

Language and self-awareness

A new study presents additional evidence for inner speech involvement in self-reflective activity

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In my 2003 SCR paper “Inner speech and conscious experience” ([LINK](#)) I put forward the notion that we most often need to talk to ourselves in order to understand who we are. That is, inner speech is frequently required to access self-information and to gradually build a self-concept. To illustrate, let’s imagine that you want to reflect on an abdominal pain you are currently experiencing. It is very likely that you will engage in an internal monologue, thinking “Why is it that my belly hurts? I feel cramps... Ha! I get it—I skipped breakfast...” You could go on and also notice: “I’ve been missing breakfast often lately... I tend to sleep in, I don’t eat breakfast, and by noon I’m starving... And I didn’t go to the gym as often as I should have... This is bad—I’m getting lazy...” Here the adjective “lazy” constitutes the conclusion that you have drawn from your inner monologue; it may then become a more or less permanent part of your self-concept.

So inner speech, and thus language, would play an important role in self-referential activities. Said differently: inner speech would represent an important cognitive process underlying self-awareness. Note that this view does not implicate that there is no self-awareness without language. We can be aware of a pain without having to talk to ourselves about it. However, I argue that the sensation will be fully brought to consciousness only if we verbally label it.

This is an intuitively appealing hypothesis that is largely accepted in the literature. But do we have empirical evidence to substantiate it? Not much. We know that frequency of self-focus and use of inner speech are correlated. We also know that disruption of inner speech following brain injury impedes self-awareness. But clearly, more work is needed.



Image 1—a fMRI scanning machine

Brain-imaging studies (see Image 1) indicate that the left inferior frontal gyrus (LIFG—Broca’s area in the left hemisphere) sustains inner speech use (see Image 2). This brain structure lights up when people are asked to talk to themselves in silence. On that basis I reasoned that brain-imaging studies of self-awareness could be reviewed to determine the extent to which LIFG activation is reported. I hypothesized that if such an activation was indeed frequently observed, I could infer that inner speech was most probably used by participants while working on self-relevant tasks. In a typical experiment, participants are invited to focus on some aspect of their inner experience while brain activity is being recorded.



Image 2—the LIFG

Myself and Jay Michaud, a student at Mount Royal College in Calgary, reviewed 61 studies measuring brain activity during processing of self-information in seven different self-domains. These were: (1) agency (knowing that you are the cause of your own actions), (2) self-face recognition (identifying a face seen on a screen as being yours), (3) emotions (assessing how you currently feel), (4) personality traits (determining if a trait adjective describes you), (5) autobiographical memory (remembering a personal past episode), (6) preference judgments (indicating which of two drinks you prefer), and the resting state (staying still and doing nothing). [You might think that our brain is inactive when we “do nothing”, but it’s actually quite active: in that state we think about our goals, emotions, needs, behavior, physiological sensations, etc. Thus the resting state represents an highly introspective condition.]

Our results have just been submitted for publication ([LINK](#)). 57.4% of all studies reported LIFG (and presumably inner speech) activity during self-awareness tasks in the seven self-dimensions described above. You might think: Well, that’s not that much, it means that 42.6% of the studies did not find LIFG activity. True. But as I stated before, self-awareness may be possible without language. After all, our ability to self-reflect constitutes a complex multidimensional phenomenon not only dependent upon cognitive factors (e.g., inner speech), but also neurological, social, and ecological aspects (see my [2004 paper](#) for details). I propose that an activation of the LIFG in almost 60% of the studies reviewed is nonetheless substantial.

More importantly, our data suggest a selective involvement of inner speech in self-referential processing. This makes sense. It is unlikely that all self-awareness tasks require inner speech use. Take self-recognition as a point in case. It is doubtful that you will need to verbalize your name to yourself in order to recognize your face on a screen. Why? Because in essence, self-recognition represents a perceptual task, where the information to be assessed (your face) is visual and concrete. For that type of self-awareness, words are not needed for the information to be captured. But more conceptual self-dimensions, like emotions and personality traits, do entail that you talk to yourself about them, because the information is much more abstract in nature. So if you were asked to determine if you are punctual, you would most probably say to yourself “Well, I’m always on time for my appointments, so yes”, or “Well, I’m always late for my appointments, so no”. The same principle applies to other conceptual self-domains—e.g., preference judgments and autobiographical memory.

