From Language Aptitude to Implicit Language Aptitude: A Discussion of Definitional Issues

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"Heinrich Schliemann, the renowned 19th century German archaeologist and excavator of Troy, was born in 1822 … Heinrich Schliemann learned eighteen languages with relative ease and considerable speed … Within six months he learned to speak and write English; in another half year he became fluent in French. In order to acquire the same fluency in Spanish, Italian, and Portuguese, he needed in each case only six weeks. At the age of twenty-two he spoke seven languages: German, Dutch, English, French, Italian, Spanish, and Portuguese" (Jahn, 1979, p. 275).

Linguistic geniuses such as Heinrich Schliemann have long fascinated many with their exceptional capabilities to master multiple languages on top of their own mother tongues. These individuals are believed to be able to extract the probabilistic, abstract patterns underlying a target form's linguistic and frequency distribution in second language (L2) input—often with considerable efficiency and effectiveness. In the study of Second Language Acquisition (SLA), interest in such remarkable talent for picking up languages is by and large undertaken by the notion of "language aptitude" and its corresponding strands of research.

That said, language aptitude remains one of the most confounded constructs in L2 individual differences research, especially from a definitional point of view. Consider the definitions below:

a. "[Language aptitude refers to] an individual's initial state of readiness and capacity for learning a foreign language, and probable facility in doing so given the presence of motivation and opportunity" (Carroll, 1981, p. 86).

b. "[Language aptitude refers to] cognitive abilities [that are] predictive of the learning rate and ultimate attainment in a second language" (Li, 2020).

c. "[Language aptitude refers to] the kind of ability adults draw on to learn a second language" (Li, 2019, p. 82).

d. "[Language aptitude is] a catch-all, umbrella term to refer to cognitive and perceptual abilities that contribute to high achievement in language learning" (Granena, 2020, p. 1)

As may be inferred, among the many confusions are:

(1) Is language aptitude a trait or an inferential set of conditions (cf. (a) and (b))?

(2) Should language aptitude be defined in terms of the acquisition process or the acquisitional outcomes (cf. (a), (b), (c), and (d))?

(3) How does language aptitude as a construct differ from "language capacity" (cf. (a), (b), and (d))?

More importantly, while definitions (a) to (d) all imply some involvement of cognitive abilities, there exists no consensus as to what those specific cognitive abilities are (e.g., domain-general and/or domain-specific, implicit and/or explicit), and whether abilities other than those that are cognitive (e.g., the perceptual abilities mentioned in (d)) are relevant as well. Such divergence in definitions has rendered language aptitude a somewhat incomparable construct across empirical studies, thereby undermining the credibility of this line of research at least in part. As Granena (2020) puts it:

> "… researchers are still trying to put together all the pieces regarding the theoretical constructs that are relevant components of aptitude for L2 learning and processing and regarding the type of contribution they make to language learning" (p. 1).

One such endeavor over the past decade has been to break away from the confines imposed by the traditional approach to researching foreign language aptitude, which revolves around the use of early aptitude test batteries such as the MLAT (Modern Language Aptitude Test (Carroll & Sapon, 1959). Because of its behaviorist origins, the traditional approach focuses primarily on the learner's rote memory and language analytical ability, thereby treating language aptitude as largely "explicit" (Granena, 2020; Li, 2019). In the wake of a more nuanced understanding of how languages are learned within the field of SLA (e.g., N. Ellis, 1996; Long, 2017; Williams, 1999), "implicit language aptitude" emerged as a cutting-edge notion that continues to gain sway in L2 individual differences research (e.g., Granena, 2013, 2016; Yi, 2018). Below are a few select definitions:

e. "Implicit language aptitude refers to cognitive abilities for the unconscious computation of distributional and transitional probabilities [in L2 input]" (Li, 2020).

f. "Implicit language aptitude is conceptualized as the ability to recognize and acquire patterns underlying the input through implicit induction" (Yi, 2018, p. 5).

g. "Implicit language aptitude can be defined as those cognitive abilities that facilitate implicit learning and processing of an L2, understanding by 'implicit' in the absence of (1) conscious intention to learn, (2) conscious awareness of the fact that we are learning, and (3) conscious attribution of any noticed change to the effects of learning … Once stimuli are selectively attended, with relatively low-level perceptual attention, implicit learning can occur automatically without engaging any additional executive processing resources" (Granena, 2020, p. 7).

