Researching acquisition sequences: Idealisation and De-idealisation in SLA

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Abstract

Idealisation plays a fundamental role in scientific enquiry. This article examines the case for maintaining the claim that the L2 acquisition of grammatical structures such as negation manifests identifiable stages of acquisition. It proposes that while research has demonstrated the need for de-idealisation, there is no need to abandon the idealisation itself. Drawing on work on idealisation in the philosophy of science, it argues that the sequence of acquisition should be seen as a *minimal idealisation* that is of continuing value for the domains of both SLA and, in particular, teacher education. This thesis is explored by examining four studies of L2 negation (Cancino, Rosansky & Schumann, 1978; Schachter, 1986; Berdan, 1996; Van Dijk, Verspoor & Lowie, 2011) which all investigated the same data set. These studies afford important insights about the variability evid.ent in the different stages and, as such, identify the limitations of the idealisation but do not justify its rejection. The article concludes with a discussion of other factors (e.g. the L1 and the role of instruction), the investigation of which may reveal further limitations and thus contribute further to the de-idealisation of the fundamental claim.

Key words; acquisition sequences; L2 negation: idealisation; de-idealisation

Introduction

Early SLA research (e.g. Cancino et al., 1978; R. Ellis, 1984; Felix, 1981; Ravem, 1968; Wode, 1976) provided evidence to show that learners acquire L2 grammatical structures in a series of stages. Predictable transitional constructions were found in acquisition irrespective of the setting or the learner's L1 and age. Some SLA researchers went so far as to propose that learners follow their own 'built-in-syllabus' (Corder, 1967) indicative of the workings of a 'language acquisition device' that regulates how the human mind extracts grammatical information from the input.

Subsequent developments in SLA, however, have challenged the predictability and universality of sequences of acquisition. Watson-Gegeo (2004) and Lantolf (2005) both argued that differences in the social and instructional contexts of learning will result in different developmental profiles in L2 learners. According to this environmental view, L2 development is as much a social as a cognitive phenomenon and, far from being fixed and universal, is 'revolutionary and therefore unpredictable' (Lantolf, 2005, p. 339).

The empirical findings of early SLA research were used to advance a cognitivist view of L2 acquisition. That is, acquisition is conceived as taking place inside the learner's head through the operation of specific cognitive mechanisms that govern how learners process the data available to them. In contrast, socially-oriented theories of L2 learning – such as Conversation Analysis for Second language Acquisition (CA-SLA) - emphasize learning-as-participation and see the social context not just as a source of 'data' but as a site where learning takes place in flight (Firth & Wagner, 2007). The notion of fixed, universal sequences reflecting the learner's built-in-syllabus (Corder, 1967) does not mesh easily with social theories that emphasize the situated and local nature of acquisition (Eskildsen, 2012).

More recently, a further challenge to the claim that L2 development is characterized by identifiable acquisition sequences has come from researchers who view L2 acquisition as a process of constructing complex, adaptive systems (Larsen-Freeman, 2011). These researchers acknowledge the role of universal cognitive operations but also emphasize the differences in developmental trajectories that result from the social interactions that individual learners participate in. Dynamic Systems Theory claims that 'all variables are interrelated and therefore changes in one variable will have an impact on all other variables that are part of the system' (de Bot, Lowie and Verspoor, 2007, p. 8). It emphasizes that systems are constantly changing and therefore that L2 development is unpredictable. Like socially-oriented accounts of L2 acquisition it postulates that L2 development is 'embodied' (i.e. cognition is not bounded within the individual but is socially constructed) and 'situated' (i.e. cognitive functions can only be understood in terms of the particular setting in which they are carried out). This theory, too, challenges the existence of pre-determined sequences of acquisition.

Clearly, then, there is a need to re-evaluate the long-held claim that the acquisition of L2 grammatical features involves predictable and universal stages of development. The position I will take in this article is that the notion of 'stages of development' constitutes an idealisation. I will draw on work in the philosophy of science that has examined the nature of and the need for idealisation in scientific enquiry to argue the case for maintaining the long-held claim that L2 acquisition is characterized by universal, fixed sequences of acquisition.

Learner-language is highly variable (R. Ellis, 1985; Tarone, 1988). At any particular point in their development of an L2 learners are likely to deploy several linguistic devices for realising the same grammatical structure. Thus the essential question becomes 'To what extent is it possible to claim that there are identifiable sequences of acquisition given the high level of variability evident in the data on which this claim is based?' SLA research on sequences of acquisition in the last forty years has involved the de-idealisation of an initial idealisation. I will argue that while it is important to identify the limitations of and constraints on an idealisation this does not necessitate the complete abandonment of the initial idealisation. The quotation from Hooker (1994) that prefaces this article constitutes a statement of this position. I begin with a brief account of the various constructs and methods that have figured in research on developmental regularities in L2 acquisition. This is essential if we are to have a meaningful debate about the nature of these regularities.

Developmental regularities in learner language

As Ortega (2014) pointed out, SLA researchers have often followed Selinker's (1972) advice by pursuing description prior to explanation. There is, however, no one way to set about describing learner- language (Ellis & Barkhuizen, 2005). Below I outline the different methods that researchers have employed to investigate developmental regularities in L2 acquisition from the early research in the 1970s up to the current time. These different methods involve different ways of analyzing learner language and correspondingly different ways of conceptualizing the route that learners follow.

Order of acquisition

Early SLA research was informed by L1 acquisition research (e.g. Brown, 1973), which found evidence for a consistent pattern of development, and by the hunch that a similar pattern would be found in L2 acquisition. It investigated the order in which learners achieve mastery of different linguistic features. Mastery was defined in terms of the learner's ability to produce specific grammatical forms with target-like accuracy in obligatory contexts with the 80% or 90% criterion level taken as indicating mastery. The morpheme studies of the 1970s (e.g. Dulay & Burt, 1973; Bailey, Madden &Krashen, 1974) reported a relatively fixed order of development for a group of English morphemes (e.g. V+ing, reg. past tense, 3rd person-s). However, the majority of these studies were cross-sectional in design and equated acquisition order with accuracy order. The problems with such an approach are now well-known – it takes no account of the U-shaped pattern of development evident in at least some grammatical features or of the considerable fluctuation in accuracy in learners' use of a specific morpheme over time [1]. Investigating the order of acquisition ignores what is arguably most essential in understanding L2 acquisition - the gradual, variable and dynamic process by which specific grammatical forms are mastered. I will have nothing further to say about the order of acquisition, which I consider of little theoretical interest.

