know are part of the attentional focus of both of them. As the mother left the room, a forth object was brought out and the child and the experimenter played with it, noting the mother's absence. When the mother returned, she looked at the four objects and exclaimed 'Oh look! A modi! A modi!' Following the mother's gaze, the child now discerned the mother's focus of attention to the four objects, and within this newly established joint attentional frame, inferred that the mother is referring to the fourth object by determining that it was new to the mother and thus likely to elicit excitement.

There is no reason as to why Tomasello's model cannot be applied to L2 learning under similar circumstances. However, while Tomasello's subjects (i.e. young children) rely exclusively on intention reading to infer meaning from a communicational context, adult L2 learners are armed with previously learned concepts in their L1, besides being capable of employing the social-cognitive approach as described above. This enables L2 learners to make use of L1 definitions to learn from brief examples provided by dictionaries or textbooks when learning takes place in settings where genuine communicative interaction is scarce, particularly in a foreign language environment.

Drawing on the studies of Anderson et al. and Tomasello, this paper postulates that L2 learners instantiate via a two-step process, consisting of (a) the formation of background knowledge (also known as function readiness, see MacWhinney, 1987); and (b) the identification of the referential situation. The first step is derived from the 'perceptual situation' in Tomasello's model, but differs in the sense that in the current framework, background knowledge encompasses a wider range of sources, including a similar experience in the past or anything that is beyond an immediate perceptual situation but which the learner is able to visualize. This is justified by the fact that in the case of L2 learners, since their focus of attention can be directed by previously learned words (including L1 knowledge and L2 synonyms) or a linguistic description (as will be illustrated in the second step), they shall not be confined to an immediate perceptual situation. But the underlying principle remains the same—in order to be able to correctly infer the referential situation in a particular context, one has to first acquire nonlinguistic knowledge that embodies the concepts involved (Tomasello, 2003). For instance, consider the following example of the word *fushinsetsu.*

fushinsetsu-na toriatsukai setsumeisho

'A user-unfriendly instruction manual'

Examples of background knowledge required for the above context include 'a thick manual without an indication of content giving users a hard time searching for a desired information', 'the lack of illustration to guide assembly of the product', 'a manual written solely in English yet targeted for a community whose English is not the common language' and plenty others. Example (1), on the other hand, requires the learner to have experienced 'a teacher who is inattentive to the needs of his students' by, for instance, having attended the same lecture as did the speaker who produced the utterance, and having shared mutual feeling. These perceptual situations form the basis of production, from the viewpoint of an input producer; and the basis of comprehension, from the viewpoint of an input receiver. The kind of knowledge required at this stage is neither substitutable by nor obtainable from any form of explicit description—knowing a full description of 'tapir' simply cannot compare to knowing how the animal looks like. In cases where the word represents a concept that is non-existent in the learner's previous knowledge, he will need to acquire new knowledge which may include visual (mental imagery), auditory (sound), and kinesthetic (sensory-motor) information and may even need to undergo cultural learning.

As previously discussed, the extent to which instantiation is performed is expressed in terms of specificity, according to the view in this paper. In order to account for the degree of specificity in the process of instantiation, our perceived world is depicted as an entity comprising of numerous elements, whereas instantiation is viewed as a process of identifying the elements being referred to (hereinafter termed as 'relevant element'). Relevant elements are contextual components that are related to the use of a word in a particular context. It is important to

note, however, that this paper is by no means arguing for a set of a priori 'necessary and sufficient elements', considering the fact that the use of a word is not attributable to a set of rigid dimensions but the criterion is usually fuzzy and dynamic, as was demonstrated by Labov (1973) in his classic study with the word 'cup'. Rather, the current view posits that as more elements are instantiated, not only are chances of erroneous interpretation reduced, but more information becomes available for further manipulation in the subsequent processes of acquisition (such as generalization, as will be discussed in Section 3.4). Instantiation may contain not only the core meaning but all the information that specifies a given word, including how formal the word is, the subtle nuances or connotation it carries, and other constraints of use (see La Heij, 2005 for a similar line of argument). It is the rich conceptual representation formed in this stage that accounts for the target-like performance.

