

Four Social Neuroscience On-Going Requisites for Effective Collaborative Learning And the Altruistic Turn

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Abstract

Understandings from the field of social neuroscience can help educators cultivate collaborative students who get excited about learning from one another. To facilitate a collaborative atmosphere, educators first need to be able to show concern for their students beyond the subject matter. They also can help students understand how being social works in their favor and teach students skills that they can immediately use to have more effective collaborations. At the same time, for efficient second language acquisition, teachers need to provide students with multiple extended discourse opportunities (MEDOs), or lengthy conversational opportunities. This article proposes that by helping peers and others in their social networks, students actually help themselves become better learners and achieve a healthier mental outlook. Several examples are given to ground each aspect of these ideas from neuroscience into pedagogy (Murphey, 2013d).

Key words: social neuroscience, collaborative learning, altruism, social side of learning, mutual concern

Introduction

The Social Neuroscience of Education (Cozolino, 2013) catalogued findings in recent neuroscience that established the importance of the social side of learning and belonging (Baumeister & Leary, 1995). Similar books by Lieberman (2013) and Hanson (2013) confirmed and reinforced the idea that human brains have the ability to be social and, thus, learn more. In this article, I wish to propose four practical on-going requisites that will help teachers help students become better social learners through becoming more attuned to each other and to everyone's socio-neurological needs. These four requisites are:

1. *Mutual Concern*: Communicating a concern first from the teachers for students' health and well-being that spreads among students and which disarms the fight, flight, or freeze responses in our reptilian brains.
2. *Buy In to the Social*: Convincing students that our brains are naturally social and work better with collaborative/cooperative learning through peer interaction which works in their favor and is indeed an enjoyable way to learn.
3. *Learning Social Skills*: Acquiring a basic skill set about how our brains learn better when we communicate with effective emotional strategies which show our attention to others; these skills might include shadowing, rejoinders, and near peer role modeling (Murphey & Arao, 2001; Singh, 2010).
4. *Multiple Extensive Discourse Opportunities* (Murphey, 2003) are the contexts in which the first three skills become operationalized. MEDOs develop the communicative language skills and strategies, help students buy in to the social way of learning, and allow opportunities to express concern for each other. MEDOs provide the brain with the repeated attention needed to learn and acquire language.

All of these on-going requisites are within the scope of every teacher's context of teaching and require no special neuroscience understanding. However, they all potentially impact the students' brains (i.e., their understandings and reactions) in ways that allow students to become more social and take advantage of collaborative/cooperative learning and the accruing benefits of collaboration (Surowiecki, 2004). The requisites also overlap with each other (e.g., MEDOs can kick-start the other three and vice versa). I will end the article with a short proposal to also strengthen the class with the meaningful altruistic turn which I believe follows the social turn in SLA (Block, 2003) and neuroscience (Cozolino, 2013) in that our sociality flows naturally into altruism, which is also supported by positive psychology (White & Murray, 2015). In the sections below, I illustrate several ways that I have attempted these teacher and student tasks that others might easily do.

Mutual Concern

Many humans have a well-trained negativity bias that in the past kept us alert to dangers that could kill us. Thus, the initial survival of the species depended on being sensitive to dangers in all circumstances. In our present world, this negativity bias is less useful than a positivity bias would be. As Hanson (2013, p. 28) explained, "The negativity bias is not our fault. We didn't create it. Still we can do something about it." Ancient humans in the bush needed to be aware of the potential "lions in bushes" in order to survive, to flee or fight. We still have a primitive reptilian part of our brains that overreacts to everyday things as if they were lions. However, because of the more developed parts of our brains and our neuroplasticity, we can reshape our immediate reactions into more thoughtful responses that can help us lead better lives with less stress. Hanson (2013) called the automatic reactive brain the "red brain," which depletes our energy and resources and can create a negative atmosphere. He called the more mature responsive brain the "green brain" which allows us to enjoy the good things in life more deeply with less fear.