Figure 1 presents the percentage of studies in which LIFG activity for each self-domain was observed. It is obvious that access to more conceptual self-information is linked to increased LIFG activation. 69.6% of all studies employing conceptual self-tasks (i.e., REST, evaluating one’s personality traits, emotions and judgments, and accessing one’s autobiographical memory) reported LIFG activity, whereas only 20% of studies using perceptual self-tasks (i.e., sense of agency and face self-recognition) identified such activation. This difference was statistically significant. Again, what this suggests is that perceptual self-aspects (e.g., your face) can be brought to conscious awareness without words, whereas conceptual self-dimensions (e.g., your current emotional state) most probably necessitate verbalization.

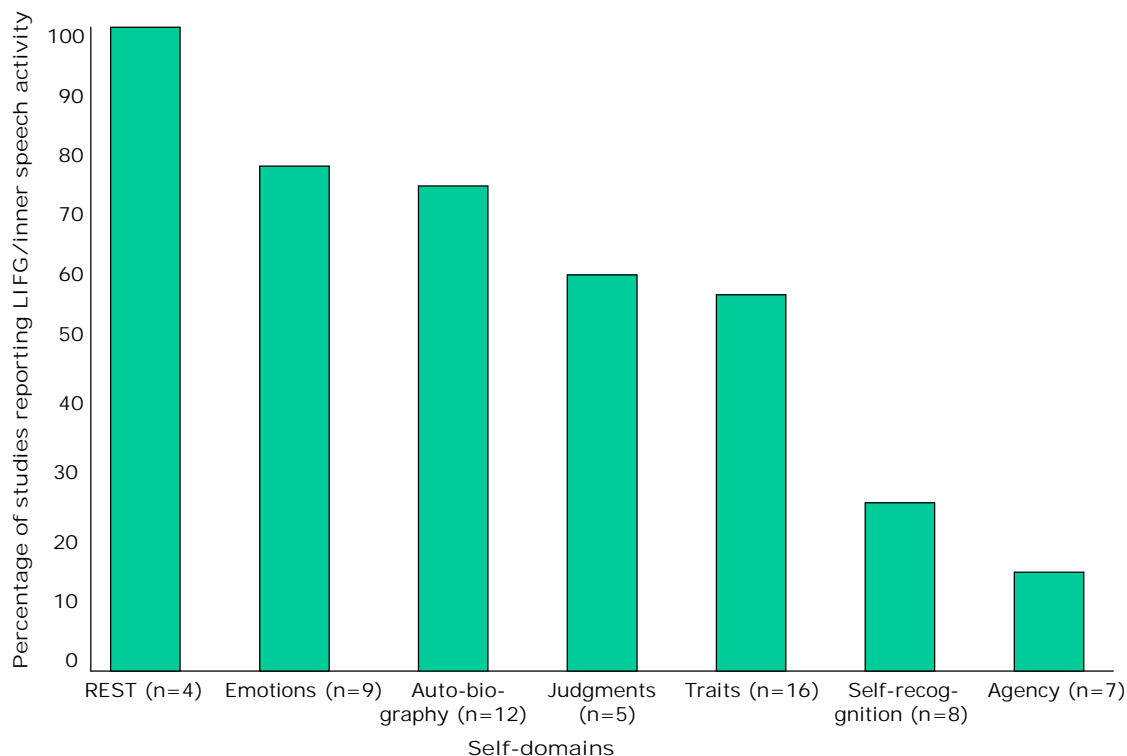


Figure 1—Percentage of studies in which LIFG activity was observed as a function of self-domains

So far, most self-awareness studies have been trying to identify specific brain areas activated during processing of self-information. The medial prefrontal cortex seems to play an important role in that respect (see Image 3). But by looking at peripheral structures that are additionally recruited during self-awareness tasks, we can infer what particular thought processes are engaged as well. In our work we focused on the LIFG and found that it is often—but not always—activated during self-reflection.

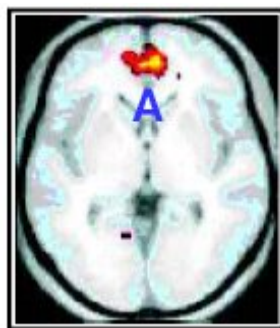


Image 3—the medial prefrontal cortex (in red)

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