A Classroom and Teacher Self-efficacy: Affordances for the Instructional Speech

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keywords: instructional speech (IS), teacher self-efficacy (TSE), attention schema theory (AST), affordance, social brain

0. Introduction

Life is a long-lasting habitat formation and habituation. Education to a human agent is a habitant construction and an update of habituation. Language instruction is an enterprise for a speech construction and habituation of the linguistic performance in a local context. One of the most significant researchers whom we should consider on this point is a linguist and an educational philosopher, Prof. Leo. van Lier (1944 – 2012), a distinguished researcher to language education. With considerable research conducted from a socio-ecological perspective, he viewed language education as something that permeates agents afforded by the environment. In the epilogue of his book called, “The ecology and semiotics of language learning,” van Lier (2004) raised an issue that we have not sufficiently considered the close connection between language and language education, stating that “all education—indeed all learning, as Halliday (1993) asserts—is permeated by language” (p. 221, emphasis by the author).

Van Lier’s work is indeed a successful and significant description of the educational environment. The approach to education, including models of various aspects of language, semiotics, and ecology, however, appears focusing on a theory of language learning but not one of language teaching. I mention “teaching” here to emphasize that, apart from a curriculum and the development of learning contents, teacher and learner (the agents) construct education altogether via classroom events emerging in and out of the social brain. The social brain is composed of teacher and student’s brain, as well as all events in the language classroom. Such events nonetheless allow teacher brain for functioning as a buffer or an enhancer of the immediate classroom phenomena in tandem with student brain. I discuss the bilateral mechanism of such events and the neural and cognitive connection of them to teacher behavior, based on several models that I think are of most importance to language teaching and teacher development.

Ecologically speaking (I use the term “ecology” as a transdisciplinary scientific approach to language education), the relationship between teacher and student are complementary in the classroom. It bears the same relation to them that a caregiver does to a child. Hence, some issues
remain unsolved: to identify the neuroscientific, cognitive, and social, mechanism of classroom teaching, or to create an ecological model of education in the local classroom. A challenge for the issue will expand the view so that it might contribute to language education. The study is one such challenge.

The study first identifies the context of instructional speech (IS) in Japan to point out the issue about why teacher seems to suffer dilemmatic speech between Japanese and English in a local classroom (Chapter 1). Next, it applies Bandura’s (1997) triadic reciprocal determinism to the specific three events: teacher self-efficacy (TSE), IS, and classroom (Chapter 2). Third, in a link between affordance and social brain, I introduce the brain’s two-phased function which we experience explicitly or implicitly: respectively, physical mechanism of attention, and mental mechanism of awareness (Graziano, 2013), where neuronal, cognitive, and social function of the brain eventually affects the agentic behavior (Chapter 3). Finally, I apply Graziano’s model of awareness to the practice of a co-constructive feedback loop (Chapter 4). The paper concludes that TSE works and fits well as a robust enhancer of the feedback loop towards the sustainable and growing enterprise in language education (Chapter 5).

The aim of the study was: (1) to introduce IS and TSE to forge a significant link between behavior and cognition from language teacher’s point of view, and (2) to draw a path of awareness enhancement (from conflicting to efficacious, from implicit to explicit) by incorporating affordance theory into a model of subjective information-processing experiences called attention schema. The attention schema theory (AST, Graziano, 2013) gives a key concept to the language-teacher development in Japan because it suggests how one can alleviate a conflict through controlling awareness to Japanese, becoming instead more aware of the significant engagement in English.

1. Context: Instructional Speech

Instructional speech (IS) refers to language-teacher behavior caused by the attention, awareness, and the entire brain action in the language classroom. The IS in English class is drawing an increased number of concern in Japan, since MEXT (2011) announced the English-only policy in the revised guideline of Education Ministry, which stipulates that teachers at secondary schools “should conduct the class in English in order to enhance the opportunities for students to be exposed to English” (Section 8). To this end, however, the local climate shows a mixed IS pattern with the lack of detailed guidance to control Japanese. Omote (2017, 2018), for example, revealed that teacher’s quantified Japanese ratio to English in secondary schools is 7 : 3 on average. Other research has shown that identifying an optimal balance of the IS goes elusive (e.g., Turnbull & Dailey-O’Cain, 2009). Meanwhile, there are few programs of teacher development available for the optimal reduction of Japanese toward a non-biased balance of Japanese ratio to English.
Some researchers attribute the issue to the low linguistic (English) proficiency of the local Japanese speaker teacher or the entrance examination (e.g., Nishino, 2012). The alternative explanation is that teachers pragmatically feel Japanese more efficacious than English for student’s understanding and motivation, such as in clarifying grammar points, or in controlling a classroom situation (Omote, 2012; Yamato et al., 2013). To determine the opportune reduction of the first language (L1) use is then a key to exposure to and processing in English.

