Scientific papers

Scientific papers

Different types

Research papers
Case report
Review
Meta-analyses
Letter to the editor

Scientific papers

Research article

This is the most important type of paper. It provides new information based on original research. This category of paper is usually prospective and is supported by in-depth statistical analysis. The conclusions should be supported by the data provided in the results.

Introduction	What question is asked
Materials & Methods	How is it studied (recipe)
Results	what is found
Discussion	what do the findings mean

Different types

Case report

This is a description of a single case with unique features. These unique features may consist of previously- unreported observation of a recognised disease, The unique use of imaging or diagnostic test to reveal a disease, previously-unreported clinical condition, previously-unreported treatment in a recognised disease,
or previously-unreported complication of a procedure.

Case Reports are usually short and focused.

Review

This is a detailed analysis of recent developments on a specific topic. It serves to highlight important points that have been previously reported in the literature. This type of paper does not introduce new information and does not include the author's opinion or personal experience.

A large number of relevant references are expected.

Reviews should consist of the following headings: unstructured abstract, introduction and subheadings.

Scientific papers

Meta-analyses

A meta-analysis is a statistical analysis that combines the results of multiple scientific studies.

Meta-analysis can be thought of as "conducting research about previous research."

Letter to the editor

Many journals have a Letter or Correspondence section. Letters are usually short and can be written on any subject of interest to the journal reader, including comments on previously-published articles. These comments should be objective and constructive.

This is a Research paper, Case report, Review, Meta-analysis, Letter to the editor

Meta analysis

Language processing in context requires more than merely comprehending words and sentences. Important subprocesses are inferences for bridging successive utterances, the use of background knowledge and discourse context, and pragmatic interpretations. The functional neuroanatomy of these text comprehension processes has only recently been investigated. Although there is evidence for right-hemisphere contributions, reviews have implicated the left lateral prefrontal cortex, left temporal regions beyond Wernicke's area, and the left dorso-medial prefrontal cortex (dmPFC) for text comprehension. To objectively confirm this extended language network and to evaluate the respective contribution of right hemisphere regions, meta-analyses of 23 neuroimaging studies are reported here.

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Case report

As part of a presurgical investigation for a resection of a tumor located in the left temporal brain region, we evaluated pre- and postsurgical language lateralization in a right-handed boy with refractory epilepsy. In this study, we compared functional near infrared spectroscopy (fNIRS) results obtained while the participant performed expressive and receptive language tasks with those obtained using functional magnetic resonance imaging (fMRI). This case study illustrates the potential for NIRS to contribute favorably to the localization of language functions in children with epilepsy and cognitive or behavioral problems and its potential advantages over fMRI in presurgical assessment. Moreover, it suggests that fNIRS is sensitive in localizing an atypical language network or potential brain reorganization related to epilepsy in young patients

Scientific papers

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Review

Language processing is a trait of human species. The knowledge about its neurobiological basis has been increased considerably over the past decades. Different brain regions in the left and right hemisphere have been identified to support particular language functions. Networks involving the temporal cortex and the inferior frontal cortex with a clear left lateralization were shown to support syntactic processes, whereas less lateralized temporo-frontal networks subserve semantic processes. These networks have been substantiated both by functional as well as by structural connectivity data. Electrophysiological measures indicate that within these networks syntactic processes of local structure building precede the assignment of grammatical and semantic relations in a sentence. Suprasegmental prosodic information overtly available in the acoustic language input is processed predominantly in a temporo-frontal network in the right hemisphere associated with a clear electrophysiological marker. Studies with patients suffering from lesions in the corpus callosum reveal that the posterior portion of this structure plays a crucial role in the interaction of syntactic and prosodic information during language processing