In the typical classroom, many students come in thinking the teacher is a big lion to be afraid of and that the other unknown students are perhaps also dangerous. Thus, in every first class in the last few years, I have told my students that I am first of all concerned with their health because without good health it is hard to learn. Then, I tell them I am also concerned about their happiness, or well-being, for without that they also have a hard time learning. Next, I tell them:

I really don't expect you to learn mostly from me, but mostly in interaction with your classmates. Thus, you need to communicate with your new partners every day. If you did not get enough sleep, tell your partner so they will know that you may be more quiet than usual because you are very tired. Or if you just had an argument before class with a friend, let partners know so they don't think you are angry at them.

I believe that telling students this helps quiet the reactive brain and open up the responsive brain. It also gives them permission to use and develop their emotional and social intelligences (Goleman, 1995, 2006) and to communicate more openly with their peers (Dornyei & Murphey, 2003). These open and direct communications about health and happiness open possibilities of engagement with their peers and promote a sense of safety and belonging to the class as a whole, which Cozolino (2013) refers to as “tribes.”

Convincing Students of the Importance of Collaborating through Peer Interaction

The field of Second Language Acquisition (SLA) has proposed that interaction is indeed one, if not the main driver of acquisition (Day, 1986; Falout, 2014 Krashen, 1981; Long, 1983; Long & Porter, 1985; Murphey, 1990; Swain, 2000), with Schumann's (Lee, et al. 2010) neuroscience group of researchers calling it the interactional instinct and Murphey (2011) referring to it as the interactional imperative for foreign language learning. Research on creativity has also noted that group creativity is actually a better way of understanding how innovation occurs through intensive and extensive interaction (Paulus & Nijstad, 2003).

Dunbar (1998) claimed that the main reason we developed big new brain parts, the neocortex, was so that we could live in larger groups and be more actively social. This sociality led us to actually develop more intelligence. It seems the Neanderthals (who died out) might have been more intelligent in the beginning, but it was our ability to be social and simulate others' experiences mentally that made us smarter and allowed us to survive longer in larger groups (Bower, 2013; Lieberman, 2013). Thus, it was “better to be social than smart” in the long term. In other words, at first, our brains got excited about social interaction, and that allowed us to imitate others and develop special neural abilities to simulate what others were doing and might be thinking. Bergen (2012) explained that “shortly after the sound waves of spoken words hit our ears or the light of written characters hits our eyes, we engage our vision and motor systems to recreate the non-present visions and actions that are described” (p. 223). In other words, our minds are simulators of the experiences we receive from hearing and reading and seeing, and this embodied cognition helps us to be more social and to understand others with empathy.

“Collaborative” also implies that students can have “some say” (i.e., investment) in how the class is conducted. When they have some say, they then usually want to participate more and feel more belonging and identification with the group, two elements that Cozolino (2013) emphasizes in his book. Students’ collaboration with the teachers is a mirror for their collaboration with each other, and it is extremely important in allowing a healthy group agency (Murphey & Carpenter, 2008) in a class community.

Some simple tools are initial surveys of students’ interests and perceived needs, allowing them to report about their past learning and what they liked and did not like. Many teachers now request students to write their language learning histories at the beginning of courses so teachers and classmates can read them and adjust better to individual students. Note that these histories are immensely more valuable when the data set is given back to the students for their consideration and further comment (Murphey & Falout, 2010; Falout, Murphey, Fukuda, & Fukada, 2015). For on-going “say” about class activities, action logs (Murphey, 1993; Murphey, Barcelos & Moraes, 2014), in which students list all the activities and evaluate them, allow teachers and classmates to see what individuals like and do not like. Also, when teachers create class newsletters from the action logs and distributes them in the class for all to read and discuss, students can see that their own comments are being used and considered, and thus can feel more a part of the class.