One thing is for sure; a problem appears to rest with a conflict that teachers experience in unlearning L1 to convey more meaning in English (L2) (Omote, 2018). On top of this, the conflict is hardly dispensable but fully persistent. L1 use goes typically unnoticed, since L1 processing, ruled by the in-process physical mechanism, is often unaware. Take an example of a successful class that functions well—in Japan, Japanese permeates all parts of school communication by teachers and students. It would be natural to assume that this shared L1 environment should give a dominant exposure and successful opportunity to choose Japanese. Research suggests that teacher and student embrace overdependent engagements in the L1 (Turnbull & Dailey-O’Cain, 2009). The classroom agents do not necessarily unlearn but overlook the L1 use.

No research has yet to agree on whether compensatory L1 use can affect L2 processing (Schmidt, 2010). There is an old and new dispute of how a teacher should incorporate the L1 into the classroom, despite the hindrance of L1 to L2 learning. The bottom line is that we have no clear answer about how a teacher can reduce the choice of L1 explicitly (compensation) or implicitly (overlook) by optimizing the effect on language (L2) learning. I assert that the key to the solution should consist in the fluctuant sense of awareness in teacher cognition (self-efficacy) and the interplay between subjective sense (self-awareness), behavior (IS), and the classroom environment (teacher and student’s feedback loop).

2. The Triadic Events: TSE, IS, and Classroom/Brain

Teacher self-efficacy (TSE) refers to the teacher’s awareness of beliefs about how much the teacher efficaciously affects learning (Faez & Valeo, 2012; Ghonsooly & Ghanizadeh, 2013). Based on social cognitive theory (Bandura, 1997), Omote (2017) states TSE fluctuates between choices of L1 and L2, and the most influential factors of the fluctuation were student feedback (verbal and non-verbal motivational signals to teacher) and teacher’s awareness of mastery experience (successful communication, experiences of entrance examination by the teacher).

Bandura (1997) described a human agency in the causal relationship between personal cognition (P), behavior (B), and environment (E). The model represents three significant events being reciprocally dependent on each other. If we reframe the causation into the framework of language teaching, the three events go with TSE, IS, and Classroom/Brain. This adapted model (Figure 1, left
triangle) appears matching for what research has mentioned about the language classroom. TSE and IS interplay with each other, creating diverse patterns in the context (Omote, 2012, 2017); the speech between teachers may vary depending on teacher cognition and school environments, such as individual difference, goal, school policy, or other settings (Duff and Polio, 1990); it does so even in a single teacher over time (Erstdrom, 2006).

![Diagram](image)

**Figure 1** Triadic Reciprocality in teacher (left) and student (right)

The effect is reciprocal. In other words, the opposite direction of effect may exist. It is mainly because the events are provoked intrinsically and extrinsically in human subjectivity—attention and awareness in the agent’s brain—namely, from the classroom/student brain to TSE (E>P), and from TSE to IS (P>B). Thus, TSE plays a pivotal role in both directions in a way to soothe conflict because teacher acts as a buffer to enhance one’s teaching effect, optimizing the feedback loop via IS (Omote, 2017). For instance, extrinsic compunction caused by a situation where student’s L1 overuse looks harmful to goal setting, the teacher may change from L1 to L2 speech, and in the similar vein, teacher feel a sentiment of guilt in a moment when he or she reserves the L2, which leads to student demotivation, and disappointment of the teacher as well (Cook, 2001; Edstrom, 2006). In effect, research has almost agreed with a soothing/enhancing effect on a mixed sense of guilt caught unawares by changing IS from the spoken one into the other, as in the case of successful compensation (L1) available in the situation of misunderstanding (Cook, 2001), or of casual communication pop up (L2) to ignite motivation successfully (Littlewood & Yu, 2011).