Scientific papers

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Research paper

For over a century neuroscientists have debated the dynamics by which human cortical language networks allow words to be spoken. Although it is widely accepted that Broca's area in the left inferior frontal gyrus plays an important role in this process, it was not possible, until recently, to detail the timing of its recruitment relative to other language areas, nor how it interacts with these areas during word production. Using direct cortical surface recordings in neurosurgical patients, we studied the evolution of activity in cortical neuronal populations, as well as the Granger causal interactions between them. We found that, during the cued production of words, a temporal cascade of neural activity proceeds from sensory representations of words in temporal cortex to their corresponding articulatory gestures in motor cortex. Broca's area mediates this cascade through reciprocal interactions with temporal and frontal motor regions. Contrary to classic notions of the role of Broca's area in speech, while motor cortex is activated during spoken responses, Broca's area is surprisingly silent. Moreover, when novel strings of articulatory gestures must be produced in response to nonword stimuli, neural activity is enhanced in Broca's area, but not in motor cortex. These unique data provide evidence that Broca's area coordinates the transformation of information across large-scale cortical networks involved in spoken word production. In this role, Broca's area formulates an appropriate articulatory code to be implemented by motor cortex

This is a Research paper, Case report, Review, Meta-analysis, Letter to the editor

Meta analysis

Semantic memory refers to knowledge about people, objects, actions, relations, self, and culture acquired through experience. The neural systems that store and retrieve this information have been studied for many years, but a consensus regarding their identity has not been reached. Using strict inclusion criteria, we analyzed 120 functional neuroimaging studies focusing on semantic processing. Reliable areas of activation in these studies were identified using the activation likelihood estimate (ALE) technique. These activations formed a distinct, left-lateralized network comprised of 7 regions: posterior inferior parietal lobe, middle temporal gyrus, fusiform and parahippocampal gyri, dorsomedial prefrontal cortex, inferior frontal gyrus, ventromedial prefrontal cortex, and posterior cingulate gyrus. Secondary analyses showed specific subregions of this network associated with knowledge of actions, manipulable artifacts, abstract concepts, and concrete concepts. The cortical regions involved in semantic processing can be grouped into 3 broad categories: posterior multimodal and heteromodal association cortex, heteromodal prefrontal cortex, and medial limbic regions. The expansion of these regions in the human relative to the nonhuman primate brain may explain uniquely human capacities to use language productively, plan, solve problems, and create cultural and technological artifacts, all of which depend on the fluid and efficient retrieval and manipulation of semantic knowledge

Scientific papers

This is a Research paper, Case report, Review, Meta-analysis, Letter to the editor

Letter to the editor

McDonald *et al*. (2006) report that patients who complain of difficulty in reading following left occipitotemporal infarction with right homonymous hemianopia, when asked to read short passages of text, tend to fixate to the left of the position fixated by normal readers in words with four or more letters. This pattern of fixation causes more letters to fall within the defective right visual field. Fewer letters fall within the intact left visual field, so that additional fixations may be required for the word to be identified. Furthermore, the patients' fixations are longer than those of normal readers. The authors conclude that the patients' scan paths are inefficient, as one might expect patients to fixate to the right of the position fixated by normal subjects to compensate for the right hemianopia by allowing more letters to fall within the intact left visual field.

I (Levine and Calvanio, 1978) and others (Kinsbourne and Warrington, 1962) have investigated the capacity of such patients to identify multi-letter arrays, including words, in the intact left visual field. We have consistently found a reduction in the visual letter span. That is, when a group of letters is displayed simultaneously to the left parafoveal visual field, these patients are able to identify fewer letters than normal subjects. The problem is not one of acuity, as the identification of single letters is unimpaired. The problem seems to be that the occipitotemporal lesion disrupts pathways connecting the right occipital lobe to the language-dominant left hemisphere that are required for efficient visual identification of multi-letter arrays required for normal reading

Our findings suggest an explanation of the results of McDonald *et al*. (2006). The patients fixate to the left of the normal position because they can process fewer letters per fixation in their intact left visual field. Given their limited capacities in the left field, the patients may indeed be pursuing the most efficient strategy for reading available to them. This hypothesis can be tested by correlating the degree of leftward fixation with the reduction of visual letter span in a group of similar patients.