The notion of relevant element is employed here to demonstrate that the absence or indetermination of such element will result in a higher degree of freedom for interpretation (i.e. lower specificity) thereby increasing the possibility of misinterpretation. Inadequacy may also arise if the wrong elements are instantiated (as a consequence, the relevant elements remain absent from the learner's perspective), despite its high specificity. The basic process of instantiation illustrated in the form of element is shown in Figure 5, and conditions that contrast an adequate instantiation with an inadequate one are depicted in Figure 6. 'Irrelevant elements' are elements of which presence has negligible effect on the accuracy of knowledge.

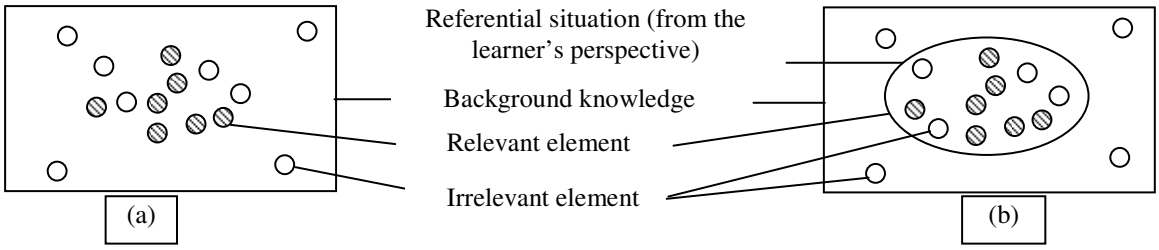


Figure 5. Instantiation consisting of 2 steps: (a) the formation of background knowledge; and (b) the identification of the referential situation.

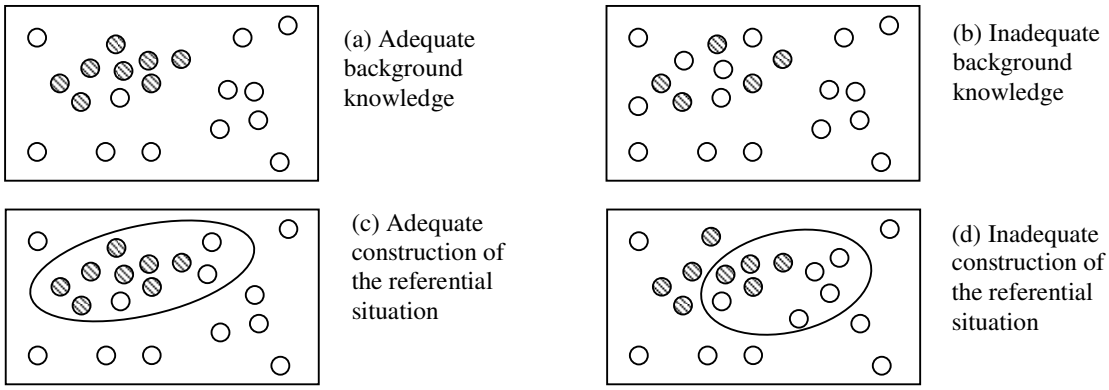


Figure 6 (derived from Figure 5). Sub-steps of instantiation in an adequate and inadequate condition.

Building on the basis of background knowledge (Figure 5a), the second step (Figure 5b) involves identifying the referential situation symbolized by the target word in a context. This corresponds to the identification of the speaker's intended referent within a joint attentional frame illustrated in Tomasello's framework, except that L2 learners are not restricted to intention reading as the only means to infer meaning—they may make use of meanings provided externally e.g. word definition or verbal description to assist instantiation. This is to say that L1 knowledge plays an important (but not exclusive) role at this stage following the hypothesis that, if an L1 translation of a minimal context is sufficient to confine any and all possible interpretations to the permissible

scope of the word, less specificity is required (Figure 3c). On the contrary, if deviated interpretation cannot be effectively eliminated by an L1 aid (Figure 3a), a higher specificity is required and thus more elements need to be instantiated (resulting in a representation as shown in Figure 3b).

In example (2), as there is no readily available L1 equivalent or translation that could lead to the precise instantiation, the learner needs to identify the referential situation that matches the context, for instance 'the teacher's lack of consideration for his student's ability and learning needs'[4]. However, if the learner mistakenly infers the intended situation as 'the teacher's intentional act to assert his academic superiority over his students' or 'a deliberate use of difficult technical terms to perplex the students on purpose', instantiation (of the word *fushinsetsu*) becomes inadequate as these instantiations are related to *eraburu* and *ijiwarui* respectively, rather than *fushinsetsu*, while the most essential component such as 'the teacher's inattentive teaching' is omitted.