However, research knows little about what is happening within the teaching brain, the implicit neuronal process of ecological, physical, and cognitive, mechanism while teaching. The mechanism might be involved with several relevant cognitive and neuroscientific highlights regarding the following connections, such as one between affordance and selective attention (e.g., phonological discrimination), between attention and a bundle of awareness—so-called the mind-body problem (Humphrey, 2011), between awareness and motor action (e.g., speech muscles affecting speech production), or a connection of self-awareness with the looped-back behavior from the other.
In the following chapters, I challenge these highlights with a new relational (cubic) model, whose primary concern is the development and growth in a local context with a depth put to the former triadic model: namely, (1) the relational information as affordances, (2) mutual exposure to speech, and (3) updating awareness. The depth links to a growth model of educational agency and events, which I believe shed light on the present research question pointed out above.

3. Affordances, Speech, and Awareness

The Theories. Affordance theory defines affordances as what “is available to the person to do something with.” Affordances are relations, which “directly signal their relevance for a person in a particular situation” (van Lier, 2004, p. 91). They are not material, non-physical, nor mental, but a relation to the environment, occurring exclusively between the physical and the mental. It is something noticed, something we are aware of in a context. It is an endless number of opportunities available for the brain to pick up when we act in a specific environment. Affordances are related to billions of brain action when it creates meaning. It is “action potential” (van Lier, 2014, p. 92).

Attention schema theory (AST) (Graziano, 2013) specifies brain action as information processor between the physical and the mental. It bases “attention schema” for a unique by-product of the brain’s mechanical action through selective attention. This by-product, the attention schema, is by definition awareness. The brain works via neurons. As the brain pays attention to something in and out of itself—for instance, sentiment for the former and vigilance for the latter, it reduces neuronal actions to a bunch of self-representation. Neural processing is not ordinarily explicit per se, but the brain can be self-aware of some of the processes. It is from the procedural information—from the implicit to the explicit—that AST extrapolates awareness. The naming of the theory is a little problematic, however, since “schema” typically means an outline of a plan, not a planning action. Graziano states that “[a]wareness is a description of attention,” meaning the describing procedure of attention (p. 23). Attention schema, therefore, refers to awareness as a sketch of attention by mechanical brain function. Awareness is a describing brain.

Affordances in Context. In a language classroom, affordances can be a social, bilateral relationship that sparks significant connections, roughly speaking, between teacher brain and student’s brain, both acting and affecting each other in “classroom/brain (E)”. At first sight, this depiction looks odd in that each agent is not physically an environment but a person of a single brain in the shared (L1) environment. According to social cognitive theory (SCT), however, the interpretation of triad is not physical but one agent's individual events. In such a framework, the external agency subsists as an environmental event to one’s brain: if P represents student self-efficacy (SSE), then B does learning speech (LS) (Figure 1, right), and E classroom/teacher brain. The relation is entirely true to the causation between TSE, IS, and E (student brain/classroom)
(Figure 1, left).

The above model is feasible enough to depict the following characteristics of language education and instruction. First, education is multidirectional between the triadic events, permeated by every kind of speech sign one uses—primarily, exposed to the early-stage symbols, such as in phonetics, phonology, or morphophonology. Second, language instruction is a unique environmental opportunity with some social, neural, and cognitive processes of selective attention, representation, and awareness. Third, a thriving (successful) habitat for education—take teacher, for example—would interplay with both the self-awareness from the inside (teacher’s brain) and relevant affordances from outside (student brain/classroom). Such a person optimizes personal events ($P$, $TSE$) and the behavioral events ($B$, $IS$) towards the meaningful growth (planning, goal setting, acting, this explained later, see Figure 2).