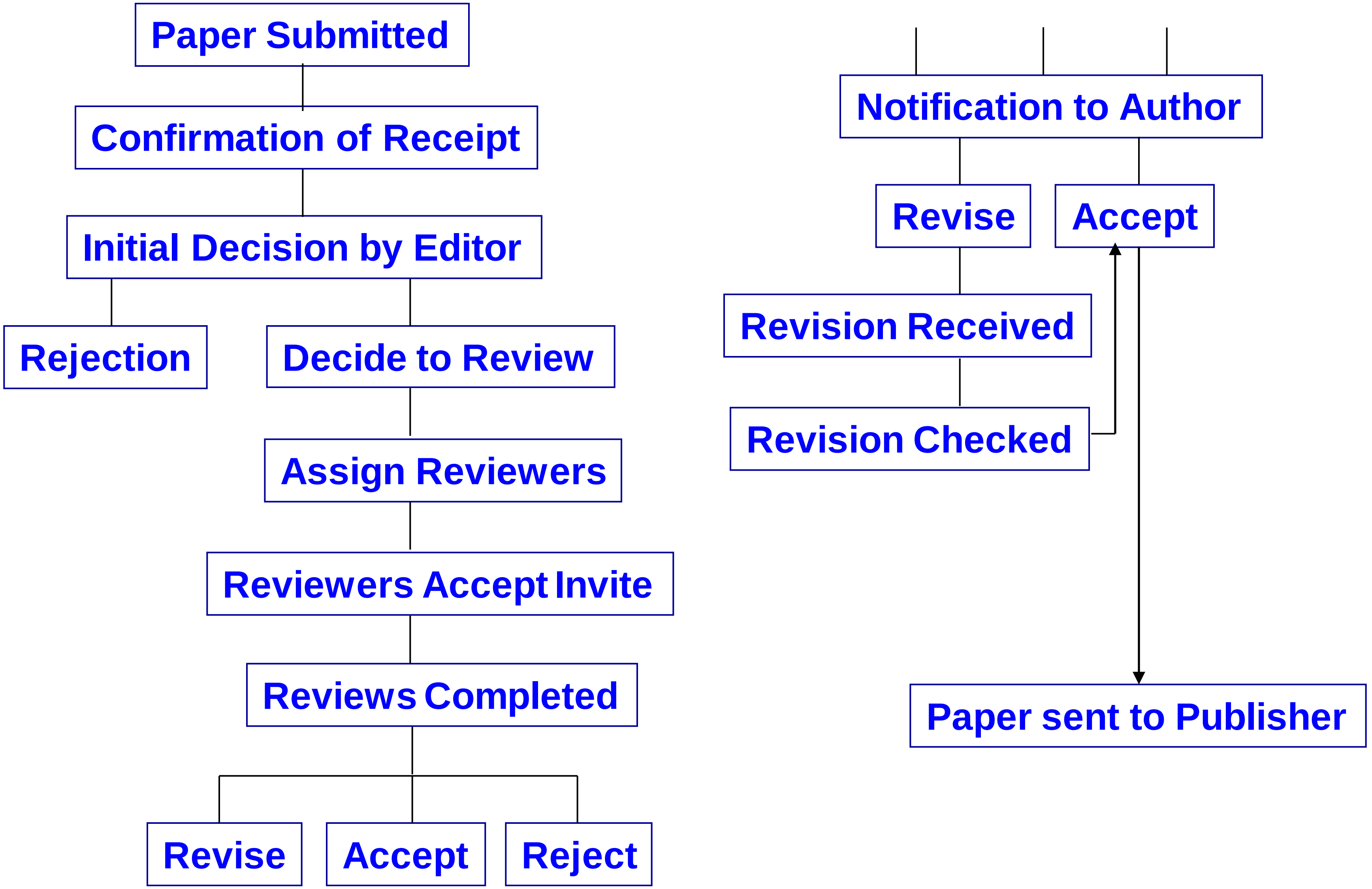
Impact factor

Impact Factor	Journal Title	Impact Factor (2015)		
53,486	NATURE	41.456	A++	>9
39,123	NATURE REVIEWS MOLECULAR CELL BIOLOGY	37.806	A+	>6
36,28	SCIENCE	33.611	A	>5
34,317	CELL	32.242		
32,403	NATURE REVIEWS NEUROSCIENCE	31.427		
31,201	NATURE MEDICINE	28.223		
30,445	CANCER CELL	23.523		
25,737	Cell Stem Cell	22.268		
25,421	TRENDS IN COGNITIVE SCIENCES	21.965		
25,056	LANCET NEUROLOGY	21.896		
23,462	BEHAVIORAL AND BRAIN SCIENCES	20.771		
22,462	NATURE CELL BIOLOGY	19.679		
19,488	Annual Review of Neuroscience	19.320		
15,836	Cell Metabolism	17.565		
	British Medical Journal			
15,531	Advances in Anatomy Embryology and Cell Biology	17.000		
14,736	Annual Review of Cell and Developmental Biology	16.660		
14,69	NATURE NEUROSCIENCE	16.095		
14,235	Science Translational Medicine	15.843		
14,178	Nature Reviews Neurology	15.358		
14,03	NEURON	15.054		
13,853	MOLECULAR PSYCHIATRY	14.496		
13,668	MOLECULAR CELL	14.018		
13,668	TRENDS IN NEUROSCIENCES	13.555		
13,608	NATURE STRUCTURAL & MOLECULAR BIOLOGY	13.309		
13,104	CELL RESEARCH	12.413		
13,069	Alzheimers & Dementia	12.407		

Impact factor

9,97			BRAIN	9.196
9,85			EMBO REPORTS	9.055
9,79			NEUROSCIENCE AND BIOBEHAVIORAL REVIEWS	8.802
9,681			Cold Spring Harbor Perspectives in Biology	8.679