The presence of a communicative situation makes an important difference at this stage; first, in terms of the availability of a joint attentional frame. In a communicative context in which the speaker is referring to a person or event already known to the listener (learner), the referent is proximate and all the learner needs to do is to infer the corresponding referential situation within a narrow, immediate scope (i.e. the joint attentional frame). On the other hand, when learning occurs without a common ground shared between the speaker and the learner—including conversation about an event that is not known to the learner or learning from a non-communicative setting such as an isolated context provided by textbook or dictionary—the learner needs to make an extra effort to identify the referential situation out of an enormous storage of background knowledge (for instance, in the case of example (1)). An analogy can be drawn between this process and bird-watching—it goes without saying that spotting a specific bird (i.e. the intended referent) captured in a bird cage (i.e. background knowledge in a narrower scope) is much easier than locating it from a bird sanctuary (i.e. background knowledge in a broader scope).

Second, an interactive communication provides the learner with an opportunity to enhance or fine-tune an instantiation made via negotiation for meaning (see Long, 1996) (Figure 7). This may take place in various forms. For instance, upon hearing an utterance containing the unknown word, the learner may make an inference about the speaker's intended referent, respond accordingly, and obtain either positive or negative feedback (on the instantiation of the unknown word) from the response or reaction of the speaker. The processes of instantiating and getting feedback are inevitable in an ongoing conversation because discourse always presumes the exchange of meaning, and the intended meaning needs to be interpreted correctly by the interlocutor. Other forms of negotiation may include seeking confirmation about the inference one made or requesting for clarification of meaning from the speaker, at the point of time the utterance was made. Both of these factors provide an explanation for why acquisition is faster and less effortful in a second language than in a foreign language environment.

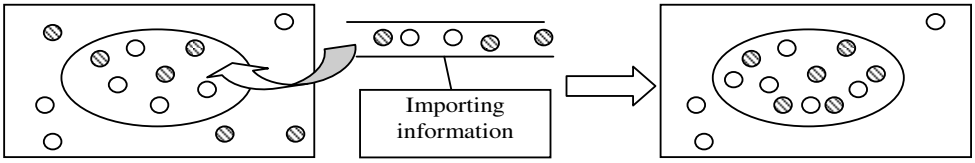


Figure 7 (derived from Figure 5). Importing information containing relevant elements to complete instantiation, either via negotiation for meaning or various top-down approaches (e.g. definition and L1 translation).

In addition, learner may also resort to the top-down approach such as using a dictionary definition (in either language) or an L1 translation as an aid to infer the referential situation in question (Figure 7). For instance, if

[4] There may be more than one event contributing to the use of a word in a particular context. For instance, the teacher not only uses difficult terms but also teaches in a speed too fast for the students to catch up with. Each of these constitutes a specific referential situation.

provided with the definition 'inconsiderate to the needs of others', learner would be at a better position to correctly infer the meaning of the context in example (2) and even in example (1). It is important to note that an explicit definition facilitates but does not inevitably lead to the success of instantiation, although the quality of the definition may have some impact on instantiation, just as 'inconsiderate to the needs of others' may provide learners with better cues compared to 'unhelpful' (e.g. see Nist & Olejnik, 1995 for the effect of modified definition on learning).

Such top-down approach is demonstrated especially drastically in example (3), where any and all possible interpretations that the L1 translation 'a user-unfriendly instruction manual' could possibly evoke coincide with those of the context in Japanese. In this case, a transfer of contextual knowledge from the L1 concept is sufficient to ensure the accuracy of gap-filling even without making a specific instantiation, because the possibility of erroneous production is completely eliminated (Figure 3c).

Upon discussing the mechanism of instantiation, it is then essential to address the question of how instantiation of a word is affected by the state of acquisition of other words as well as that of the target word.

3.3 Inter-lexical Aid

Not all words are used at the same frequency, with some being more frequent than the others (Nation, 2001). This is taken to mean that words vary in the range of contexts they cover, with high frequency words covering a larger range of use. Figure 8 shows the range of use of three words, presumably adjacent to one another in the learner's lexicon (hereinafter referred to as 'adjacent word'[5]) in view of their perceived relatedness of meaning. The acquisition of adjacent words has a significant impact on the learning of the target word, as Clark puts it 'what's already been acquired affects what gets acquired next' (1987, p. 23). The underlying principle is that two forms cannot be expressing the same meaning, and thus contrast (differentiation) between the known and unknown word helps to deduce the referent of the unknown word. In the following discussion, how prior knowledge of the adjacent words affects the instantiation of the target word will be described.

