

Capítulo 14

Linguistic Modalities: A Socio-Cognitive Embodied Ability Present in Theory of Mind and Moral Cognition

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Resumen

Este estudio está enmarcado en las ciencias cognitivas de tercera generación, donde los procesos mentales coexisten con lo social, corporal y cultural. En específico, exploramos la interacción entre la Cognición Moral (MC), la Teoría de la Mente (ToM) y las modalidades lingüísticas, dominios interdisciplinarios que ayudan a comprender cómo los humanos construyen representaciones mentales por medio de procesos lingüísticos y cognitivos. De hecho, este estudio sigue la Teoría Modular de las Modalidades (Gosselin, 2010), que propone, entre otros aspectos, superar un problema de la validez lógica de las proposiciones. Para lograr tal objetivo, el estudio se basa en un enfoque integral y en un diseño etnometodológico. Para la recolección de datos, se realiza una tarea de dilema moral, entrevistas semiestructuradas y grupos de discusión. Algunos resultados parciales teóricos, analíticos y prácticos indican la importancia de las modalidades lingüísticas, la corporeización, las habilidades sociales y las predicciones de acciones y sentimientos de otros en el momento de pensar y comunicarse (in)moralmente.

Palabras clave: Modalidades lingüísticas, cognición moral, Teoría de la Mente, cognición corporeizada

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Abstract

This study is nested in third generation cognitive sciences, where mental processes co-occur with social, bodily and cultural processes. Particularly, we explore the flow among Moral Cognition (MC), Theory of Mind (ToM) and linguistic modalities, interdisciplinary domains that help to comprehend how humans construct mental representations by means of linguistic and cognitive processes. Indeed, this study follows the Modular Theory of Modalities (Gosselin, 2010), which proposes, among other aspects, to overcome a long-standing problem in philosophy: the logician validity of propositions. For achieving such a goal, the study is anchored to a comprehensive approach and to an ethnomethodological design. For the data collection, a moral dilemma task, semi-structured interviews and discussion groups are carried out. Some theoretical, analytical and practical partial results indicate the importance of linguistic modalities, embodiment, social abilities and others' actions and feelings predictions at the moment of thinking and communicating (in)morally.

Keywords: Linguistic modalities, moral cognition, Theory of Mind, embodied cognition

Introduction

For a very long time, it was believed that one cannot derive a value judgment from a descriptive one (Hume, 2000 [1739]). This conception has appeared to be wrong (Searle, 1964; Rodríguez, 2018; Knobe and Gendler, 2013), and such a discovery may impact the way humans understand life, how we use morality, and the subjective and objective interpretations we can make upon the world. Historically, to have an approximation to mental representations, states, judgements and so on, language studies have contributed significantly in different ways. Indeed, as most cognitive phenomena cannot be directly observed, language serves to indicate, at a certain level, the cognitive structures, functions, and processes required for humans to evaluate what is good, bad, worthwhile, laudable, objective, facultative, among others.

Also, the way to understand such cognitive phenomena varies depending on the epistemological viewpoint. This study is nested in a representational paradigm, since we believe that the mind holds mental representations as well as mental states (Barsalou, 1999; Evans and Green, 2006; Rodríguez, 2018). Such representations are tangible when individuals communicate and interact (Astington and Baird, 2005; Gosselin, 2010). What is more, we adopt the parsimonious view of representations in a neo-modular perspective⁵¹, where language co-occurs with other cognitive phenomena. In concrete, modality is both the linguistic-cognitive process that gives rise to mental representations, and the source for communication and interaction.

Modality has been a subject of interest for centuries. Indeed, it can be traced back to Aristotle in the bivalent logics, with further development in the modal logics. Nonetheless, modality had a shift to the empirical world via the Cognitive Linguistics discipline by the middle 70's and 80s with the work of Fillmore (1975) and Rosch (1975). This discipline studies “the relationship between human language, the mind and socio-physical experience” (Evans, Bergen & Zinken, 2007: 2). The axioms supporting this discipline highlight four principles: 1) “conceptual structure is embodied; 2) semantic structure is conceptual structure; 3) meaning representation is encyclopaedic; and 4) meaning construction is conceptualization” (Evans, Bergen & Zinken, 2007, pp. 6). Therefore, to have an approximation to modality following the empirical criteria here portrayed, scholars are consistent with the idea that it should be embodied, represented encyclopaedically, and conceptualized according to the cognitive architecture humans have.