9,647			CEREBRAL CORTEX	8.665
9,457			SLEEP MEDICINE REVIEWS	8.513
9,32			CURRENT OPINION IN CELL BIOLOGY	8.467
9,205			ONCOGENE	8.459
8,874			Cell Reports	8.358
8,849			NEUROLOGY	8.185
8,65			CELL DEATH AND DIFFERENTIATION	8.184
			BRTITISH JOURNAL OF PSYCHIATRY	
8,312			CURRENT OPINION IN GENETICS & DEVELOPMENT	7.574
8,283			ARCHIVES OF NEUROLOGY	7.419
7,991			Social Cognitive and Affective Neuroscience	7.372
7,804			JAMA Neurology	7.271
7,804			CURRENT OPINION IN STRUCTURAL BIOLOGY	7.201
7,781			NEUROPSYCHOPHARMACOLOGY	7.048
7,667			FRONTIERS IN NEUROENDOCRINOLOGY	7.037
7,636			Journal of Molecular Cell Biology	6.870
7,584			NEUROSCIENTIST	6.837
7,499			JOURNAL OF NEUROLOGY NEUROSURGERY AND PSYCHIATRY	6.807
7,453			NEURO-ONCOLOGY	6.776
7,444			AGEING RESEARCH REVIEWS	6.634
7,742			CURRENT OPINION IN NEUROBIOLOGY	6.628
7,396			Molecular Neurodegeneration	6.563
7,355			STEM CELLS	6.523
7,143			Aging-US	6.432
[illegible]			[illegible]	[illegible]

Overview of Peer Review Process



Research article

Gervais H *et al*, 2004, "Abnormal cortical voice processing in autism", *Nature Neuroscience*, doi: 10. 1038/nn1291

1. What does *et al* mean?

And collaborators

Gervais, Belin, Boddaert, Leboyer, Coez, Sfaello, Barthélémy, Brunelle, Samsom, Zylbovicious