Communication Basics and Strategies

Cozolino (2013) and other neuroscientists tell us that our main simulation system is our mirror neurons, which at first we mistook for simply motor neurons. Mirror neurons attempt to enact neurologically what we see and hear and even imagine. They become even more active the more of the neurological system we engage. So while listening engages part of the brain’s mirror neurons, silently repeating (i.e., shadowing) the speech of another engages the actual micro muscles that may be used in vocalizing and, thus, proves to be a more holistic exercise. If we actually vocalize (i.e., repeat out loud), we have feedback which we can use to compare and make adjustments (Murphey, 2000; 2001). In shadowing and mirroring others, we engage not only the language for communication, but also the whole range of non-verbal possibilities, bringing embodied cognition to the forefront of learning (Hanson, 2013).

To demonstrate these activities and their power, I ask students to look at their partner and with no words, only gestures, to explain to them three things they like. I always demonstrate one or two things myself up front and they guess what they are, so they get the idea. This non-verbal communication “levels the playing field” a bit for the less verbal and the talkative and emphasizes embodied cognition.

I also ask a strong student who is not too sensitive to come up and have a conversation with me. Typically I say, “Tell me three things you did this morning.” Then, I quickly look away and give him no eye contact while he is talking. For instance, I take out a cell phone and glance at it. When he is finished, I look him in the eye and say, “I am sorry. I was demonstrating how to be a bad partner.” Next, I ask the class what I did that was bad. They usually say, “You looked away. No eye contact. No interest. Your body was rude!” Then, I ask if I can try one more time and see if I improve. This time, I ask my student

partner, "Please tell me three things you will do tonight." I face him and mirror him and his gestures, I repeat some words (shadowing), give rejoinders ("wow cool!"), look interested, and ask follow up questions (e.g., "What movie will you go see?). I usually follow this up with several short conversations in pairs in which students see how to use complete and partial shadowing, as well as interactive shadowing (Murphey, 2001).

Later, we exercise with rejoinders, follow up questions, and improvisation (Morris, 2012), all part of a skill set that will allow them to greatly increase their learning. Note that normal conversations almost never stay on topic and shift back and forth between topics naturally, so we improvise. Getting students comfortable with improvising can start with simple games where they take turns saying one word each from the beginning of a phrase I give them (e.g., "School is...") and they have to add to it and make a long phrase, each using and following on with what their partner gave them. This follows the two main rules of improvisation: (1) say "yes" to what your partner gives you, and (2) say "and" by adding something to it. This is great training for life as well (Leonard & Yorton, 2015). There are many other communication beliefs, skills and strategies through which teachers can help students become more sensitive and helpful partners (Cohen, 1998; Dörnyei, 2005; Murphey 1996b; Oxford, 1990).

Multiple Extensive Discourse Opportunities (MEDOs) and Adjusting to ZPDs and ZPAs

Probably the number one problem in English as a Foreign Language (EFL) environments (and some English as a Second Language environments as well) is the lack of multiple extensive discourse opportunities ([MEDOs], Murphey, 2003) in which students can get into a flow at their level and enjoy an extended conversation. MEDOs also allow for what brain science refers to as "regularly reestablishing attention" (Cozolino, 2013 p. 232-234), also known as spaced repetition of learning material that allows the brain to bring attention back to learning material that may only be tentatively networked and in danger of being lost if not attended to an ample number of times. Most people express this with the adage, "The more you do it, the more you got it!"

This lack of MEDOs also accounts for a typically slow acquisition process. If students can be convinced to go passionately crazy for their second language (L2), get "language hungry" (Murphey, 2006), and use self-talk as well as playing with the language more often in and out of the classroom (Murphey, 2014), they improve quickly. Teachers can contribute by giving students extended opportunities to talk in class, which often gets them excited about speaking more when they have successful experiences in scaffolded activities. Then, they want more opportunities to do it out of class.

Just giving free time to talk is rather irresponsible, and when not successful, it is a negative experience. Talking with a task to accomplish creates more focused learning, and when these tasks have follow up presentations to others, students take them more seriously. It is also good to ask students for a list of possible topics that they think they would enjoy talking about. Truth be told, in language classes with over 20 students, most teachers do not always know if students are on task. I tell this to students but let them know I do see if they have stopped talking, which does not look good because they are not taking advantage of the speaking opportunity given them with a person they

usually do not know. I tell them a story about me telling my father that I was bored with school when I was 10 years old, which often gets them to take more advantage of all the opportunities they have (see Appendix A for the story).