Furthermore, some cognitive linguists manifest that a huge part of research is directed to the mental processes dealing with language and cognition, leaving aside the sociocultural elements that help (and construct) such mental processes (Croft, 2009; Sinha, 2007). They manifest that language is not exclusively a mental capacity made of

⁵¹ In his theory, Gosselin adopted an intermodular perspective for modalities; we believe our perspective is neo-modular since it incorporates the abstract and the concrete part of embodiment. This point is developed further in the manuscript.

mental structures and processes, but a *societal cognitive system* that must be at the center for human interaction, giving rise to the neural and bodily systems where social and cognitive abilities take place. Consequently, Croft (2009) suggests four socio-cognitive principles intending to complement the traditional ones in Cognitive Linguistics, for it to become Societal Cognitive Linguistics.

1. Grammatical structures and processes in the mind are instances of general social cognitive abilities as well as individual cognitive abilities
2. Grammar consists of a semiotic triangle of the form, the meaning, and the community in which the meaning is conventional
3. Meaning is shared as well as encyclopaedic
4. Meaning involves construal for the purpose of communication. (Croft, 2009, pp. 412)

We adopt this complemented view of language in a holistic system: mind, body, and world. However, modality becomes a larger object of study ontologically speaking. As a result, the narrow view of modality in Cognitive Linguistics, defined as “the attitude of the speaker towards the proposition” (Givon, 1994, pp. 266), is no longer sustainable in socio-cognitive terms. We do not deny the narrow view, but it cannot explain frontiers less explored, viz. embodiment and representations. Such a reasoning leads to the Latin-Greek (wide) tradition, where modality is defined as “the ways of validating and invalidating mental representations” (Gosselin, 2010, pp. 53). Accordingly, modalities are what must be added to the representations for the constitution of judgements that may be ultimately expressed by means of propositions, enunciations, predications, sentences, signs, and so on (Gosselin, 2010).

There are two meaningful differences between the Anglo-Saxon and the Latin-Greek views of modality. On the one hand, while the former contemplates an attitude, that is, a psychological trait, the latter contemplates the validation, a linguistic-cognitive process, which brings in a bigger scope. In detail, an attitude includes both “epistemic

(relating to issues of truth, belief, certainty, evidence) and valutive (dealing with desirability, preference, intent, ability, obligation, and manipulation) attitudes” (Mortelmans, 2007, pp. 870), and a linguistic-cognitive process is one that co-occurs with other cognitive phenomena, say perceptual experience. On the other hand, propositions are a concept that lay on a logical and analytical basis, indicating the validity and falsity of a certain mental concept, whereas the term “representation” deals with perceptual and cognitive processes that end up in an abstraction of reality. That said, the interest is not the validity of the content, but the validation and invalidation of larger mental constructions. By validation, Gosselin (2010) means that representations can be true, false, contingent, possible, impossible, desirable, obligatory, etc.

The author stipulates six categories of modalities⁵² that represent cognitive and social traits in humans, based on linguistic-cognitive parameters, namely, the Instance of Validation, the Force of Validation, the Direction of Adjustment, the Reach in the Logical Structure, the Level in the Syntax, the Degree of Engagement, the Temporality, the Relativity, and the Markedness. Therefore, there are no boundaries among syntax, logics, semantics, and grammar, since the adoption of the Modular Theory of Modalities deals with these nine parameters, giving birth to a transdisciplinary theory. What is more, this theory conceives that any morpho-lexical unit can express modality, not only modal, semi modal and epistemic markers, as it is the trend in the Anglo-Saxon tradition (Ayoum, 2013). Recently, research on modality has shown a successful application of Gosselin’s theory (see particularly Niño; 2019; Loaiza and Ortíz; 2021-in press; Gosselin himself, 2020).