**Awareness in Speech.** Van Lier (2004) distinguished the role of acoustics from speech forms (e.g., syntax, word), stating that it is a “direct perception, that is, the immediate noticing of certain characteristics of speech... as first-level affordance [sic].” (p. 221). The acoustic aspect of speech that affects the cochlear, such as frequency or amplitude, connects teacher-to-learner brain mechanism in the physical property where affordance is related to awareness (e.g., psychoacoustics). Then it may also be true that teacher-student brain interplay occurs offhand at the earliest stage of attentional process to the voice acoustics. This initial process would be conveying more information than we are generally aware because it mechanically (or implicitly) occurs before the brain sketches it as our awareness (Graziano, 2013). A bunch of information (e.g., tone, rhythm, pitch, sentiments, and contingencies) affects the connection in the brain circuitry, but most of them are under implicit process since the brain does not allow us yet to be explicitly aware, and because we do not need all of them (e.g., formant transition) for L2 interplay. The general situation is the same as what happens to the events in a class other than the L2 classroom. However, the specific situation might be slightly different in the language classroom because IS requires novice learner's brain mechanism to engender new categorical habituation of phonological awareness corresponding to the target (English), which brings the agent cognitive trouble. For example, phonological awareness can have a significant impact on self-efficacy from the reciprocal effect between IS ($B$) and the monolingual English classroom ($E$). Take an example of Japanese learner’s difficulty in discriminating /l/ and /r/ phonemes. Novice Japanese learners will confront deficiency ($P$) (Goto, 1971). Phonological awareness, in other words, a sense of difficulties in the task of processing unfamiliar speech sound, is often explicitly exaggerating but implicitly unprocessed or hindered by the linguistically homogeneous (L1) classroom environment, although the trouble is not innate nor insuperable in education; researchers have documented many successful cases of intervention (e.g., McCandliss, et al., 2002).
Motivation is of importance to a teacher. Speech involves in the issue how, and why, we speak. TSE for a language teacher is not only for maintaining a tool (L2 understanding) or compensation (motivation) but also for obtaining the goal (conveying meaning in L2). Thus, a language teacher speaks to teach for directing into the goal successfully, as well as giving direction. For a teacher to maintain TSE (a vital sentiment of a teacher of course), one needs becoming zero in on a sort of “prolepsis,” or an expectation that will “create invitational structures and spaces for learners to step into and grow into” (van Lier, 2004, p. 162). The idea of prolepsis goes hand-in-hand together with the issue of TSE and teacher development because both emphasize the importance of the awareness of goal setting. Shortly, successful teaching means to be one’s being aware of self-efficacious time and space, where he or she is successfully speaking over time with overall efficacious feedbacks from the classroom (O mote, 2017). Then, how can a teacher feel efficacious and catch the sense that his or her student is efficacious at the same time? To answer the question, I apply neuroscience to the local situation.

4. The Relational Model and Teacher Development

The updated model (Figure 2) represents that growth is a relational increment of the social brain. This second model is an extended version of the adapted reciprocal causation model explained above. In the model, the triadic variables, TSE, IS, and Classroom interplay between each other over an extended period. Theoretically, the first model does not say much about the timing of development; it only explains the constituent effect within the triadic relationship in a single agency represented by a person (P). The assumption is that, for an agent brain to grow, one needs the other agent(s). The former model represents a sheer event involved in one brain at a time but not in a social brain or two interplaying brains. The model, therefore, depicts a dualistic—or, geometrically, cubic with a new dimension of depth and growth—relational causation between $P_1 \leftrightarrow P_2$ (self-efficacy [TSE] $\leftrightarrow$ self-efficacy [SSE]), $E_1 \leftrightarrow E_2$ (classroom/student brain $\leftrightarrow$ classroom/teacher brain), and $B_1 \leftrightarrow B_2$ (instructional speech [IS] $\leftrightarrow$ learning speech [LS]). The social brain is changing into the temporal expansion of (1) discovered Affordance, improved Speech, and updated Awareness, (2) developing into Growth made up of the relational increment of social brain ($F_1$) (depicted by the enlargement of triangular prism in Figure 2).

$$\text{expansion of eventual depth} \quad \text{relational increment of social brain}$$

$$\text{Growth} = \{\text{Affordance} \times \text{Speech} \times \text{Awareness}\} = \{P_1 \leftrightarrow B_1 \leftrightarrow E_1\} + \{P_2 \leftrightarrow B_2 \leftrightarrow E_2\} \quad F_1$$

The eventual depth, therefore, represents that: Affordances are changing discovery of the relationships between brains over time; Speech is a behavioral improvement by the increased
exposure of IS to classroom/brains; Awareness is being in the ongoing neuronal process of update by the social brain (see the model of formulaic expression in $F_1$ and Figure 2).