2. Any idea about the order of the authors?

1st author carried out the study,
2nd one: same participation as the 1st one
the last one: head of the laboratory/ main researcher
The others participated in the study

First one: 50 points, 2nd one: 50 points, the last one: 50 points
The others: 20 points

Research article

Table 1: Alignment of sections of a scientific paper with the processes of scientific method

Structural sections of a scientific paper	Scientific method
Introduction	Ask a question, Background research, Construct a hypothesis *
Methods/ design	Test hypothesis
Results	Analyse data
Discussion (and conclusion)	Draw conclusion
Whole paper	Communicate research

**Hypothesis: Idea or proposed explanation for something that you test through scientific method, usually resulting in the collection of information/ data for analysis.*

Research article

How to go about it:

1. Screen the title to see if the paper is relevant for your purpose. If uncertain check the abstract for more detail to determine if the paper is relevant.

2. Once you have determined the paper is likely to be relevant, read the abstract in detail to get an idea of the key findings and how the research was approached.

Research article

How to go about it:

3. Apply your knowledge on the structure and relevance of each section to interpret and evaluate the paper :

i. Read through the introduction to get an understanding of what is known in the area and the reason or purpose of the research (or paper). Ask yourself if the purpose is clear and justified from the background information provided in the introduction?

ii. Read the methods section in detail to understand and critically evaluate the design of the study. Ask yourself: is the study well designed?; have the researchers tried to eliminate things that may influence the results other than the variables of interest (i.e. minimised sources of bias)?; are the results likely to be reliable and can they be reproduced?

Research article

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iii. Read the results section in detail, including the figures and tables, to interpret what the results indicate in terms of answering the research questions/ aims proposed in the introduction. Draw conclusion from these results. (As beginners in studying the sciences, the discussion/ conclusion sections will be helpful to interpret the results of the paper).

iv. Read the discussion with purpose to get an understanding of the authors' interpretation of their results in the context of other scientific literature. There may also be information about limitations of the researchers' work and directions for further research. A conclusion should be provided in terms of an interpretation of the key findings in the context of the research aims/ question (this may be in a separate section labelled 'conclusion').

Order of typical elements included in an abstract

Background
1: some background information
2: the principal purpose of the study
3: some information about the methodology of the study
4: the most important results of the study
5: a statement of conclusion

Questions
1. Analyze each sentence for the type of information it contains and identify the different parts (1, 2, 3, 4, 5)
2. Which element is represented by the most number of sentences?
3. Has an element been eliminated?
4. What verb tenses and aspects are used in each sentence? Can you draw a conclusion from your results?

Abstract version 1

Even if the lateralization of speech prosody has been the object of many studies, it still remains a matter of debate. Using fMRI and long connected speech stimuli, we addressed the question of neuronal networks involved in prosodic integration by comparing (1) differences in brain activity when hearing connected speech stimuli with high and low degrees of prosodic expression; (2) differences in brain activity in two different diotic listening conditions (normal speech delivery to both ears, i.e., NN; and low-pass filtered speech delivery to both ears, i.e., FF); and (3) effects of the same connected speech stimuli in these two listening conditions. Twelve right-handed French men listened passively to the stimuli. Each stimulus induced a specific cerebral network, the flat one weakening activations, which were mainly reduced to the bilateral STG for both listening conditions. High degrees of prosodic information were found to trigger right specific activations in a wider neuronal network involved in speech integration (such as BA44, BA21-22 and BA39-40) than low degrees of prosodic information did. More precisely, the right BA44 was found to be specifically involved in the process of F_0 modulations which are the main acoustic correlate of prosody. Not only do the results achieved in the present experiment using thirty-second long connected speech stimuli show the involvement of a bilateral neuronal network but they also strongly suggest that high degrees of prosodic information elicit activations in a wider neuronal network involved in speech perception than low degrees of prosodic information do.