Finally, there is the question of different levels and students adapting and adjusting to each other so that everyone learns, or uses their zones of proximal adjusting ([ZPA], Murphey, 1990, 1996a, 2013a). Vygotsky (1978, 1987) proposed that teachers should open up students' zones of proximal development (ZPD), that area where they are ready to learn but just need a bit of help from one another. That bit of help from another, however, means someone knows how to adjust to the learners, and we all have different abilities to adjust and help. Zones of proximal adjusting (Murphey, 2013a) have to overlap with ZPDs for them to be effective. Thus, convincing students that they have something to learn from everyone gets them to adjust and learn to adjust to lower or higher level partners so that everyone learns (see Appendix B). Students will not all learn the same things, but they can all learn to teach to learn.

The Altruistic Turn: Sensitizing Videos, Testing, and Teaching to Learn

Neuroscience has shown us that we are extremely social beings. Tomasello (2009) asserted that even one-year-old infants are naturally altruistic, although culture has twisted ways of mediating these natural propensities. Nevertheless, I believe that students can become more tuned into altruism and its benefits through several classroom experiences and procedures. Teachers need to foster altruism as a positive turn. Altruistic orientations entail activities and conditions that promote sharing, helping, and informing, not just with those in students' own in-groups, but with all others. Tomasello (2009) noted, "Teaching is a form of altruism, founded on a motive to help, in which individuals donate information to others for their use" (p. xiv). One of my goals as a teacher is to find information that is not only interesting to my students, but potentially helpful to those in their social networks, so that they can take the material and teach it to others, thus also benefiting from the well-becoming teaching rush that I regularly feel in my classes. The videos described below can point our students' minds toward these possibilities, going from personal applications to group and then to global, and encouraging critical collaborative autonomy (Murphey & Jacobs, 2000).

Teachers can use short videos that sensitize students to the lives of others and create empathy. For example, the video Paradigm Shift ([youtube.com/watch?v=JlRK1vqcuvg](https://www.youtube.com/watch?v=JlRK1vqcuvg)) at first shows an angry young man going through his day. We hear his self-talk about how everybody seems to be against him (e.g., taking his parking place and cutting in front of him in line). Then, for the latter half of the four-minute video, he receives some special glasses that allow him to see a subtitle under each person's face, such as "just lost his job", "fighting addiction," or "grieving best friend's death." Realizing that others have problems and emotional trajectories that are not caused by him, he becomes more proactive in wanting to help others, rather than selfishly thinking the world is against him. Students are somewhat shocked, as most viewers are, as they transition from first identifying with the young man's selfishness and then realizing how others may be struggling much more than we are. Many students ask for the video's title to view it again with others out of class and seem to break out of an unhealthy "self-focus," moving toward a more altruistic mode of processing.

A group oriented video that works well in the Japanese environment shows university students talking about their junior high school and high school English education and asking the government to change things (The Real Voice of Japanese Students, 3 minutes, [youtube.com/watch?v=MwsZ0KiHhRg](https://www.youtube.com/watch?v=MwsZ0KiHhRg)). The video not only says what a lot of the students are thinking themselves, at the same time, but also gives them a sense of agency that they can at least speak up and let others know about the problems in education and their lives, thus producing a potential sense of group agency (Murphey, 2013b; Murphey & Inoue, 2014). While the Paradigm Shift video helps students to shift on the individual level of empathizing with others, the Real Voice video sends the message that they can possibly change the world as a group. A third video, The Girl Effect (two minutes), produced by Care International ([youtube.com/watch?v=WlvmE4_KMNw](https://www.youtube.com/watch?v=WlvmE4_KMNw)), is at the global level of processing and sends the message that we can change the world internationally with the small gesture of buying a “third world” girl a uniform so she can go to school, and she can do the rest. This video has only words flashing up on the screen extremely fast, and it becomes a challenge to read it all quickly which students come to enjoy doing collaboratively.