The evolution of modality has been confirmed through the centuries, from Philosophy to Logics to Linguistics and to Cognitive Linguistics. Such an evolution brings new understandings about how humans conceptualize the world and act upon it. It has also contributed to new epistemologies where the social and the classical internal cognition flow in ease. However, no theory has studied modality following the Embodied

⁵² Alethic, Epistemic, Deontic, Volitive, Axiological and Appreciative modalities.

Mind Hypothesis, where cognition, language, and representations are embodied (Lakoff and Johnson, 1999; Sinha, 2007; Rohrer, 2007). If one is to admit that modalities (the Latin-Greek tradition) are the way an individual validates and invalidates mental representations (Gosselin, 2010), the previous theoretical approaches to modality must develop new understandings. Hence, we suggest that modality could be understood as symbolic, conceptual, and embodied, both necessary for mental representations' construction and for communication.

If modality is taken as social, linguistic, cognitive, and embodied, there might be several fields that could benefit from it, say, politics, morality, literature, among others. In fact, the narrow tradition of modality has come to play a pivotal role in the social cognition domain. Mainly two arenas are concerned with modality directly: Theory of Mind (ToM) and Moral Cognition (MC). In general terms, ToM deals with a system of concepts and mental states that humans develop to predict others' actions and intentions (Redolar, 2014); since this is a kind of reasoning dealing with an epistemic stance (subjective experiences and beliefs about somebody's actions and intentions), modality is there present; yet, it seems that epistemic modality in ToM is far too reduced, given the fact that the root meaning⁵³ of epistemic modals (Papafragou, 2001) is left apart. Indeed, it is well known that ToM also incorporates wishes, emotions, beliefs, and intentions as notions that are crucial for the human faculty of thought and communication (Wellman, Cross & Watson, 2001). Arguably, the narrow view of modality in ToM seems to fail to explain it all. That is why the Latin-Greek tradition is needed to comprehend the real role of modality in ToM.

Accordingly, modality occurs in verbal thought and in communication, embracing all ToM phenomena (Astington & Baird, 2005; Gosselin, 2010). Simply put, they help to construct thought in which there are mental representations and judgements that are put into communication and interaction. The relevance of modality in ToM is of considerable

⁵³ Root meaning in modality is a term used by cognitive linguists to refer to the semantic value of the modals: obligation, permission, ability, and volition (Mortelmans (2007); we reject this simplistic view and adopt the holistic one, in which there are clear-cut sets of modalities to distinguish principles and parameters, not just values.

interest among scholars. In fact, by applying the False Belief Task (FBT), implicating the above-mentioned simplistic view of epistemic modality, researchers can determine if a subject falls into the Autistic Spectrum Disorder (ASD). Basically, if a person cannot infer the behavior of someone who possesses a false belief, she has not reached a ToM threshold, showing difficulties of the epistemic mental activity (Balmaceda, 2020). In their meta-analysis, Wellman, Croos & Watson (2001) concluded that the FBT is largely applied in children. Nonetheless, the task has been criticized for showing inconsistencies (Bloom y German, 2000). The case is that researchers fail to explain why some ASD subjects pass the task and some neurotypical ones fail to pass it (Papafragou, 2001). Evidently, the task contemplates other markers⁵⁴ that express other epistemic values, as well as other types of modalities. For instance, the volitive modality: “Sally *wants*⁵⁵ to play with her ball”.

The literature regarding ToM and modality is abundant. On the one hand, scholars have reported meaningful progress of subjects’ language being trained to improve their performance on the FBT (see Brown, Donelan-McCall & Dunn, 1996). It appears that training in spontaneous communication, dialogues, problem solving, narratives and epistemic verbs’ exposure contribute to improving their performance on the FBT (Astington & Baird, 2005). The mental abilities regularly improved are the following: 1) adopting different viewpoints (Harris, 2005); 2) predicting others’ points of view (Hale & Tager-Flusberg, 2003); 3) and having better social and communicative interactions (Lohmann & Tomasello, 2003).