The combination in each event ($E_1 + E_2$, $B_1 + B_2$, and $P_1 + P_2$) maneuvers a relational change of Affordances, Speech, and Awareness respectively. The view may offer a diachronic perspective, such as a linguistic change for an extended period and biological purpose. In a classroom environment, however, the model helps zero in on a short-range change at agent-to-agent level, which is meaningful to human behavior, as well as a neuronal and representative action. At the neuronal level, affordances nonetheless exist via the mechanistic organ—social brains. In other words, the model represents a bunch of meaningful procedures of how affordances emerge as relation and how they are picked up by the interplay between social brains over time.

The social-brain model is helpful to answer the question presented above, “how can a teacher feel efficacious and catch the sense that his or her student is efficacious at the same time?” Take an example of phonological awareness in Japan again, at the primary stage of language class, where no information about valid discriminative awareness is available and not even ready for being picked up because it is unknown, or unfamiliar. The following subjective events show exemplifications of a change of affordances between social brains, as it enhances awareness gradually. The targeted information will be /l ≠ r/, and the initial /l = r/; these construct the early affordances, boosting the psychoacoustic states of awareness that either these phonemes are the same (/l = r/) or different (/l ≠ r/). The former is normally a default state to Japanese-speaker student agency studying English, and it is often a default state to an English teacher as well until he or she pays much attention to it. If affordances in the classroom are a null stage, there is no update of awareness, no meaningful speech in a sense that there is no distinctive phonemic interplay (/l ≠ r/), then no pick-up of affordance. Initially, therefore, there is no selective attention in social brains. Below is a simulation of how a
feedback loop should emerge (listed in order from a to l):

a. \( tb: /l/ = /r/ \) → no seed available → no interplay,
b. \( tb: /l/ \neq /r/ \) or \( tb_s: /l/ \neq /r/ \) → no interplay.

The codes above and hereafter represent a unique state of brain and awareness: \( tb \), teacher’s brain being aware of TSE; \( sb \), student's brain being aware of SSE; \( tb_s \), teacher's brain being aware of the efficacy in the SSE; and \( sb_t \), student's brain being aware of the efficacy in the TSE. Also, the combination of question marks and equal marks indicate the degree of being aware. Each shows an increment of being aware of the inequality (/l/ \( \neq /r/ \)), as the number of question marks goes down as follows: not aware (??), a little aware (≠?), almost aware (≠), and aware (≠).

Theoretically, the reason for the null status is likely in condition either the teacher has never been aware of the phonological event (a. teacher's brain, \( tb: /l/ = /r/ \)—albeit this highly unlikely, or the brain is in a state of being non-available for some reasons at that exact moment (b. \( tb: /l/ \neq /r/ \)). Alternatively, there is no interplay, when teacher is aware of the phonological event (/l/ \( \neq /r/ \)) and not aware that student is not aware of the phonological performance (b. \( tb: /l/ \neq /r/ \) + \( tb_s: /l/ \neq /r/ \)). From those terrains of affordance (a and b above), no seed will strike in the social brain.

As the coursework goes by, if a seed stroke teacher's awareness with a specific sense of goal setting—in this case, a sudden interest for the achievement of the phonological discrimination (/l/ \( \neq /r/ \)) which is provoked from the terrain of the relational affordance (c), the larger the attention, the more massive update of the Awareness as the teacher brain is aware of student's brain grows (d).

c. \( sb_s: /l/ \neq /r/ \) or \( tb_s: /l/ \neq /r/ \) → a seed \( \rightarrow \) \( tb: /l/ \neq /r/ \) \( \notin \) \( sb: /l/ \neq /r/ \)
d. Awareness (P1): well, it works a bit better than before. yes, they started being more aware of the discrimination.

Later on, Awareness develops into an expectant IS pattern (e) in the enhanced feedback loop (e and f) so that the Awareness may be updated again (g).

e. \( tb_t: /l/ \neq /r/ \) → IS: “/l/ is not equal to /r/ okay? Please listen carefully, /l/, and /r/.”
f. \( sb_t: /l/ \neq /r/ \) → \( sb_s: /l/ \neq /r/ \) → LS: “/l/ ≠ /r/” (feedback loop enhanced)
g. Awareness (P2): not exactly, ...but yes, it's almost okay...