Sequence of acquisition

Researchers conducted longitudinal studies to document how both syntactical features (e.g. negation) and morphological features (e.g. English regular past tense) are acquired gradually as learners pass through a series of stages, each characterized by a different 'transitional construction' (Dulay, Burt & Krashen, 1982). Thus, development is not conceptualized in relation to target-like accuracy but in terms of whether learners progress from an early transitional construction to a later one. The method employed to investigate sequences of acquisition is frequency analysis (Ellis & Barkhuizen, 2005). This involves selecting a specific linguistic feature for study (e.g. negatives or relative clauses), identifying occasions when learners attempt to use this feature and documenting the various linguistic devices they employ and how these change over time. Investigating the sequence of acquisition of different grammatical structures arguably provides a much more valid account of how learners develop as it avoids the comparative fallacy (Bley-Vroman, 1983). Importantly, it is able to show that development can take place even if the learner has not achieved mastery of the use of a feature.

Frequency analysis involves a high level of idealisation. Learner language, especially in the early stages, is characterized by the use of formulaic chunks such as 'I don't understand' and 'I don't know' which appear to show that the learner has reached a relatively late stage in the development of L2 negation but in fact show only the learner has learned these as fixed lexical units. When researchers like Cancino et al. (1978) set about investigating sequences of acquisition, they elected to eliminate formulaic chunks from their data set on the grounds that the sequence would only become evident in samples of learners' creative speech (i.e. utterances that have been freely constructed out of separate linguistic units). In this article, I will be mainly concerned with the sequence of acquisition and discuss in what ways it constitutes an idealisation.

Developmental sequence

Researchers in the Zweitspracherwerb Italienischer and Spanischer Arbeiter (ZISA) project (e.g. Meisel, Clahsen & Pienemann, 1981) identified a clear developmental pattern in the acquisition of L2 German. This research differed from the research on sequences of acquisition. The developmental sequence consisted of a series of steps with each step characterized in terms of the different grammatical forms (morphological and syntactical, target-like and non-target-like) that 'emerged' at the same time [2]. The steps in the general developmental sequence incorporate transitional constructions that figure in the acquisition of specific word order structures such as negatives (see Table 2 in Ortega, 2014, for an example of the steps involved for negation in the developmental sequence). However, work on the developmental sequence adopted a very different way of deciding whether a specific grammatical form had been acquired. Acquisition was said to have occurred if a learner manifested the use of a new grammatical feature just once in a non-formulaic utterance (i.e. in terms of 'onset').

The early descriptive work on the developmental sequence segued in time into a formal theory - initially the Multidimensional Model (Meisel et al., 1981) and later Processability Theory (Pienemann, 1998), both of which explained development in terms of the processing strategies that constrain which grammatical forms the learner can produce in each step. Developmental sequence research also entails a high level of idealisation not least with regard to the legitimacy of onset as the measure of acquisition (see Hulstijn, 1987).

Vertical and horizontal variation

The sequence-of-acquisition research showed that there is considerable variability within a specific stage of development. Each stage is defined in terms of the linguistic device that is dominant at that time but other devices, with different frequencies, also figure at that same stage. The question arises, then, whether this variation is or is not significant for understanding L2 acquisition. In the 1980s, researchers (e.g. Tarone 1983; R. Ellis, 1985) started to draw on sociolinguistic models to investigate to what extent the variability evident in learner language was systematic or random. Thus whereas previously researchers had focussed on investigating acquisition across time (i.e. vertical variation), these researchers focused on the variation at a specific point in learners' development (i.e. horizontal variation). They showed that both the social and linguistic context impacted on the use that learners made of the devices available to them both at a single point in time and over time. They also proposed that horizontal variation served as a precursor of vertical variation. A key finding of this line of enquiry was that the devices learners selected were strongly influenced by whether the data reflected careful or casual speech, raising the possibility that the vertical sequence of acquisition itself might vary depending on the types of language use reflected in the learner-language samples that were collected (see Tarone & Liu, 1995).

Form-function mapping

Variability in learner-language can also arise because learners may use different linguistic devices to realise different functions in communication. Linguistic systems are not just formal in nature; they are also functional. Thus a less-idealised account of the systems that learners construct will need to investigate the form-function mappings that learners construct at different points in their development. There is no one-to-one correspondence between form and function in target language systems. The same form can realise different functions and the same function can be realised through different forms. If learner systems are also 'natural' systems, the same is likely to be true for L2 systems. From this perspective, then, a more complete and theoretically sound description of the route that learners follow requires an examination of the form-function mappings that learners construct at specific points in time and how these mappings change over time. This can be achieved by means of either form-function analysis (i.e. examining the functions realised by a specific linguistic form) or by function-form analysis (i.e. examining the different forms used to realise a specific function). Systematicity becomes evident if it can be shown that there is an identifiable set of

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correspondences between form and function. Schachter's (1986) study – one of the studies I will consider in more detail later – adopted this approach.

Usage-based learning and trajectories of acquisition

It is questionable whether the distinction between formulaic chunks and creative speech is as clear cut as Cancino et al. (1987) assumed. Usage-based accounts of L2 development (N. Ellis, 2002) seek to document how complex adaptive systems evolve over time. They claim that linguistic development starts with chunks, which subsequently evolve into schematic templates allowing for utterances to be creatively constructed. In other words, early formulaic chunks constitute a formative stage in the acquisition of a grammatical feature and should not be excluded from the analysis. Usage-based accounts emphasize the variability and non-linearity inherent in the development of any specific linguistic feature. Studies that have adopted a usage-based methodology trace all the uses of specific linguistic features over time by examining the interactional contexts in which the features appear (Eskildsen, 2012). Researchers operating in this tradition reject the existence of clearly delineated stages of acquisition and also emphasize the differences in the L2 development of individual learners. In other words they appear to dispute the two essential claims of what Lantolf (2011) has called the Universal Acquisition Hypothesis, namely that the stages of development are (relatively) fixed and that they are universal. However, usage-based accounts of L2 development acknowledge that there are 'trajectories of learning', raising the important question as to how 'trajectories' differ from 'sequences'.