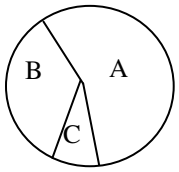


Figure 8. Words of different range of use.

It is posited that instantiation of a word can be enhanced with the help of its adjacent words, even when contextual information is inadequate. Suppose that in an attempt to instantiate a context for word C (Figure 8), the learner is faced with three possible interpretations which correspond to word A, word B and word C respectively. If the scope of word A and word B is known, he will be able to determine the correct instantiation for word C by means of elimination. Take for example the following situation. Someone found a bottle of sunscreen in the trash can and asked, '*Kore ha tsukaikitta*?' ('Is this used up (to the last drop)?') Judging from the commonsense that one usually discards something only after using it up, the learner infers that the interlocutor is referring to the state of emptiness of the bottle that explains for why it is discarded (and not due to other reasons such as expiry date etc.). However, he is unsure of whether the interlocutor merely intended to confirm that the bottle is emptied and so it is alright to discard it, or whether the interlocutor is trying to make sure that the sunscreen has been used up to the very last drop (say, to prevent wastage). Knowing that the interlocutor would have used the word *tsukaiowaru* (i.e. previously learned word; literally means 'finish using') instead of *tsukaikiru* (i.e. new word) if the former is intended, the learner may arrive at an inference that the

[5] The term 'adjacent word' is opted against the word 'synonym' here to highlight the fact that which words are close in meaning (and are therefore likely to cause confusion) is largely a matter of perception which may differ among learners, and that these words may not necessarily coincide with what linguists classify as synonym.

interlocutor is indeed referring to the latter (i.e., 'used to the last drop'). Without such inter-lexical aid, the element 'completely (used up)' would have otherwise eluded the learner, rendering the instantiation incomplete. In this way, contrast between the previously acquired adjacent word and the target word helps to deduce the specific referential situation, and by doing so, allows learners to discern the subtle and fine-grained meanings the target word carries.

It is worth noting that the effect of adjacent words is double-edged. In the event where the scope of word C is partially pre-empted by an overgeneralized adjacent word e.g. word A, even with a highly specific and accurate instantiation (of word C), the learner may still fail to perceive a gap for the word. As a consequence, the word may appear less salient to the learner and thus may be more easily rejected. By reinforcing the linking between the instantiated referent and its correct form (i.e. word C), however, the boundary of the overgeneralized word (i.e. word A) will eventually be narrowed down and the resulting gap be readily filled by the target word. The potential of inter-lexical aid in assisting instantiation brings out an important implication: when deciding on the words to study or to be presented to learners, order of acquisition seems to deserve more careful deliberation, because the presentation of a particular word at different stages of acquisition is likely to bring about rather different learning outcome in terms of efficacy.

3.4 Generalization and Intra-lexical Aid

The discussion thus far concerns how learners might discern which object or situation a word is used to refer to in a particular context. This does not address the issue of how learners infer the meaning of a new word more generally, in the sense of applying it to a broader range of referents beyond the original context. It is beyond the scope of this paper to examine the process of generalization[6]; however, how it relates to instantiation needs to be clarified.

As outlined in the beginning of this paper, if one is to acquire target-like conceptual competence characterized by the ability to use a word across an array of appropriate situations, he needs to engage in generalization by means of formation of a more abstract representation such as the image schema postulated by cognitive linguists (Lakoff, 1987; Langacker, 1987). Such cognitive representation is formed by extracting commonalities across a number of specific dynamic experiences (Mandler, 1992). Instantiation plays a crucial role in affecting the potential outcome of generalization by providing the necessary ingredients for such cognitive processing (Figure 9).

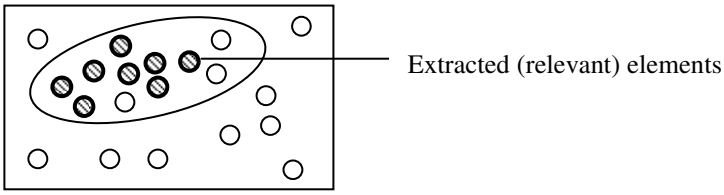


Figure 9 (derived from Figure 5). Extraction of relevant elements from an instantiated situation.