The feedback loop will turn until it is complete, where the teacher can become aware of updated phonological awareness (h and i) and the synchronized performances by the student (j).
h. $sb_s: /l/ ≠ /r/ \rightarrow tb_s: /l/ ≠ /r/

i. $sb_t: /l/ ≠ /r/ \rightarrow tb_s: /l/ ≠ /r/ \rightarrow sb_t: /l/ ≠ /r/ \quad \text{(feedback loop complete)}

j. Awareness ($P_1$): yes, good. I am sure they are aware!

At the same time, the teacher is self-aware of being efficacious ($TSE$) (k and l).

k. $tb_t: /l/ ≠ /r/ \rightarrow tb_s: /l/ ≠ /r/$

l. Awareness ($P_1$): I made it. I can affect their learning, ....

The bottom line of the simulation (from a to l) is that $TSE$, in the sustainable mutual updates of Awareness, is also affecting student self-efficacy ($SSE$), as the student must also be aware of the phonological highlight within their brain. Student's awareness perhaps goes vicariously (Bandura, 1997) as follows: “/$l/ ≠ /r/$, yes! now I can do as the teacher can do so, ...” The initial seed of awareness between agents (c in the above simulation) would be affecting teacher's brain, boosting feedback loop, as it is expanding the co-constructive exposure toward the development of the speech ($IS \leftrightarrow LS$), growing into more attentive interplay by updating the social brain ($TSE \leftrightarrow SSE$).

When social brain functions well in a local context, such events may affect teacher’s awareness, provoking improved behavior and self-efficacious sense, which, I assume, might have a significant potential power to invite students into a growing process of L2 (English) feedback loop. This kind of unique events may occur as follows:

1. A discovery (or attention to the unknown) in a particular relational space and time,
2. attention schema, creating new awareness, emerging from the brain’s explicit reduction of the old information (e.g., implicit performance caused by the phonological awareness, such as /l/ = /r/) in conjunction with a bundling process (/l/ ≠ /r/) to update the social brain,
3. subsequent explicit sense-creations (of some intrinsic and extrinsic self-efficacious awareness), some of which lead to self-, and other-, awareness,
4. recursive self-awareness eventually yielding a new type of “action potential” and environmental exposure to the agency (e.g., improvement of IS/LS in English), and
5. growth forming by the boost of (L2) feedback loop.

Increased number of research in neuroscience has revealed what is happening in between these two remote brains during instruction. For example, according to Graziano (2013), with brain scan technology (e.g., functional magnetic resonance imaging [fMRI]), a specific network of brain areas
in the right temporal cortices are active during social thinking—these regions are, for example, the superior temporal sulcus (STS) and the temporoparietal junction (TPJ). Many neuroscientists assume that the regions are responsible for the social brain's recursive process between bottom-up and top-down turns, both of which lead to a successful outcome of the behavior at a task. Van Lier (2004) calls the turn “a continuous cycle of mutual reinforcement” as agents interact with the physical and social world via affordances (p. 92). Below is a summarised suggestion of what the relational model can tell us:

1. Explicit experiencing with goal setting is primarily for the updated awareness by the agency.
2. Implicit experiencing without goal setting should be avoided or at least reduced for less conflict (e.g., a replacement of unprincipled L1 with meaningful L2, as well as the reduction of L1 use, would be most useful in a local context).
3. Sense of efficacy refers to awareness bundled off-hand implicitly by the social brain after experiencing a particular task of importance, and it can also be aware by the social brain.
4. The key to control efficacious sense lies in expanding self-awareness, which means that agents should be attentive to each other during the task to develop social efficacy.
5. The above process is always turning in two ways implicitly and explicitly, therefore, in the local context, the more the language teacher becomes aware of the process, the more chance for the teacher to develop and grow professionally. They must be obtained by:
   (a) the top-down function of the social brain that matches with the previous and current successful experiences and efficaciously adequate information for the goal setting, and
   (b) bottom-up function of the social brain that can be updated from the signalling information in student speech (LS) (verbal and non-verbal signs).