On the other hand, developmental research indicates that mental abilities and modality develop regularly in the same stages (Papafragou, 2001). For an individual’s well-developed ToM, she/he must have gone through the development of deontic

⁵⁴ We know of a varied array of research that incorporates other sorts of tasks, some of which deal with images, not words (Baron-Cohen, 1985). We will argue that the instructions are still language-dependent on the one hand, and that images belong to the semiotic field, where they also create mental representations, where there is a subject validating them (using modality), on the other one.

⁵⁵ Emphasis added.

modality at the age of 4-5, and the epistemic one onwards (5.5 years) (Papafragou, 2006a). Beyond this, rich communicative scenarios also help to improve the performance on the task, namely schools and open areas (Lagattuta & Wellman, 2002), and the integration of familiar subjects and characters in the conversations (Cutting & Dunn, 1999). However, the current call is to go beyond children's performance on the FBT to study ToM and modality in adults in noncontrolled scenarios, this approximation still incipient in ToM (Zambrano, 2020).

Previously, we portrayed the role modality plays in ToM and the need for further research contemplating the Latin-Greek tradition of modality. In the paragraphs that follow, another scenario where modality plays a pivotal role is depicted, namely, Moral Cognition (MC). It deals with predicting and explaining cognitive states, intentions, wishes, intuitions, emotions, shared and individual beliefs (Monasterio, 2020). Simply put, MC's object of study is highly alike to ToM's one; that is why many scholars, from different disciplines, argue that MC and ToM can be treated as a complex unit, not as two independent ones (Knobe, 2005; and Monasterio, 2020). Indeed, experimental research has demonstrated that intentionality and belief are universals in humans and are determinant in ToM and MC (Young & Saxe, 2007).

From neurosciences, it has been suggested that ToM and MC share the neural networks involved in predicting, judging and making decisions (Young *et al.*, 2007). To illustrate the complex unit ToM-MC, research has alleged that when subjects are exposed to lies, jokes and irony, they first predict what is good and bad for them (Leekam, 1991). Conversely, there is also evidence showing that subjects' morally emotional experiences distort their ToM (Nadelhoffer, 2005), that normativity conveys the intentionality that affects the pragmatics in ToM (Adams & Steadman, 2004a), and those moral considerations are necessary for *all* ToM (Knobe, 2004). On this matter, many studies have found the impact of individuals' normative considerations influencing their ToM (therefore their MC) in tasks where the language used is purely descriptive (see the huge list of studies in Knobe & Gendler, 2013).

Furthermore, researchers keep on observing what happened to be called *The Knobe Effect*: to derive prescriptive values from descriptive ones (Knobe & Gendler, 2013). Their findings are of prior interest to this doctoral research project. In fact, scholars argue that passing from descriptive matters to value ones is possible thanks to *modality*. In similar moral dilemmas, researchers argue, the relevant judgments are modal in nature as the analyzed sentences become contextually modalized containing no modal verbs in them, or modal-like words. Arguably, they follow the narrow view of modality in these experiments; scholars have intended semantic explanations based on contextuality and probabilities (following Kratzer, 1981), but they claim that this model fails to explain the effect, probably, because words are not monosemic. They manifest the need for novel research approaches to understand how modality plays a pivotal role in ToM-MC (Knobe & Gendler, 2013). Therefore, the question that emerges from these arguments, and the one this research tries to answer, is how do linguistic modalities interact with ToM and MC?

Methodology

The main unit of analysis is what turned out to be called “the linguistic modalities” (Gosselin, 2010). As the six types of modalities appear to be pivotal for language, both for the constitution of thought and communication (Gosselin, 2010), there are important implications for the cognitive, social, and communicative systems. With that in mind, the paradigm that matches this category, present in ToM and MC, is the functional-cognitive one, which offers the possibility to replicate the study and transfer its findings to certain contexts, but not all (Savoie-Zajc & Karsenti, 2000). In consequence, the study is heterogenous, leading to the possibility of having a Societal Cognitive Linguistics where linguistic modalities, ToM and MC interact. Hence, qualitative information is appropriate for the study, so that we can comprehend the structure and functions of cognitive, linguistic and societal systems regarding modalities. As a result, the privileged observational stance we have, leads us to in-depth comprehension of the emergent meanings (Deslauriers, 2019).