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Abstract 2

Auditory functional magnetic resonance imaging tasks are challenging since the MR scanner noise can interfere with the auditory stimulation. To avoid this interference a sparse temporal sampling method with a long repetition time (TR = 17 s) was used to explore the functional anatomy of pitch memory. Eighteen right-handed subjects listened to a sequence of sine-wave tones (4.6 s total duration) and were asked to make a decision (depending on a visual prompt) whether the last or second to last tone was the same or different as the first tone. An alternating button press condition served as a control. Sets of 24 axial slices were acquired with a variable delay time (between 0 and 6 s) between the end of the auditory stimulation and the MR acquisition. Individual imaging time points were combined into three clusters (0–2, 3–4, and 5–6 s after the end of the auditory stimulation) for the analysis. The analysis showed a dynamic activation pattern over time which involved the superior temporal gyrus, supramarginal gyrus, posterior dorsolateral frontal regions, superior parietal regions, and dorsolateral cerebellar regions bilaterally as well as the left inferior frontal gyrus. By regressing the performance score in the pitch memory task with task-related MR signal changes, the supramarginal gyrus (left>right) and the dorsolateral cerebellum (lobules V and VI, left>right) were significantly correlated with good task performance. The SMG and the dorsolateral cerebellum may play a critical role in short-term storage of pitch information and the continuous pitch discrimination necessary for performing this pitch memory task.

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Abstract 3

Over the past 30 years, advances in radiotracer chemistry and positron emission tomography instrumentation have merged to make positron emission tomography a powerful scientific tool in the biomedical sciences. However, despite the increasing reliance of the biomedical sciences on imaging and the new needs for functional information created by the sequencing of the human genome, the development of new radiotracers with the specificity and kinetic characteristics for quantitative analysis in vivo remains a slow process. In this article, we focus on advances in the development of the radiotracers involved in neurotransmission, amino acid transport, protein synthesis, and DNA synthesis. We conclude with a brief section on newer radiotracers that image other molecular targets and conclude with a summary of some of the scientific and infrastructure needs that would expedite the development and introduction of new radiotracers into biomedical research and the practice of medicine

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Temporal context information is crucial to understanding human episodic memory. Human lesion and neuroimaging data indicate that prefrontal regions are important for retrieving temporal context memory, although the exact nature of their involvement is still unclear. We employed functional magnetic resonance imaging (fMRI) to elucidate the neural basis of two kinds of temporal context memory: the temporal order of items between lists and within a list. On the day of the fMRI experiment, subjects memorized a list of 30 pictures in the morning and another list of 30 pictures in the afternoon. During the scanning session, the subjects performed three tasks. In a between-lists task, they were asked to judge the temporal order between two items that had been presented in different lists. In a within-list task, they were asked to judge the temporal order between two items that had been presented in a single list. We found bilateral prefrontal activities during these two temporal context memory tasks compared with a simple item-recognition task. Furthermore, in direct comparison between these two tasks, we found differential prefrontal activities. Thus, right prefrontal activity was associated with temporal order judgment of items between lists, whereas left prefrontal activity was related to temporal order judgment of items within a list. These results indicate that retrieval processes of two kinds of temporal context memory are supported by different, but overlapping, sets of cerebral regions. We speculate that this reflects different cognitive processes for retrieving temporal context memory between separate episodes and within a single episode

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Abstract 5

The purpose of the present study was to analyze mother-child collaborative play in children with Autism Spectrum Disorders (ASD) compared to children with Down Syndrome (DS) and typical developing children (TD). Children with ASD are often described as having deficient play skills, particularly in the symbolic domain. Caregivers' involvement in child play activities increases the structural complexity of playing in both typically developing children and children with disabilities. Participants included 75 mothers and their children with ASD (n = 25), with down syndrome (n = 25) and with typical development (n = 25). Mother–child play sessions were analyzed using a coding system for exploratory and symbolic play. Results indicated that children with ASD showed more exploratory play compared to children in the other groups. No significant differences emerged between the three groups for child symbolic play or for mother play. These findings are discussed in relation to the debate about functional and symbolic play in children with ASD and in relation to the importance of setting and age for play assessment.