These different approaches to investigating L2 development clearly involve different levels of idealisation. The level of idealisation involved in cross-sectional order-of-acquisition studies is of very a very high order, which arguably makes this approach to investigating L2 development of very questionable value [3]. Sequence-of-acquisition studies represent a lower order of idealisation; they document learners' variable attempts to produce a grammatical structure and they acknowledge the transitional nature of L2 acquisition. However, they arbitrarily distinguish between 'formulaic' and 'creative speech' and pay little attention to the context of use. Studies that have drawn on the notions of vertical and horizontal variation are less idealised in that they acknowledge the importance of variability in learner language and seek to account for it in L2 development. Similarly, studies of form-

function mapping operate from a less idealised model of what language (including learner language) consists of. Usage-based studies provide the least-idealised account of L2 development. Thus we can see in these different approaches how idealisation gave way to de-idealisation over time.

Idealisation and de-idealisation in scientific enquiry

SLA, like any other area of scientific enquiry, seeks to demonstrate that the conclusions it draws about the nature of L2 acquisition are rational. That is, it aims to develop theories that can explain L2 acquisition and to show that these theories are valid by demonstrating that they are robustly supported by empirical evidence. This uncontroversial statement about the goal of SLA, however, raises some necessary questions: (1) What exactly is a theory? (2) What is the process by which theories are developed? (3) What constitutes robust empirical evidence? My main concern is with questions (2) and (3) and the important role that idealisation plays in answering these but to begin with I will briefly consider (1).

Reynolds (1971, as cited in Long, 1985) distinguished two different types of theory; theories that consist of a set of laws that provide generalisations about a phenomenon (L2 acquisition in our case) and theories that are axiomatic and causal process in form and thus go beyond description to allow for predictions to be made about a phenomenon. These two types of theory involve different lines of enquiry. In the case of a set-of-laws theory, the approach is inductive and empiricist. That is, the approach is research-then-theory. In the case of an axiomatic-causal theory, the approach is deductive and is 'rationalist' in procedure. The approach is theory-then-research. This dichotomy is, of course, simplistic. Research-then-theory cannot take place without some theoretical understanding of the phenomenon under investigation. Researchers of any kind must necessarily be selective in what they choose to investigate and selection necessitates some a priori conceptualization of what is important. Similarly, although some theory-then-research may be initiated by deep, armchair thinking, in many cases the theoretical premises that inform the research are drawn from an inspection of the results of earlier inductive research. Nevertheless, the distinction is useful. In SLA we can see a historical progression from research that was primarily inductive and descriptive to research that was increasingly deductive and hypothesis-testing. For some this represents evidence of the increasing maturity of the field.

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I will not have much to say about axiomatic-causal theories in this article. My focus is on set-of-laws theory. This is not because I see no value in axiomatic-causal theories but simply because the body of research I am interested in has resulted in a set of descriptive statements about the acquisition of one grammatical structure - negation - and the generalizations about the sequence of acquisition that this research has given rise to. Thus the research I will be examining is of the research-then-theory kind, which Long (1985) characterized as involving the following:

1 Select a phenomenon and list all its characteristics.
2 Measure all the characteristics in as many and as varied situations as possible.
3 Analyse the resulting data by looking for systematic patterns.
4 Formalize significant patterns as theoretical statements (the laws of nature).

It should be evident that this accurately captures much of the SLA research on acquisition sequences. Researchers began by choosing a phenomenon to investigate (e.g. negation), they obtained samples of learner language, extracted those utterances that were negative in form and measured (or rather described) their characteristics, looked for systematic patterns in the way negative devices were used, and finally arrived at a generalisation about the sequence of acquisition. By way of example of the kind of 'law' that resulted consider this statement from Long's (1990) list of the 'well-established findings' that a theory of L2 acquisition needs to explain:

> … learners of different ages, with and without instruction, in foreign and second language settings, follow similar developmental sequences for such items as English negation. (p. 659)

Long, however, was careful to hedge, noting that 'generalizations are only possible when empirical observations are repeatedly supported' (p. 656) while also acknowledging that some variation in developmental sequences occurs due to the learners' first language. Long's generalisation constitutes an idealisation. It is time now to examine what an 'idealisation' consists of and the role of such idealisations in scientific enquiry.

What is an 'idealisation'?

An idealisation is a statement about a phenomenon that 'simplifies the description of real systems, and at the same time, engages in some formal mathematical apparatus, the two combining to produce theories that are initially intelligible and practically manageable while

remaining empirically accurate within acceptable limits over salient ranges of conditions' (Hooker, 1994, p. 206). From this definition, we can see that an idealisation has a number of characteristics;

* it constitutes a simplification (i.e. it does not account for the full complexity of a phenomenon)
* it must be theoretically tenable (i.e. there must be a rational basis for proposing it)
* it must be intelligible (i.e. the terms it employs must be properly defined))
* it must be 'practically manageable' (i.e. it allows for empirical verification)
* it must be empirically accurate to a degree (i.e. it can account for the characteristics of the phenomenon but not necessarily for all characteristics of the phenomenon).

Nowak (1992) captured the essential nature of an idealisation in this way – 'the idealisational law is an ideational statement which neglects all the factors claimed, truly or not, to be secondary' (p. 20). It is an intentional introduction of distortion into scientific theories (Weisberg, 2007). An idealisation, then, does not claim to be fully rational or to provide a fully legitimate account of a phenomenon. As such, then, it constitutes a challenge to researchers to demonstrate that it lacks legitimacy because it ignores an important factor or is not empirically supported, or because it has no relevance to the particular domain they are interested in.

Types of idealisation

Weisberg (2007) distinguished three kinds of idealisation:

1. *Galilean idealisation* involves deliberatively introducing a distortion into a theoretical law in order to simplify it to make it 'computationally tractable'. Galileo was interested in investigating the effect of the weights of objects in a medium devoid of resistance but, given that it was impossible to access such a medium he elected to compare the movement of objects in the thinnest and least resistant media with what happens in less thin and more resistant media. In this way, the idealisation served to make empirical investigation possible. Weisberg commented that this type of simplification is justified pragmatically. Later we will see evidence of this kind of idealisation in studies of L2 negation.