In the kind of research where meaning is constructed *in situ*, favoring the possibility for individuals' actions, intentions, morality and normativity to take place, it seems that ethnomethodology⁵⁶ is a design where language, communication and interaction are at the center of interest. Specifically, ethnomethodology is "the study of the techniques that individuals use to make sense of everyday social environments, and the common-sense strategies that they use in these environments to accomplish the tasks of communicating, making decisions and reasoning" (Gall, Borg, & Gall, 1996, pp. 626). Said otherwise, ethnomethodology provides the necessary resources for comprehending the moments in which individuals predict others' behavior, whether moral or not, as well as the mechanisms at play in such a process. Finally, as the study contemplates a bimodal empirical approximation to mental representations by the means of linguistic and body markers, it requires an elaborated discourse analytic method.

Regarding the working unit, Canales and Peinado (2007) suggest an average of sixteen participants in studies where there are discussion groups. The 16 participants of the study, living in Armenia, Quindío, will carry out several communicative and interactive actions during the research field work. Indeed, they will participate in answering a moral dilemma, take part in a group discussion and enroll in an individual semi-structured interview; all actions are directed to the same topic: protecting the environment. Evidently, there are some criteria for individuals to participate. It is required that they 1) fill out the informed consent, 2) are from 20 to 40 years old, 3) possess a high school diploma, but not further, 4) manifest a good psychological status, 5), manifest a clear report regarding legal problems, 6) and succeed the Knobe Effect Task.

The unit of analysis for this study concerns the subject's predications in the different communicative scenarios. In cognitive semantics, predications are the relations between actions (or states) that relate to the arguments (predicates) in the enunciation;

⁵⁶ Garfinkel (1967) postulated that ethnomethodology aims at emphasizing the imperative role of cognition in the organization of social activities (Firth, 2010).

such predications are the bridge to have an approximation to mental representations (Gosselin, 2010). *Grosso modo*, there are four categories of predications, namely, propositional operators, meta-predicates, predicative transparent operators, and the simple predicative operators (Gosselin, 2010). Hence, this is the primary level of analysis, where flow the interaction of markers that express modalities in ToM-MC. The outstanding point is that in this research, important attention is given to the embodied (concrete) markers that help expressing language specific traits, like modality (Boutet, 2018; Culson and Ying; 2014).

This study embraces discussion groups, open interviews and the Knobe Effect Task as data collection instruments. The reasons behind these instruments' selection are clear-cut. First, coming from a linguistics tradition (Jakobson, 1976), discussion groups promote the metalinguistic function of language, in which a certain discourse refers to other social discourses, carried out *in situ* (like moral discourses). Second, open interviews lead to the promotion of the emotive function of language (Alonso, 2007), in which individuals' normativity, ToM, and MC flourish. Finally, the Knobe Effect Task, coming from Experimental Psychology, is fully language dependent as scholars have identified the transition from a purely referential function of language to the emotive one (Knobe and Gendler, 2013). All in all, these instruments are key to approaching the mental and social representations.

The field work contemplates five phases, preceded by a preliminary one. In the preliminary phase, the aim is to validate and apply the instruments for perfecting the details, searching for internal and external validity (Hernández, Fernández and Bautista, 2007). More schematically, this phase consists of the application of the instruments in a shorter scale. During phase 1, the 16 participants of the study are going to take The Knobe Effect Task; this task's objective is to verify if individuals' normative considerations affect their ToM in the absence of specific markers denoting moral issues. Evidently, the application of this task is aimed at reaching the function and functioning of linguistic, social

and cognitive aspects involved in thought construction, anchored to the frameworks of ToM and MC.