The collaborative point of these three videos is that we can shift students away from a sometimes overbearing self-focus towards empathizing with others personally (Paradigm Shift), recognizing our group agency (Student Voice), and finally, seeing that we can even have a global impact in small ways (Girl Effect). I believe that these videos when discussed in class open the possibilities for many students to become more altruistic, form more sensitive relationships, develop feelings of agency in their world, and create hopeful global futures. Personal stories told by the teacher or by students can also greatly help to sensitize students to each other and get them to bond more strongly to enhance future collaborations (e.g., see: [youtube.com/watch?v=OL7DxMKucik&index=7&list=PL274902FC5BDAAA30](https://www.youtube.com/watch?v=OL7DxMKucik&index=7&list=PL274902FC5BDAAA30)).

Teachers can even turn testing into a social activity by allowing students to help each other in the last few minutes of a test (Murphey, 2013c, 2013d, in press). Initially, students naturally think this is strange, but often upon further reflection find it something they will be doing for the rest of their lives, as one student stated (see Appendix C for the compete protocol), “I really like this type of test. I’ve never done such a creative and interactive test, and I really think that I was required to get information and help people, and these are vital skills to live in real life!”

Finally, and most recently, I have been experimenting with asking students to teach what they are learning in class to people they know out of the class and to write up case studies of their teaching (Murphey, 2014; Murphey, 2016). They have to decide the person, place, and time; they do follow up teaching and quizzing; and they write up a case study reporting and reflecting on what they did. They obviously have to cooperate with their “students” and to improvise and soft assemble, while teaching something that they are perhaps still learning themselves. (See booklets at: sites.google.com/site/folkmusictherapy/home). This push toward agency seems to be extremely helpful for their own learning and seems to have opened up many to the joy of altruism.

Conclusion

Cozolino (2013) noted that, "Teachers are neuroscientists who conduct experiments in the neuroplasticity of learning. But they are not detached observers; their personalities, enthusiasm, and spirit are all vital components of the neurobiological process" (p. 169). Altruism seems to be growing in pedagogy (Falout et al., 2015) and country branding (Anholt, 2015), as we all want to see how we might help others learn and progress better in the world with a level playing field. We humans will retain our primitive brains and continue to be helpful in certain dangerous times, but the foreseeable development for humans is to gain control over our ancient ways of reacting with fight or flight and to better regulate our behaviors for helping and happiness. There is no reason for teachers to wait and not begin now to spread such understandings among students and colleagues, indeed, even among politicians, to help our neuroplasticity create more capable and altruistic brains and educational systems.

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Appendix A: Fantastic Boredom (Excerpted from Murphey, 2006)

When I was a ten-year-old, I once confessed to my Dad, "School is boring."

He said, "What?" – acting as though he hadn't heard me. So, I repeated, "School is boring!" His eyebrows rose with a concerned and slow "I see." With his hand on his chin, he stared into space for a moment, and then as if struck by a meteor from inner space, he suddenly shot back, "How many kids in your class?"

"About 30."

"And how old are they?"

"They're ten, like me."

"Thirty kids, all ten years old – wow!" and he stared into space as if some miracle had happened.

"What?" I begged. I couldn't imagine what was so magical about 30 ten-years-olds.

"Well," he said, pausing just long enough to make sure I was interested, "30 kids, each ten years old, that makes 300 years total. Three hundred years worth of living! In the same room, at the same time! Each person so different, with thoughts and beliefs and ideas! I mean just trying to imagine what each one had for breakfast is amazing! Or what each one is thinking at any moment! Imagine if thoughts could be heard, wow, you could hear thirty thoughts at the same time! I wonder what secrets they all have? I wonder what they dream at night?"