2. *Minimalist idealisation* involves formulating statements that include only core factors (i.e. those factors that make a difference). Such statements are termed 'canonical' and

are aimed at accounting for universal patterns of behaviour. They allow for more detail to be provided later. Such detail, however, does not improve the general description or explanation of the behaviour but merely affords a more thorough characterization of highly specific events. Whereas Galilean idealisations abate as science progresses, minimalist idealisations persist. Later I will argue that Long's 'well-established finding' regarding developmental sequences constitutes a minimal idealisation.

3. *Multiple models idealisation* involves building multiple and incompatible accounts of a phenomenon, each of which makes distinct claims about its 'true' nature. The underlying assumption here is that there is no single best account of the phenomenon as researchers have different goals in terms of accuracy, precision, generality and simplicity and will consequently trade-off one desideratum against another. Weisberg argued that a high degree of generality, accuracy, precision and simplicity could only be achieved by constructing multiple models of a phenomenon. Arguably, this is what we can see happening in the four studies of L2 negation I consider in the next section.

The central issue, however, is whether it is possible to show that a minimal idealisation – of the kind Long proposed - underlies these multiple models of L2 negation. Again, I will argue that it is.

Simplifying and degenerate idealisations

Two importantly different kinds of idealisations can also be found in science (Hooker, 1994). Simplifying idealisations are 'those idealisations that, from our deepest theoretical perspective, continue to represent nothing more than correctible simplifications, in which the unidealised (or anyway less idealised) theory is relevantly approximated by the idealised one' (p. 207). In other words actual behaviour can be represented as corrections to idealised behaviour. Degenerate idealisations, on the other hand, are not just quantitatively inaccurate but also represent a conceptual inaccuracy in the resulting theory (see example below). However, Hooker argues that both types of idealisations have a role to play in science. He acknowledges that the explanatory goal of science is to achieve theories that explain all the evidence in their domain and to do this as 'precisely, simply, and ontologically penetratingly as possible' (p. 213). The purpose of idealisations is to simplify or remove structure in order to make prominent one or more of the principles in the theory. Successor theories (i.e. theories that are broader in the explanatory scope) 'will then be able to explain the evidence

that the idealised theory could explain by recapturing these principles as (idealised) special cases' (p. 213). Hooker argued that this is straightforwardly so for simplifying idealisations but is also true of degenerate idealisations. By way of example, he notes that the successful explanations provided by Newton's laws of motion, which in themselves constitute a degenerate simplification, can be taken over into relativity theory. He concludes 'on the grounds of pursuing explanatory adequacy, we require scientific idealisation to be recaptured (even as degeneratively special cases) in their less degenerate counterpart theories, resulting in idealisations acting as external cases or constraints on acceptable less idealised theories' (p. 215). In other words, idealisations constitute both a necessary starting point and also a constraint on theory development.

What constitutes an acceptable idealisation?

Idealisations, then, are fundamental to scientific enquiry. Jordan (2003) wrote 'idealisations are warranted because they help to focus on important issues and to get rid of distractions' (p. 152). The question arises as to what constitute acceptable idealisations. We can approach this question in two ways. First, we can try to identify a general set of evaluation criteria for determining the representational ideals of idealisations. Second, we can acknowledge the domain relevancy of idealisations and recognize that what constitutes an acceptable idealisation in one domain may not do so in a different domain (i.e. we will need to accept that there are multiple models each with its own set of idealisations).

Weisberg (2007) lists the representational ideals that can serve as a basis for the evaluation (and the development) of theoretical models (including the kind of law that I am concerned with). He proposes that there are inclusion rules that specify the properties of the phenomenon of interest and fidelity rules that concern the accuracy and precision of the different parts of the model (i.e. specific laws). He then shows how different types of idealisation (see above) are associated with different representational ideals. Galilean idealisations fall short of the representational ideal of 'completeness' although the Galilean idealizer does aim at a complete and accurate representation in the long-term. From this perspective, achieving completeness is an ongoing process. Completeness is in fact antithetical to idealisation which by definition entails some form of simplification. Minimal idealisation aims to specify only the factors that make a difference. It draws on what Weisberg calls the 1-causal representational ideal which requires than the idealisation only

captures the primary or causal factors of significance (i.e. make a difference) for a given phenomenon. In the case of multiple models idealisation, no single representational ideal is applicable as it allows for different models each of which is guided by different representational ideals.

Multiple models idealisation assumes that there is no single idealisation that can fully capture all the observed behaviour relevant to a phenomenon. That is, it adopts a pluralist stance. This position is compatible with what I have argued elsewhere (Ellis,1995), namely that theories (and the idealisations that constitute them) can only be judged in terms of the specific domain they address. As I put it, 'a theory is constructed to meet the needs of a particular group of consumers' (1995, p. 87) and therefore it is unwise and irrational to attempt to evaluate theories without reference to the context in which they were developed and, in particular the purposes they were intended to serve. I went on to propose that a necessary condition for applying a theory to a domain other than that for which it was devised is the demonstration of relevancy. Thus, if we wish to judge the legitimacy of idealisations we need to consider the theoretical context in which they were framed and the purposes that shaped their formation. In effect, this amounts to accepting that all knowledge is subjective and reality is multiple (Schumann, 1983).

De-idealisation

So far I have focused on idealisation and argued that its plays a key role in rational scientific enquiry. However, idealisations are not set in stone. A simplifying (or degenerate) idealisation can be either modified or abandoned, as part of the process of scientific enquiry. As Schumann (1993) noted, abandonment is rare in SLA as researchers are adept at immunizing their statements (i.e. idealisations) in order to protect them. Modification, however, is more common. This leads us to consider the process of de-idealisation.

De-idealisation is most clearly applicable in the case of Galilean idealisation which is premised on the assumption that pragmatic idealisation will lead to future de-idealisation and more accurate representation of a phenomenon and therefore will be subsequently replaced. In the case of minimal idealisation, de-idealisation takes the form of specifying the constraints of and limits on the idealisation but does not require the abandonment of the idealisation itself. That is, the idealisation can still be considered valid even though it does not capture all the complexity of a phenomenon. Similarly, in multiple models idealisation,

de-idealisation involves examining the constraints and limits of the idealisations that inform each model but without any intention of arriving at a single de-idealized model.