After having completed the Knobe Effect Task, participants will be invited to enroll in a semi-structured interview, phase 2. As such, the objective is to get to know the reasons as to why the participants selected a specific statement in the Knobe Effect Task, that is, their mental representations behind their choice in the moral dilemma. As it can be observed, it is in this phase where the societal aspects emerge, so the characterization of the societal system becomes richer, dealing with at least joint attention and action, and a common ground in the conversation. Phase 3 is directed to the discussion groups. In this phase, the objective, dealing with the same topic, is to decipher all the linguistic, societal and communicative systems in the framework of ToM-MC. For subjects not to fall into repeating information already provided in the semi-structured interview, they will be given some statements to discuss (e.g., Do I apply any actions to protect the environment? Are they sufficient?) Remarkably, in this phase, there might be a flow of communication from thought to linguistic behavior to social interactions, which represents an ideal scenario for comprehending the interaction of linguistic modalities with ToM and MC.

Phases 4-5 are devoted to the analysis of the data and the concluding academic communications. In phase 4, the empirical data concerning the linguistic system will help us understand how modalities are present in thought, that is, the intra-individual system. Also, the collected information regarding the cognitive system will help us understand the way in which modalities co-occur with other cognitive processes. Thus, the information attached to the societal system will contribute to understanding the role those social abilities have for contributing to the linguistic modalities and all the way around, that is, the interindividual system. In phase 5, all the oral and written reports will be shared.

Results

The main results of this study will be framed in the specific objectives of the study: 1) to characterize the linguistic, the cognitive and the societal systems that emerge within the framework of ToM and MC; 2) to comprehend the structure and the function of linguistic modalities within the same framework; and 3) to comprehend the functioning of linguistic modalities within the very same framework. The overall outcome will be the comprehension of linguistic modalities' interaction with ToM and MC. Hence, a more detailed comprehension of individuals' performance on the False Belief Task and on the Knobe Effect one will be portrayed.

Another result to come is the verification of the specific hypotheses of the study that will lead to the general one. We suggest the following specific hypotheses: 1) linguistic modalities are a socio-cognitive embodied ability in human beings; 2) linguistic modalities cover the following basic socio-cognitive processes: perspective taking, psychosocial force, and virtual or real movement; 3) linguistic modalities could interact with ToM and MC. If the previous hypotheses are proven right, there will be room to suggest that linguistic modalities' interaction with ToM and MC is comprehended via the socio-cognitive embodied mind. In that way, the linguistic modalities will enrich the understanding we have about ToM and MC, as these ToM and MC will depend on the faculty of language, thought, social abilities and embodiment in human beings. Thanks to the study in progress, such a categorical outcome has begun to be supported, as it will be explained in the following proposal.

In his theory, Gosselin (2010) described, characterized, and applied all the parameters of the six categories of linguistic modalities, following a post-modular semantic and cognitive tradition, for the construction of mental representations. Every type of modality is determined by eight specific conceptual and functional parameters, and a meta-parameter. That is, all the morpho-lexical units in the predication interact so as to validate or invalidate a mental representation. From the predication itself, one can infer the mental mechanisms that support the various types of modalities. The first

parameters are conceptual in nature; they are the Instance of Validation (I), the Direction of Adjustment (D), and the Force of Validation (F).

For parameter I, it is admitted that individuals dock their representations to either reality, subjectivity, or institutional stances. If the I parameter is the reality, the individual inhibits his point of view and looks for expressing an objective truth. On the contrary, if the I parameter is subjectivity, there is no inhibition of the individual's point of view, which entails that the subject is expressing an opinion about a truth, that is, a belief. Beyond these two instances, institutions can also take place (e.g., morality, law, and justice). Schematically, if I parameter is reality, then the alethic modalities take place; if it is subjectivity, it brings in either an epistemic modality (opinions about a truth), an appreciative modality (expressing the aesthetics) or a volitive one (having to do with willingness). Thus, if the I parameter is an institutional stance, the deontic modality (expressing obligation) and the axiological one (about good or bad) are at play. Examples are provided as follows: "A triangle has necessarily three sides". "Certainly, Paul is higher than two meters". "This soup is good". "I would like him to come". "You must leave the room immediately". "It is so good that I lent him the money" (Gosselin, 2001, pp. 59-60).