5. Conclusion and Implication

The relational model gives us a conclusive picture for the nitty-gritty of the matter in language teaching in Japan, with a feedback loop raised by the interaction rooted in a classroom context. It allows teacher and student an expansion of awareness to tackle the difficulty in English teaching/learning. In the feedback loop, a teacher initially picks up a seed from the terrain. Then, as the relational brain-interplay, a social brain, occurs, the seed grows into a full loop. The teacher can connect it to an experiential growth, which does, of course, lead to the growth of student(s) with itself developing into the more substantial update for local awareness, more abundant linguistic exposure, and more convenient and pleasurable habitant (classroom) for language education.

Here are some limitations and implications. First, one needs to consider the plausibility when we incorporate subjective sense (efficacy) with affordance. The essence of the latter can be reduced
to the non-mentality since it is a relational entity halfway dependent on the physical by definition. Thus, the problem is how research methodology can undertake the validity of combining two different things: subjective report (self-efficacy), and the connection of it with affordance. The problem is sometimes bypassed by a self-serving language, such as meta-sense, a sense of sense, or teacher awareness of student self-efficacy. Because self-efficacy is always subjectively reported, including a judgment of the immediate engagement, and because top-down quality from the brain circuit meets linguistic percipience (e.g., audibility, visibility) from the material terrain, we should further consider the following question; How can one be for sure about the interplay between the mental (i.e., attention, awareness, motivation, and all the other feelings/cognitions produced by the brain) and the physical (i.e., everything outside of the brain)? Graziano's (2013) interpretation is convincing in the point that all the awareness is information, and because it is information, the social brain can process it through the channel of Awareness.

Another problem rests in selective attention, which scientists regard as the brain mechanism to form a fundamental representation of the awareness of speech (e.g., phonological awareness). The mechanism remains a mystery, however, because we are not exactly for sure why the brain selects this information and not that one. Research has agreed that the brain has an underlying propensity by itself to reduce information for the next selective attention (e.g., working memory), for the future representation and association, the further social behavior, and task accomplishment, as well as the goal-setting in academic environment (Bandura, 1997; Graziano, 2013; van Lier, 2004). In short, our brain seems so parsimonious that we might need to a degree a room for the brain itself to work sufficiently, effectively, and perhaps upmost explicitly, for meaning creation (creativity) and significant and sustainable human behavior in a context.

However, how we can do it? How we can make our brain to work efficiently to give it a room, as this thing may wish to do so. Since we cannot be explicitly aware of a majority of the brain's work in advance, we are bound to aware of the outcome as a description (Graziano, 2013, 2019). Such questions are hard, yet to be solved completely. They are nonetheless necessary for us to answer in future research as we pursue teacher development. One approach is to consider investigating teacher subjective efficacy using neuroscience. TSE plays a central role in the classroom environment. Teacher and learner construct the classroom; however, it is a teacher who finds a seed to set the feedback loop for a goal. TSE—a sense of working well at a particular task, triggered by student feedback, may create the next meaningful step. Since the theory of affordance applies to education, it is right to say that classroom students can afford a teacher action, whilst the teacher can afford students action. Then both social-brain processes would be able to make a “neuro-educational,” as well as a socio-ecological feedback loop between the teacher behavior and student behavior.
References


Abstract

Language instruction is an enterprise for a speech construction and habituation of the linguistic performance in a local context. Teacher and learner (the agents) construct education altogether via environmental events which allow teacher for functioning as a buffer and an enhancer of the immediate classroom phenomena. The aim of the study is: (1) to introduce instructional speech (IS) and teacher self-efficacy (TSE) to forge a significant link between behavior and cognition from language teacher’s point of view, and (2) to draw a path of awareness enhancement—from conflicting to efficacious, from implicit to explicit—by incorporating affordance theory (van Lier, 2004) into the model of triadic reciprocality (Bandura, 1997) and the attention schema theory (Graziano, 2013, 2019). The study first identified connections between IS and TSE. On a link between affordance and social cognition, the study discussed the brain’s physical and mental mechanisms—attention and awareness, where the ecological, neuronal, cognitive, and social function of the brain eventually affects the agentic behavior with a co-constructive feedback loop in the language classroom. The implication was that TSE works well and enhances the IS optimization towards the sustainable and growing enterprise in language education. The attention schema theory shed light to the development of language teacher in Japan because it indicates how one can alleviate a conflict through reducing awareness to Japanese (L1), becoming instead more aware of the significant processing and engagement in English (L2).