Summing up

This discussion of idealisation in scientific enquiry reveals that (1) idealisation is a key feature of all scientific enquiry. As Hooker (1994; 215) pointed out:

> *… on grounds of pursuing explanatory adequacy, we require scientific idealisations to be recaptured (even if as degeneratively special cases)in their less degenerate counterpart theories, resulting in idealisations acting as external cases or outer constraints on acceptable less idealised theories (Hooker 1994, p. 215).*

The discussion has also shown that (2) there are different types of idealisation, which are motivated by different goals and draw on different representational ideals, (3) an idealisation is contextual and thus needs to be examined in relation to the domain (purpose) it addresses (4) demonstrating the constraints on and limits of an idealisation does not necessitate its rejection unless it can be shown that the idealisation ignores a primary factor.

I conclude this section with this further observation from Hooker (1994) – 'the costs of the attempt to be more rational in some respect outweigh the benefits that could be obtained from it'. In other words, an incomplete or inexact idealisation may still be of benefit to its domain. With this thought in mind, I will return to an examination of the idealized claim that there are (relatively) fixed and universal sequences in the acquisition of grammatical features by examining four studies of L2 negation.

Four studies of L2 negation

Ortega (2014) provides a comprehensive account of research on L2 negation in SLA. She distinguishes that research which was essentially descriptive in nature (i.e. of the research-then-theory kind) from that which was theoretically grounded (i.e. of the theory-then-research kind). My concern here is only with the former and not with all the studies of this type. I have elected to examine the role of idealisation and de-idealisation in four studies all of which draw on the same data base. These four studies are all descriptive and are representative of

four of the methodological approaches and their accompanying conceptualizations that I considered earlier – 'sequence of acquisition', 'vertical and horizontal variation', 'form-function mapping', and 'trajectories of acquisition'. I will begin by describing the nature of the samples of learner language that figured in these studies and then provide a brief summary of each study.

The data base

The data-base is described in Cancino et al. (1978). It consisted of the English negative utterances produced by six native Spanish speakers – two children aged five, two adolescents aged 11 and 13 and two adult learners. All these learners had been in the US for less than three months at the start the study. Data were collected twice monthly for an hour over a period of ten months. Three methods were used:

1. Recordings of spontaneous speech where one of the researchers engaged the learners in conversations.
2. Experimental elicitations in which the learners were asked to imitate or negate model utterances.
3. Recordings of pre-planned sociolinguistic interactions (e.g. at parties, restaurants, museums and sports events) designed to provide samples of speech in varied natural situations.

The recordings were transcribed in a standard format based on the Slobin manual (Slobin, 1967).

One point to make at the onset is that these samples of learner language were drawn from very different contexts of language use. In particular, there is a clear difference between (1) and (3) on the one hand, both of which involved communicative language use, and (2) on the other which involved the conscious manipulation of language. It is also likely that there were differences between (1) and (3), the former resulting in (perhaps) samples of relatively naturally occurring language and the kind of language derived from what Corder (1976) termed clinical elicitation, which is not to be confused with the experimental elicitation in (2). A second point to make is that although the interactions between the learners and the native speaker researchers were transcribed, the negative utterances were extracted from these interactions and considered in isolation from the interactional contexts in which they occurred.

1. Cancino et al. (1978)

In analysing the data, Cancino et al. first attempted to writes rules for the L2 negatives but abandoned this because 'the constant development and concomitant variation … made the task impossible' (p. 209). Instead, they catalogued the various negative devices (*no, don't, can't, isn't* etc.) at each point in time and determined the proportion of each negating device in the total number of negatives produced by each learner. Before doing this, however, they eliminated the utterances they considered to be memorized wholes (e.g. 'I don't know' and 'I don't think so') and also restricted the data set to proposition negating utterances (i.e. they did not include verbless negative utterances). They then plotted the frequencies of the different negative constructions on graphs for each learner. This enabled them to identify when each negating device was first used and the extent to which it was used in relation to the other negating devices. They arrived at a general developmental sequence which they claimed was the same for all the learners:

1. No V
2. Don't V
3. Aux-neg
4. Analyzed don't; disappearance of no V.

However, not all the learners had progressed through all the stages by the end of the study. Thus, there were clear differences in the rate of development. One of the learners – Alberto – demonstrated no development, leading one of the researchers (Schumann, 1978) to claim that he had fossilized [4]. Schumann also reported that his attempt to teach Alberto negatives had some effect on his production of elicited negatives but none on his production of spontaneous negatives.

2. Schachter (1986)

Schachter conducted a function-form analysis of one of the two adolescent learners in Cancino et al. (1978). Jorge, like the other learners, manifested the four general stages of acquisition shown above but unlike most of the other learners he deployed all four forms from the third taping session through to the end at which point the earliest form (no + verb) disappeared. Schachter rejected the possibility that the variability evidence in Jorge's use of the four forms was due to situational constraints as she argued that these were held constant throughout [5] and proposed instead that their use was systematically related to the different

functions they served. In contrast to Cancino et al., who analysed isolated negative utterances, Schachter examined them in their interactional contexts. She also elected to consider phrasal and whole utterance negation, not just sentential negation. In other words the data base for her study was notably more complete than that for Cancino et al. First, Schachter identified two basic stages in Jorge's negative development. The first stage consisted of preposing 'no' before some other element (a verb, a noun, a prepositional phrase and 'more'). The second stage was characterised by the advent of new negative forms (don't V, can't V, nothing, not really), which appeared abruptly in tape 5 and then developed progressively. Schachter then demonstrated that Jorge's use of these new negative forms was systematic by examining the different functions they served. She identified seven functions (non-existence, rejection, denial, no information, correction, affirmation and quantification) and then investigated which forms mapped on to each function. She concluded 'Jorge exhibits surprising regularity in his pairing of forms and functions, with a strong tendency to associate with each function a very limited set of syntactic forms and to associate with each syntactic form a very limited set of functions' (p. 131). Clearly, this analysis of the data affords a much more complete and detailed picture of Jorge's use and development of English negation. Schachter argued that 'if we are to capture the richness of the learner's achievements, the task of the analyst must be correspondingly complex' (p. 131).