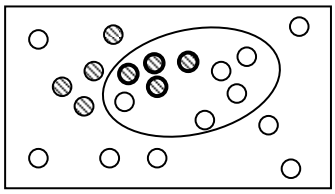
At the stage of instantiation, learners only need to identify the referential situation (by incorporating various relevant elements into perspective) but are not required to identify which elements go with the target word—it is the role of generalization to distinguish relevant elements from irrelevant ones and to extend their applicability[7.] For instance, understanding that *pasokon ga koshou shita* ('the computer is broken') is referring to the situation 'There is something wrong with the computer and Windows does not start at all' not only fulfills instantiation for the context of *koshou suru*, but also for *kowareru* in the context *pasokon ga kowareta* ('the computer is broken').

[6] Consequently, the issue of underuse (Figure 2) is not addressed in the current paper and shall be discussed under the heading of generalization in future studies.

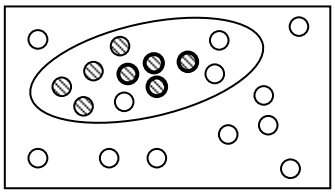
7 The inter-lexical aid described in the previous section may also lend a powerful aid to extraction and generalization (see, e.g., Tomasello, 1992).

Thus, having instantiated correctly does not necessarily lead the learner to knowing that *kowareru* but not *koshou suru* is applicable to a collapsed bridge or a broken box, until he identifies the mechanical dimension of the computer as an element relevant to *koshou suru* and distinguishes other aspects attributable to respective concepts.

In other words, differentiation between words may remain incomplete until the learner undergoes generalization (in which the process of extraction is included). This carries an important implication: learning effect from context should be evaluated with care by taking into account the influence of generalization. For instance if contextual knowledge gained from context were to be measured via a production test, the learner must have engaged in some form of generalization during production (Figure 1), inevitably causing interference in the observed data. This is to say that, even if instantiation is adequate, erroneous production may still arise as a result of inadequate extraction of relevant elements during generalization, albeit presumably at a lower probability compared to when instantiation is incomplete (Figure 10).



(a) Inadequate extraction due to inadequate instantiation



(b) Inadequate extraction occurring during generalization

Figure 10 (derived from Figure 9). Inadequate extraction of relevant elements attributable to different causes.

Hence there is a need to draw attention to the issue that production error—although conventionally attributed to overgeneralization (e.g. Matsuda, 2000; Shirai, 1995; Sonaiya, 1991)—may also stem from instantiation, which is a key factor that has been largely overlooked in the studies of L2 acquisition. These two factors operate in rather opposite directions—instantiation contracts while generalization expands (the scope of referent). The consequence of bypassing the step of contraction is vast—the learner may not be able to achieve target-like performance as the accuracy of gap-filling lies largely in specificity. Thus the success of instantiation is fundamental to (but does not imply) the success of generalization, in the sense that only those elements embedded in the instantiated situation are eligible for extraction and further manipulation. For instance, having instantiated that 'the teacher is being inconsiderate to his students by using difficult technical terms and that such act is giving the students a hard time to comprehend' is a prerequisite if elements such as 'inattentive to the needs of others' and 'causing unnecessary discomfort or confusion to that person(s)' are to be extracted. In contrast to that, with a poor context such as one in example (1), learner will only be able to encode the word *fushinsetsu* in the form of an L1 equivalent i.e. 'badly' due to the poverty of contextual information, inevitably resulting in non-target-like conceptual knowledge.

In Section 3.3, how acquisition of adjacent words assists instantiation of a word has been discussed. Apart from such inter-lexical aid, intra-lexical aid derived from generalized knowledge serves as another possible means to facilitate instantiation. For instance, if a learner was first presented with the context in example (3) followed by example (1), he might be able to utilize the information obtained from the former to instantiate the latter. This requires the learner to go through several steps including (a) identifying the elements relevant to the word *fushinsetsu* from the context in example (3), (b) generalizing it in a way that is applicable to example (1), and finally (c) using the generalized knowledge to instantiate example (1). In this case, instantiation (i.e. the third step) is similar to that described by Anderson et al. (1976, 1978) in the sense that the learner instantiates by drawing on conceptual knowledge, although the learner's conceptual representation at this stage may differ from an L1 speaker's in terms of range of coverage, richness, and accuracy.