Remarkably, D parameter in the alethic, epistemic, appreciative, and axiological modalities is descriptive, that is, the enunciations must adjust themselves to the world as it is, while the D parameter of the deontic and volitive modalities is the opposite, prospective, where the world may have to adjust itself to the enunciation. As a result, parameters I and D classify the types of modalities in the Latin-Greek tradition. Beyond, there is a continuum for individuals to express modality within a certain degree of force and towards a certain direction (parameter F). In fact, individuals express modality according to the maximal validation (the necessary: alethic modality; the obligatory: deontic modality, etc.), the total invalidation (the unwillingness: volitive modality; the laudable: axiological modality), and some points in between (the contingent and the possible: alethic modality; the facultative: deontic modality, etc.). Finally, the other parameters correspond to the logical, syntactic, pragmatic, temporal, relative, and

enunciative concepts (in a *mutatis mutandis* strategy) that explain the functioning of modalities at the level of the predication.

Gosselin (2010) contemplated that other traditions' object of study *vis-à-vis* modality are too narrow for explaining the social, linguistic and cognitive phenomena involved in the process of representation making. What is more, his theory stipulates that each of the parameters depicted above function depending on specific rules in a post-modular way and interact with the modules and rules among them as well; for explaining this, he adopted the conceptual space (Gärdenfors, 2000), where the representations are constructed, preceding the intermodular architecture and processes of the linguistic modalities' parameters.

This post modular stance indicates that language co-occurs with other cognitive processes (Karmiloff-Smith, 1992), namely, perceptual experience, simulation, imagination, etc. (Gosselin, 2010). However, the dynamic paradigm in cognitive sciences suggests that all forms of cognition depend on body faculties, the properties of the physical world and the cultural schemas (Sinha, 2007). Thus, the parameters of linguistic modalities must meet the criteria of the Embodied Mind Hypothesis, so that modalities are not only conceptual, but also embodied (Lakoff and Johnson, 1999). Hence, the conceptual space where representations are constructed, validated and unvalidated, depends not only on the intermodular functioning of the parameters, but also on the concrete part of cognition, that is, proprioception, interoception and kinaesthesia (Barsalou, 1999). As a result, we consider that ToM and MC are also embodied, as they depend upon all the functioning of linguistic modalities in the sense we are suggesting. In detail, for the subject to validate/invalidate a mental representation, he uses his body, the concrete part, and all the mechanisms for it to happen in the mind.

To illustrate, the I parameter could be equivalent to perspective taking (the subject has three possibilities to switch his source of validation: objectivity, subjectivity, institutions). Also, the metaphorical world of the external reality in the mind is possible via

the use of containers located topographically in the mind. We will argue that both parameters I and D acquire the form of containers for the individual to achieve all the conceptual linguistic modalities' parameters. What comes next is that the Embodied Mind Hypothesis stipulates some universals in cognition, namely, (real or virtual) movement, force dynamics and containers. Therefore, for linguistic modalities to exist ToM and MC are nothing but a context to make it evident. In addition, the bodily movements and signs produced along discourse are better comprehended considering the Embodied Mind Hypothesis; research supports this view in scenarios where the hands, head and eyes' movements indicate negatives, questions, assertions, that is, epistemic instances of the mind, objective descriptions of reality, volition, morality, and so on (Boutet, 2018; Culson and Ying; 2014).

Conclusions

The study has not arrived at categorical conclusions yet (waiting for the data collection and analysis). Nevertheless, we have achieved a theoretical view that will become a theoretical model to comprehend the ways humans make representations from the body, and the role linguistic modalities play for humans to predict others' actions, feelings, and wishes, as well as for the moral cognition that drives their lives. We are aware of other theoretical approximations to explain ToM and MC from language (Searle, 1964; Lakoff and Johnson, 1999; Knobe and Gendler, 2013; Rodríguez, 2018), none of such theoretical approximations embraces modality in an embodied way. Although the analytical process represents a major challenge, the study may help us understand why humans make moral decisions in a certain way and, by the way, why some ADS children pass the FBT and some neurotypicals fail it. A further outcome will be the rise of interest that other disciplines could have for the results of the study, say psychology, law, and education, among others.

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