3. Berdan (1996)

Like Schachter, Berdan (1996) sought to demonstrate that the learners' negative forms were systematically variable. In his study, however, he investigated the relationship between horizontal variation and vertical variation by drawing on the methodology of variational sociolinguistics. Alberto manifested only two of the four stages identified by Cancino et al. – no +V and don't + V. Berdan coded all Alberto's negative utterances in terms of both time and a number of contextual factors including the subject noun phrase (i.e. whether each negative utterances contained (a) no subject NP, (b) a 1st person singular pronoun, (c) some other pronoun or (d) another NP) and style (i.e. whether the negative utterances were produced in spontaneous conversation or in experimental elicitation). The main findings were (1) that while no uniform increase in the use of 'don't' was apparent overall it changed from the less likely to the more likely variant over time, (2) utterances with no subject NP were the least likely to employ 'don't', (3) while there was no significant main effect for style, 'don't' increased significantly in elicited utterances over time (i.e. there was an interaction involving

time and style). Berdan reached two conclusions. First, there was systematic variation in Alberto's choice of negator. That is, both linguistic context and style affected Alberto's choice of the more advanced 'don't + V' over time. Second, Alberto was in fact a language acquirer and had not fossilized over time. Berdan commented 'that Alberto evidences change is incontrovertible, and his change is in the direction of the target language' (p. 237). The lesson that Berdan drew from this study was that in order to understand how development occurs it is necessary to model language acquisition as continuous change over time rather than as a series of successive stages as in Cancino et al. Berdan's study utilized frequency analysis but it showed that the kind of simple frequency count of basic linguistic devices carried out by Cancino et al. had failed to reveal significant patterning in their data.

4. Van Dijk, Verspoor & Lowie (2011)

Van Dijk et al.'s study also focused on the variation inherent in learners' choice of negative forms. Although theirs was also still essentially a descriptive study it was theoretically grounded in Dynamic Systems Theory. As with other usage-based approaches, Dynamic Systems Theory views an L2 system as a complex adaptable system. In variational sociolinguistic research – such as Berdan's study - variation is seen as fundamentally systematic. In contrast, in Dynamic Systems Theory, variation is seen as chaotic at least sometimes (i.e. it is unpredictable) and as constituting evidence of ongoing change. However, although change in a system is constant, a system may temporarily settle into 'attractor' states that are relatively stable. Van Dijk et al. (2011) noted the essential difference between the way variability is viewed in traditional sociolinguistic approaches and in Dynamic Systems Theory. The former 'have been mainly interested in discovering external causes of variability' whereas 'a DST approach is interested in variability to discover when and how changes take place in the process of development, how different subsystems develop and interact, and how different learners may have different developmental patterns' (pp. 60-1).

Van Dijk et al. (2011) reanalysed the data from Cancino et al. This analysis, which involved a variety of sophisticated statistical methods for examining the use that the six learners made of the negation strategies revealed the following:

- The developmental curves for the individual learners investigated were quite different from the averaged curve for the whole group. In other words inter-learner differences

were pronounced.

- Two of the learners investigated in detail displayed equal levels of variability but whereas in one of the learners the variability was essentially random in the other a significant 'peak' was evident at a given stage of development suggesting that this learner had settled into an attractor state.

Van Dijk et al.'s re-analysis of the data, therefore, challenges Cancino et al.'s claim that there was a distinct sequence in the acquisition of English negation. It also suggested that different variability patterns reveal different kinds of development. Free variation occurs when no or very little development is taking place whereas the presence of a significant peak in a learner's use of a specific grammatical feature signals that the learner is ready to accommodate new constructions. They also noted that the patterns of variability of the six learners differed according to their age with the children taking longer to produce peaks in the use of non-target forms than the teenagers and the adults failing to show peaks to the same extent as the teenagers. In other words, the pattern of variability differed according to the age of the learners.

Summing up

These four studies of L2 negation are comparable in that they all drew on the same data base. They are spread out over four decades and in many respects reflect the developments that have taken place in SLA over this period. Cancino et al. (1978) used the methodology of L1 acquisition researchers to examine whether a similar sequence of acquisition to that reported for L1 acquisition was evident in L2 acquisition. Schachter (1986) addressed the variability inherent in the data for one of the learners by investigating how specific forms mapped onto specific functions in a systematic way. Berdan (1996) drew on the methods of variational sociolinguistics to examine both horizontal and vertical variation and the relationship between them. Finally, Van Dijk et al. (2011) provided evidence to show that much of the variability in the learners' use of negative devices was random but that 'attractor states' emerged from time to time. They also claimed that the learning trajectories of the six learners differed. Thus, all four studies acknowledged the presence of variability in the data but they differed markedly in how they handled it and the conclusions they reached.

Idealisation and developmental sequences in SLA

Long's (1990) 'well-established finding' regarding developmental sequences is repeated here for convenience of the ensuing discussion:

> … learners of different ages, with and without instruction, in foreign and second language settings, follow similar developmental sequences for such items as English negation. (p. 659)

The key question is whether and in what ways this 'law' remains valid and useful for SLA today. To try to answer this I will return to what the philosophy of science has had to say about idealisation and de-idealisation. I take note, however, of the fact that the four studies of L2 negation I considered in the previous section do not enable all the parts of Long's finding to be examined. They only investigated learners in second (not foreign) language settings. Also, only one of the learners (Alberto) received instruction and that of a very limited kind. However, the studies do allow consideration of learners of different ages. It should also be noted that Long claimed that developmental sequences are 'similar' not 'the same' and that some L1-induced variation can occur.

Long's law is clearly an idealisation. It constitutes a **simplification** as it does not account for the full complexity of the phenomenon. In particular, it does not address the nature of variability within a developmental sequence, which all the four studies of L2 negation I have considered showed is profound. Is it **theoretically tenable**? I would argue that it is in so far as everything that we know about the nature of L2 (or L1) acquisition is that it is a gradual process and that to make sense of this process we need to consider the phases that characterize it. All the four studies viewed the acquisition as a process and differed only in how they characterized the phases. Long' claim is also **intelligible** but clearly differences exist in how best to define 'developmental sequence' and, in particular whether this entails an ordered series of transitional constructions as proposed by Cancino et al. (1978). Is it **practically manageable**? Long's claim clearly allows for empirical validation. A striking feature of all four of the studies is that they identified the same set of negating devices and they all utilized some form of frequency analysis. Finally, is it **empirically adequate**? Here we need to bear in mind that an idealisation does not need to account for all the characteristics of a phenomenon. Clearly Long's law does not do so. It is, however, with regard to this characteristic of an idealisation that Long's law is challengeable. Van Dijk et al. (2011), for example, provided empirical evidence to suggest that 'learners of different ages' do not follow the same trajectory. Again, though, we can ask

whether there is sufficient commonality in the six learners to still claim that the developmental sequence is 'similar' for all learners. In sum, Long's law clearly does not account for all that we know about L2 negation but I will argue that there is no clear reason for abandoning it as an idealisation. It satisfies Hooker's (1994) definition of an idealisation presented earlier.