The incorporation of intra-lexical aid into the proposed model not only emphasizes the importance of having large amount of context-embedded input, it also allows the incremental effect of learning from context to be

accounted for. Learners may not be able to achieve full instantiation by a single context, therefore further exposure to different contexts is needed to complement one another.

4. Conclusion and implication

Building on a usage-based paradigm, the present study has proposed a framework that accounts for what underlies conceptual competence which is crucial for the accuracy of language use (particularly in production), as well as the mechanisms by which such knowledge is acquired. The theoretical framework proposed is especially significant because 'accuracy' is one of the greatest goals for both L2 learners and teachers. However, many pedagogical practices remain to rely heavily on intuition or personal experience, due to the fact that studies on the related issues have yet to turn to inspect the cognitive aspects (rather than learning strategies) that contribute to the mastery of L2. Such tendency is believed to stem from the prevalent belief that 'an L2 is not acquired from scratch, but merely needs to be "reconstructed" drawing on already established concepts in the L1'. This is exactly why there is a vast amount of literature on the cognitive processes of L1 acquisition, yet completely the contrary in the case of L2 acquisition. The irony is that most scholars are, on the other hand, aware that there are hardly any words in two languages that overlap perfectly, or worse, some words apparently lack an equivalent in another language. All of these issues bring us to none other than a single conclusion: there is a set of mechanisms responsible for L2 acquisition which deserves a systematic theoretical account in its own right, and such model will need to take into deliberate consideration aspects that coincide with and differ from L1 acquisition. The illusion that L2 acquisition merely derives from L1 simply needs to be abandoned.

The present account draws on the notion of instantiation and gap-filling as its supporting ground. By clarifying and redefining the dynamic relationship among various components, the cognitive model helps to illuminate some important SLA issues, particularly concerning the use of context and L1 translation. To conclude, let me begin by reviewing the role of context towards acquiring a target-like lexical competence.

Context provides an essential basis for instantiation. Context plays a vital role in acquisition, in the sense that the amount of contextual information is crucial to the quality of instantiation performed, which in turn determines the accuracy of gap-filling. Learning gains may, however, be affected by a number of other factors, including externally provided meaning as well as internal aids. The proposed model provides a framework for future work to examine the effect of not only context and the properties of definition, but also the impact of prior knowledge especially intra-lexical and inter-lexical knowledge on learning. This may in turn shed light on the research of order of acquisition by predicting the learnability of a particular lexical item or usage. At the same time, the model offers a solution to the dispute concerning whether it is effective to learn in context by arguing that as far as accuracy (of conceptual knowledge) is concerned, learning in context is a must.

The need of instantiation emerges along the course of gap-filling. In the initial stages, the knowledge gap is huge as learners do not have many words in their lexicon. The gap is gradually filled with initially learned words, typically those of high frequency of use (see Nation, 2001). Rote learning of definitions or L1 equivalents may serve as an efficient approach at this stage, because the core issue is to retain as many words as possible within a short period to fulfill basic comprehension and production demands. However, as the learner's lexicon becomes saturated upon having acquired a range of frequently used words (including overuse in some of them), gaps become less easily perceivable and thus the less frequent words become harder to acquire. This shifts the cognitive demand of learning to making fine contrasts between words so as to allow knowledge gap to be filled (via the intake of the new word), at the same time readjusting the boundary of previously learned adjacent words. At this stage, instantiation becomes increasingly important with the increasing need to extract fine-grained meanings (i.e. elements) from context. If the learner continues to resort to rote learning, he is merely strengthening the linking between form and meaning of a word without engaging in gap-filling. The outcome of such approach is none other than vocabulary competence characterized by low accuracy due to the poorly structured conceptual representation. This is not to say that translations should be completely ruled out—dictionary definitions and other explicit forms of meaning continue to play a part in instantiation (although

not exclusively) by providing a guide to help identifying the referential situation.

The model of instantiation carries several important implications for second language teaching and learning. In a foreign language environment in which the opportunity of interactive communication is scarce, input needs to be selected with care in order to foster instantiation. To begin with, materials should be of moderate readability in terms of the density of unfamiliar words, so that learners could make use of the surrounding linguistic context to assist instantiation of the new words. In terms of the content of the texts, the use of familiar topics (or contents that are likely to invoke mutual feelings or past experiences) is desirable as they are conducive to instantiations. At first glance such position may seem to contradict with some studies that argue for the advantage of using unfamiliar topics (e.g. Parry, 1991); however, these studies, again, tend to equate form-meaning retention with vocabulary learning and overlook the need to build up conceptual knowledge. Learning from context can always be coupled with some mnemonic techniques such as the keyword method to yield maximum learning gains, in terms of both conceptual formation as well as form-concept retention. What is more important, learning from context does not imply that learners should focus solely on instantiation (i.e. attention to meaning); rather, they should also notice the forms used to express such meanings at the same time.