Compared with their generic counterparts for language aptitude from (a) to (d), the three definitions of implicit language aptitude from (e) to (g) above appear to have some improvement. For one thing, common to (e), (f), and (g) is the agreement that implicit language aptitude pertains to cognitive abilities exclusively—putatively to the exclusion of perceptual abilities (cf. definition (d) for language aptitude generically). For another, definitions (e) to (g) treat implicit language aptitude as neither a static trait nor a predictive set of conditions. Instead, they all take implicit language aptitude as input-processing capabilities. Clearly, there exist more common grounds across the definitions (e) to (g) than their counterparts for language aptitude from (a) to (d).

This is not to say that definitions (e) to (g) for implicit language aptitude are without issues. First, how "implicitness" is being characterized in these three definitions is evidently problematic, although in starkly different ways. In (e), implicitness is considered equivalent to "unconsciousness," following the traditions of cognitive psychology (Bargh & Morsella, 2008). In this sense, unconscious information processing is equated with *subliminal* information processing—which essentially implies that the learner is unaware of the *stimuli* (as opposed to the *mental processes* involved). Paradoxically, considering that the remaining segment of (e) corresponds to the computation of distributional and transitional properties, it is logically impossible that the learner is unaware of the linguistic stimuli (i.e., input) in the first place. In this sense, "subconscious computation" might be a more precise term to use as it relates to (e).

Though rightfully suggesting that it is the mental processes involved of which the learner is unaware, both definitions (f) and (g) suffer from the problem of circular reasoning. That is, implicit language aptitude is defined as being "implicit" in one way or another. In (f), implicit language aptitude is conceptualized by way of "*implicit* induction." In (g), implicit language aptitude is deemed relative to "implicit learning and processing of an L2." Even though (g) goes on to relate "implicitness" with "selective attention" in the subsequent half of the same paragraph, the fact that there is evidence of circular seasoning still holds.

Another issue with definitions (e), (f), and (g) is that they conflate with multiple other core concepts/constructs in not only L2 individual differences research but also SLA research in general. Another thoughtful look at (e) should reveal that without the introductory segment "Implicit language aptitude refers to," "cognitive abilities for the unconscious computation of distributional and transitional probabilities" serves as a valid definition for "statistical learning capabilities" as well. Similarly, the segment "the ability to recognize and acquire patterns underlying the input through implicit induction" in (f) can putatively be used to define the notion of "grammatical sensitivity." As for (g), it remains unclear how implicit language aptitude as defined therein differs from its close correlate of "implicit language learning abilities." The fact that implicit language aptitude potentially overlaps with other existing concepts or constructs in SLA begs a more fundamental question. That is, to what extent does the addition of "implicit language aptitude" serve to clarify or intensify existing confusions regarding L2 language aptitude research?

Besides the problem of conflation, other persistent issues that have loomed the construct of language aptitude have apparently been carried over to the notion of implicit language aptitude as well. One is whether implicit language aptitude should be defined in terms of the acquisition process (see (e) and (g)), the acquisitional outcomes (see (f)), or a combination of the two. Decisions as such are not merely a matter of definitional scope or focus; they have practical implications for what is permissible and what it is not with respect to operationalization. Yet another is whether implicit language aptitude involve strictly cognitive abilities only, as is defined in (e), (f), and (g). Just because implicit language aptitude constitutes one of the two types of cognitive language aptitude does not necessarily mean that perceptual abilities vis-a-vis pattern recognition or affective predispositions such as the learner's emotional intelligence are irrelevant by default.

Taken together, it appears that one way to come up with a thoughtfully conceived and consistently falsifiable definition for implicit language aptitude is to return to the origin and start afresh in search of a compatible theoretical basis. To that end, the connectionist approaches to SLA, which are founded upon the metaphor that the mind is a network in which everything is connected (e.g., Li & Zhao, 2013; Westermann et al., 2009), seem to make a strong candidate.

The following postulations of the connectionist approaches look especially promising in filling some of the gaps and holes unaccounted for by extant conceptualizations of implicit language aptitude as it relates to L2 input- and information-processing: (1) connectionism seeks to explain how associative patterns of form, meaning, and use emerge in the learner; (2) connectionism sets forth how language is processed in the brain by means of learner-internal computational devices; (3) strong connections in the mind-brain are correlated with high linguistic and frequency distribution found in the input, and vice versa, ceteris paribus; (4) the activation of connections varies according to the strength acquired through the brain's application of supervised and unsupervised learning algorithms. Researchers interested in researching implicit language aptitude might therefore want to give a closer examination of the conceptual underpinnings of the connectionist approaches and determine the extent to which they can be used as the theoretical foundation to unify and clarity the notion of implicit language aptitude.

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