We saw that Weisberg (2007) distinguished three kinds of idealisation. Long's law can be seen as a kind of Gallilean idealisation. We can see several different ways in which deliberate distortion was introduced in the early research on acquisition sequences to make the empirical investigation of a sequence of acquisition for L2 negation tractable. Cancino et al. (1978) – a study that Long must have had in mind when he formulated his law – eliminated formulaic sequences from the data they analysed, ignored the variability inherent in the data, and also took no account of the interactional context of the learners' negative utterances. The result was a highly idealized set of 'stages' defined in terms of the dominant negative construction evident at different times. Given the methodological tools available at that time (i.e. those available from L1 acquisition research which Cancino et al. modelled their study on) such distortions are not just understandable but, arguably, were helpful as they resulted in a clear statement of the staged nature of L2 negation that prompted the subsequent research that uncovered the distorting factors.

Weisberg's (2007) second type of idealisation is minimalist idealisation. This involves formulating statements that only include core factors (i.e. those that make a difference). As we noted earlier, such statements aim at accounting for universal patterns of behaviour but allow for more detail to be added later. Long's law might be best seen as minimalist but only if it can be shown that the details available later (i.e. in the post Cancino et al., 1978, studies) do not require a major reformulation of the law. Schachter's (1986) study can justifiably be seen as providing more detail without challenging the fundamental idea of a developmental sequence. It simply recasts the stages of development in terms of form-function systems. Berdan's (1996) study also does not challenge the fundamental claim that no + V form constitutes an initial stage in Alberto's speech with 'don't + V' assuming greater prominence towards the end of the data collection period. However, Berdan did provide some useful additional detail (e.g. Alberto's choice of linguistic forms was systematically influenced by

the nature of the data, whether 'conversation' or 'elicited'). Alberto was more likely to deploy 'don't + V' in the elicited data collected in the latter half of the study. This suggests the need to amend Long's law by adding '…in naturally occurring speech' [6]. Berdan also showed conclusively that Alberto had not fossilized but this does not in itself constitute a challenge to the fundamental claim that there are stages of acquisition; it merely disputes Schumann's (1978) claim that some learners may cease learning before traversing the full set of stages. Van Dijk et al. (2011)'s study constitutes the most substantial challenge to Long's law in that it claims to have provided evidence that learners of different ages follow different developmental paths in the acquisition of L2 negation. However, Van Dijk et al. acknowledged that 'there seem to be very general "stages" in the sense that in certain periods, certain constructions are more frequent' (2011, p. 67) and that 'learners will go through construction one before two, two before three, three before four' (p. 68). They emphasized that the 'stages' are not discrete – a point that Cancino et al. were also careful to make. Arguably, then, their study does not justify any fundamental change to Long's minimal idealisation. It simply substitutes the notion of 'attractor states' for 'stages'. In short, Long's law holds up remarkably well.

Weisberg's (2007) third type idealisation involves building multiple and incompatible models. SLA is, of course, replete with multiple and incompatible models with researchers frequently insisting on the legitimacy of their own favoured model and immunizing it against counterfactual evidence. Clearly, Schachter (1986), Berdan (1996) and Van Dijk et al. (2011) all drew on different models of language but all three models acknowledge the fundamental stage-like nature of development and differ only in how they conceptualize this. The differences lie in how they account for the variability evident in each stage (e.g. whether it is systematic or chaotic) and in how they set about investigating this variability. Schachter views variability in terms of form-function mapping. Berdan draws on a sociolinguistic model that views variability in language use as inherently systematic. Van Dijk et al. emphasise the chaotic (i.e. 'free') nature of variability in accordance with Dynamic Systems theory. In terms of how they handle variability, therefore, these models might be seen as incompatible. But they are all compatible with Long's law.

Hooker (1994) distinguished 'simplifying' and 'degenerate idealisations'. This distinction

goes to the heart of the issue. Is Long's law to be seen as an example of a simplifying or degenerate idealisation? The drift of my arguments in the preceding paragraphs leads to the conclusion that it is a simplifying idealisation in that it constitutes a correctible account of idealised behaviour rather than entailing a fundamental conceptual inaccuracy. However, if we follow Hooker's line of argument, even if it is argued that Long's law is degenerate, there is no need to abandon it as we strive towards a more explanatory law. Rejection of Long's claim is only possible if we can conclude that it is in fact not an idealisation of actual behaviour at all. And, as I have attempted to show, it clearly is. The descriptive details provided by Berdan (1996) and Van Dijk et al. (2011) can be seen as affording empirical evidence that flesh out the fundamental idealisation that L2 learners follow similar developmental sequences by demonstrating that differences exist among learners within each stage of the sequence. Following Weisberg (2007), Long's minimal idealisation draws on the I-causal [7] representational ideal in that it seeks to capture the primary factor of significance while ignoring secondary factors.

In fact, what we can see at work in these four studies of L2 negation is the process of de-idealisation. We can see this most clearly in the way in which the same data are handled in the four studies. Cancino et al. (1978) idealised their data by aggregating data collected in different ways, by discounting formulaic sequences, and by taking no account of the interactional context. The later studies offered more complex analyses of the data by removing these limitations. The de-idealisation reflected in these studies consisted of the progressively detailed examination of the variability inherent in the data.

I suspect that there will be SLA researchers who will reject the arguments I have put forward so far in support of Long's law. They may wish to argue that it constitutes an over-simplification or that, in the interests of completeness, it needs to be abandoned as it has taken insufficient account of an important factor (Jordan, 2003) – variability. I would argue, however, that even if this can be convincingly demonstrated, there is still a need for the kind of idealisation that Long's law represents. My own interest in SLA was and still is motivated by my concern to find ways in which instruction can be made compatible with how learners learn. I seek to present the findings of SLA in such a way that they are accessible to those who practice instruction – teachers – and to those who train them – teacher educators.