Rich contexts such as comics, animations, and dramas facilitate instantiation greatly by providing a vast amount of visual, auditory, psychological, perceptual, and kinesthetic information which is much less tangible when presented in the form of verbal description. In a study conducted by Neuman and Koskinen (1992), the effect of four different settings—captioned television, television alone, simultaneous listening and reading, and reading alone—on the learning of new word was compared, and the captioned television condition was found to be superior to the other conditions. This finding is consonant with the framework proposed in of the present study. The superior learning effect of a captioned television can be attributed to the richness of contextual information combined with the provision of meaning (i.e. the subtitle), resulting in an enhanced instantiation.

In classroom activities, teachers should guide learners in a way that encourages them to instantiate. For instance, newly learned words can be tested by requesting learners to either give or select an example that illustrates the appropriate situation of use. This method induces learners to process and retain the scenario in which the new word was encountered, rather than promoting the learning habits of memorizing an L1 translation or definition. Activities based on the notion of instantiation offer an alternative to the translation method still widely practiced in places such as Japan in which the *yakudoku* ('read and translate') method remains as the dominant approach.

Apart from various input-driven tasks, output-driven activities are equally effective in helping learners to acquire a rich conceptual knowledge, based on a similar rationale. In either cases, the tasks involve the matching of a target word to a specific referential situation, and such process can be facilitated by the same set of factors described in Section 3.2. However, while in an input the learner first encounters the target word and subsequently performs instantiation, it is the exact opposite in the case of producing an output—the intended situation (i.e. the preverbal message) precedes the selection of the target word (see Levelt, 1993). In other words, the former requires the learner to identify the referent, while the latter the appropriate word. What is crucial in these activities is the involvement of communicative acts which entail active and ongoing exchange of meaning. An example of this is the task-based language teaching or learning that focuses on pragmatic meaning (see, e.g., Ellis, 2003).

Learners and teachers should also be aware of the various resources available to assist instantiation. With regard to the type of dictionary ideal for learning, the present paper argues that a definition that is most helpful in instantiation is indeed the most desirable one. This is to say that, the so-called best dictionary may vary from time to time depending on factors such as how far the learner is able to comprehend a definition in L2, and what kind of (or how much) information he needs. Simply put, if an L1 equivalent or an L2 synonym is sufficient to aid instantiate adequately, a detailed and exhaustive definition could be more of a hindrance than a help, and vice versa. Therefore it makes little sense to eliminate the use of bilingual dictionaries simply due to the concern that

learners might be inclined to learn vocabulary through one-to-one equivalents. Such consequence can be avoided by educating learners about the potentials and limits of L1 equivalents, and by promoting instantiation via the above-described procedures.

Other valuable resources include intra-lexical aid derived from multiple contexts. Learners should be encouraged to compare different contexts to build a rich conceptual representation by extracting commonalities from these contexts. CALL classroom, for instance, allows learners to search on the internet for usages that are embedded in meaningful, communicative contexts, in contrast to brief dictionary examples. A carefully selected corpus may serve similar function. Intra-lexical aid also includes the use of morphological information, for instance drawing on prior knowledge on 'in' for a better grasp of the word 'instill', or the suffix -komu for the word oikomu. On the other hand, in order to make use of inter-lexical aids, the teachability or learnability of the target words needs to be taken into consideration. Less frequent words and expressions generally contain more refined meaning (which is what makes the applicable scope smaller) and therefore should be learned upon acquiring the more frequent counterparts.

The procedures discussed thus far are all about how to perform instantiation adequately. This is, however, by no means suggesting that the decontextualized word study method (e.g. paired word list approach) should be completely discarded; rather, it should be used with care as a complement to learning from context. This is not only because definitional knowledge plays a part in facilitating instantiation, but also due to the remarkable effect of such methods on form-meaning retention[8]. In a nutshell, meanings (concepts) are best learned via context while the retention of forms may benefit from various decontextualized vocabulary learning strategies, thus learners and teachers shall make full use of both methods rather than seeing them as a dichotomy.

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