At the ripe old age of ten I'd had ten years' experience living with my Dad. So, I already knew he was a little different from other dads. My response was to roll my eyes and walk away. But the next day in school, I couldn't keep from wondering what all my classmates had for breakfast, what they had dreamed about the night before, what made them the way they were, and what they were thinking about when the teacher was talking. School didn't change, but my perspective and behavior did. Suddenly, going to school was more like going to the zoo. Everything became fascinating!

Appendix B: The Wise Person and the Fool

If a wise person has a conversation with a fool, who learns the most? When someone first asked me this question, I immediately thought the wise person knows so much and the fool so little that naturally the fool will learn more. But then I slept on it and woke up with a different answer: The fool is a fool probably, because they do not know how to learn well, and the wise person is wise because they do know how to learn. So, if the wise person is truly wise, they should be able to learn from the fool.

I was a summer-camp tennis teacher when I first encountered this riddle. And I asked myself, what am I learning from all the students coming to learn how to play tennis from me? I want to be wise person. And I noticed that I needed to learn about the students,

and build a relationship with them so they could learn more from me. I needed to learn their names and personalities so that I could adjust and teach them well. Then, I realized they were teaching me how to teach and adjust to different levels.

In our classes, during pair and small group interaction in classrooms, no one is a fool, but we have many levels of wisdom, and some people's language abilities may be lower than yours. So, true, you may not learn a lot of new vocabulary from some partners, but you will learn interesting information if you get them to talk and make them comfortable and adjust to their level. You can actually learn from them about how to teach better by helping them learn more.

The wise are always learning in any situation. Be wise: learn to help your classmates learn, and you will learn more.

Appendix C: Social Testing Procedures (Murphey, 2013d, 2014)

My procedures start with a conventional test that slowly turns into a social collaboration, a contrast that is sharply noticed and commented upon in student feedback further below. The following steps have developed over the last three years of experimenting with this procedure (with a total of six semesters of university EFL classes, involving students from all four years with 20 to 80 students in a class).

Students take a regular style test (usually a fill in the blank or short answer, entailing recalling and reflecting on information), and after an appropriate amount of time (e.g., 20-30 minutes), they stop. Next, I ask them to put away their pencils and erasers, and to take out a pen (blue for best contrast) and give themselves an estimated score at the bottom of the test, say 50 % or 70% or 86%. I tell them I will take any erasers and pencils I see out on their desks: they are only to have a pen from that point on.

Next, I tell them they have 5 minutes (I usually lengthen it to 10 to 20 minutes, depending on how active they are and how big the group is) to ask any of the questions to anyone in the room and to add to their answers or write down new answers on their tests. In order to make it as orally interactive as possible, I set a few more rules: a) *"You are not allowed to look at anyone's paper or show your own paper to anyone."* If I see this happening, I tell them they fail and I collect their papers. (Sometimes I need to explain that "copying" is not learning, whereas a dialogue can open ourselves up to an exchange of ideas and nuances.)

If I want them to interact with more people, I tell them: b) *"You can only ask one or two questions per person."* If they want to erase an old answer: c) they simply . When the time collaboration is over: d) they will give themselves a second % score for the new state of the test, and hopefully they believe they have improved their tests a lot. [The change to ink allows the teacher to see approximately how much was answered with the help of others and how much was answered alone. They usually become intensively interactive during this time. I circulate and remind them loudly not to look or show their tests to anyone and to simply ask and dictate to each other. Many report actually constructing answers together during this time.]

After finishing this second round of score estimation, I ask them to put in the second score and to write *the names of the people who helped them, the names of those they helped*, and to comment on *what they think of the test*. The bottom of my tests now look something like Table 1 below:

Table 1. Bottom part of the tests that students fill in

...		
1st score	/100% 2 nd score /	100% 3 rd score
Who helped you?		
Who did you help?		
What do you think of this test?		

The third score, in Table 1 above, is for the teacher after the test and could be used in a variety of ways. For a final score, the first two scores can be averaged or calculated with different weights. Invariably, with my overly humble Japanese students, I am raising the scores, but that may not always be the case. Each time I do a test like this, the students are in awe the first time, and after having done it and seen how much they learn from it and benefit from it, they love it.

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