Idealisations necessarily play an important role of achieving this. Long's law serves this purpose well. It appeared in an article that was published in *TESOL Quarterly*, a journal that offers an interface between research and teaching. It affords a clear and simple statement about a key finding in SLA that teaching clearly needs to take account of. In the domain I primarily work in (SLA for teacher education), the idealisation represented in Long's law (with the addition that it only applies to natural language use) is of obvious value. Hooker (1994) pointed out at that a theory of formal logic is of little value in helping someone decide what to do if they suddenly came across a lion. Similarly, I suggest, that the account of L2 negation provided by, for example, Dynamic Systems Theory, is of little help to teachers faced with teaching negation. Long's law, however, arguably is. In the domain of applied SLA (as opposed to theoretical SLA), idealisations such as Long's law are contextually justified.

Conclusion

I need to conclude with a few caveats. I have restricted my investigation of Long's law to four studies that examined the same data produced by the same six naturalistic learners with the same L1 background. In effect, then, I was not able to examine all the parts of Long's law.

It remains a possibility that learners in a foreign language setting who have limited access to input and interaction in the L2 will not conform to the law. Eskildsen (2012) reported a study that suggested that the classroom learners he investigated did not follow the attested sequence. The two learners he investigated manifested both no +V and don't + V right from the beginning of his study. However, these learners were not complete beginners and thus it remains a possibility that 'no +V' did appear first in their L2 negatives. My own study of L2 negatives in a classroom setting (R. Ellis, 1984), which did investigate complete beginners, found that all three learners started with no + V.

It also remains a possibility that developmental sequences are not immune to instruction. Social theories of L2 acquisition (e.g. sociocultural theory) dispute the Universal Acquisition Hypothesis by claiming that the acquisition of linguistic forms is situated and local and is mediated through social interaction and thus not governed by developmental readiness on the

part of the learner. I would point out, however, that to demonstrate this it will be necessary to show that instruction removes the need for learners to progress through stages. Simply demonstrating that instruction enables learners to perform a specific linguistic form more accurately (i.e. in accordance with target language norm) will not be sufficient. Ideally, then, what is needed are longitudinal studies of the effects of instruction that examine what effect it has on communicative language use (i.e. learners' proceduralized/ automatized/ implicit L2 system; see Note 5). Whether instruction does change the sequence of acquisition remains a matter of controversy with some studies (e.g. Ellis, 1984; Pienemann, 1984) suggesting it cannot and other studies (e.g. Spada & Lightbown, 1999) indicating that, to some extent, it can. Zhang and Lantolf's (2014) paper in this special issue also provides evidence to suggest that acquisition sequences are not immune to instruction. If there is sufficient evidence to demonstrate that instruction can subvert the 'natural' developmental sequence then clearly some modification of Long's law is needed. However, even if this eventually proves to be the case, the law can still hold for untutored acquisition.

I have also not considered whether the sequence of acquisition evident for the six Spanish learners is evident in learners with different L1s. Clearly this will be necessary to claim that the sequence is universal. Long (1990), it will be recalled, acknowledged that there are some differences due to L1 background. There are two possibilities. One is that the L1 interacts with the universal sequence but does not fundamentally change it - as argued, for example, by Wode (1981) and, in this special issue by O'Grady (2014). The other is that the sequence itself will alter when learners take as their starting point the L1 structure. Also of interest is whether equivalent stages are evident in the acquisition of different L2s. Some research (e.g. Bernini, 2000; Klein & Perdue, 1997) indicates that this is the case. O'Grady (2014 and Pienemann (2014) – in this special issue - see natural processing constraints as determining L2 development and, accordingly, envisage major commonalities in sequences in acquisition across L2s.

Idealisation in the form of a simplified law about the existence of developmental sequences in L2 acquisition constitutes a challenge to researchers – a challenge that has been taken up in recent usage-based studies (e.g. Eskildsen, 2012; Hauser, 2013). It serves, therefore, an important role in SLA by serving as a basis for testing competing theories which differ

ontologically in the position they take. Arguments will continue as to whether such an idealisation is unwarranted and therefore should be abandoned or whether, in combination with a specification of the constraints and limits (i.e. de-idealisation), it can continue to represent actual behaviour. I have argued for the latter position. Let us not throw out the baby with the bathwater and let us also acknowledge that as SLA researchers we operate in different domains and that simplified laws may still hold relevance for some of these domains even if in others they are deemed untenable. In this respect SLA researchers have much to learn from the philosophy of science.

Notes

1. In fact, longitudinal studies (Hakuta, 1976; Rosansky, 1976) demonstrated that there was variation in the order of development at different times and also in the order in which English morphemes reached the criterion level.

2. A somewhat similar approach to characterizing the developmental sequence can be found in the European Science Foundation Project. Klein and Perdue (1997) distinguished three broadly defined varieties in the naturalistic acquisition of different European languages by immigrants – the Pre-Basic Variety, the Basic Variety and the Post-Basic Variety, each characterized by a specific kind of utterance organization.

3. Longitudinal studies of the order of acquisition are of greater value as they document how accuracy in the use of specific grammatical features varies over time. See, for example, Jia and Fuse's (2007) study of 10 Chinese ESL learners.

4. In fact Schumann did not take a rigid view regarding fossilization. Schumann (personal correspondence) suggests that fossilization too might be considered an idealization. He points out that a less idealized construct is 'stabilization' and also a prolonged 'attractor state'.

5. Schachter's (1986) assumption that situation constraints were not a factor is unjustified. First, the data investigated language use in a variety of natural situations, which potentially could have influenced the learners' linguistic choices. Second, it included clinically elicited utterances, which clearly do represent a different 'style'. Berdan's (1996) study showed that there was systematic variation according to style.

6. The claim that there are sequences of acquisition for grammatical features such as negation needs to be restricted to data that reveals learners' proceduralized/

automatized/ implicit knowledge. There is no evidence to support the claim that acquisition sequences are evident in data that reflects learners' declarative/ controlled/ explicit L2 knowledge.

7. I-Causal refers to a representational ideal that instructs the theorist to include in the model only the core or primary causal factors that give rise to the phenomenon of interest.

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