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Abstract 6

Much of contemporary mainstream formal grammar theory is unable to provide analyses for language as it occurs in actual spoken interaction. Its analyses are developed for a cleaned up version of language which omits the disfluencies, non-sentential utterances, gestures, and many other phenomena that are ubiquitous in spoken language. Using evidence from linguistics, conversation analysis, multimodal communication, psychology, language acquisition, and neuroscience, we show these aspects of language use are rule governed in much the same way as phenomena captured by conventional grammars. Furthermore, we argue that over the past few years the theoretical tools required to provide a precise characterizations of such phenomena have begun to emerge in theoretical and computational linguistics;hence, there is no reason for treating them as 'second class citizens' other than pre-theoretical assumptions about what should fall under the purview of grammar. Finally, we suggest that grammar formalisms covering such phenomena would provide a better foundation not just for linguistic analysis of face-to-face interaction, but also for sister disciplines, such as research on spoken dialogue systems and /or psychological work on language acquisition.

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Abstract 7: find the correct order

A. During our auditory-motor paradigm, all subjects showed activation in areas that belong to an extensive attention network.
B. Each subject was requested to attend to "start" and "stop" commands every 20 s alternatively and had to respond with the motor task every second time.
C. We suggest that although a simple block-designed, auditory-motor paradigm stimulates the attention network, motor preparation, and motor inhibition concurrently, a frequency-based analysis can distinguish attention from motor functions.
D. Due to its simplicity the paradigm can be valuable in studying children with attention deficit disorders.
E. Attention was stimulated during a block-designed, motor paradigm in which a start-stop commands cycle produced activation at the fourth harmonic of the motor frequency.
F. Six adults (30-40 years of age) and one child (10 years) were studied.
G. The purpose of this study was to devise a paradigm that stimulates attention using a frequency-based analysis of the data acquired during a motor task.
H. While the motor-task-related areas were activated with slower frequency than attention, the activation in the attention-related areas was enhanced every time the subject had to start or end the motor task.
I. We disentangled the motor and attention functions using statistical analysis with subspaces spanned by vectors generated by a truncated trigonometric series of motor and attention frequency.
J. Attention and motor functions were co activated but with different frequencies.

Abstract 7: find the correct order Key

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F. Six adults (30-40 years of age) and one child (10 years) were studied.

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E. Attention was stimulated during a block-designed, motor paradigm in which a start-stop commands cycle produced activation at the fourth harmonic of the motor frequency.

I. We disentangled the motor and attention functions using statistical analysis with subspaces spanned by vectors generated by a truncated trigonometric series of motor and attention frequency.

A. During our auditory-motor paradigm, all subjects showed activation in areas that belong to an extensive attention network.

J. Attention and motor functions were co activated but with different frequencies.

H. While the motor-task-related areas were activated with slower frequency than attention, the activation in the attention-related areas was enhanced every time the subject had to start or end the motor task.

C. We suggest that although a simple block-designed, auditory-motor paradigm stimulates the attention network, motor preparation, and motor inhibition concurrently, a frequency-based analysis can distinguish attention from motor functions.

D. Due to its simplicity the paradigm can be valuable in studying children with attention deficit disorders.

Abstract 8: find the correct order

B. ALS patients obtained significantly lower scores than controls on EAT and ET.

G. Twenty-two consecutive, cognitively intact ALS patients, and 15 healthy controls, underwent assessment of executive, verbal comprehension, visuospatial, behavioural and QoL measures, as well as of the ToM abilities by Emotion Attribution Task (EAT), Advanced Test of ToM (ATT) and Eyes Task (ET).

D. As regard to type of ALS onset, patients with bulbar onset performed worse than those with spinal onset on ET.

F. Our results suggest that not only “cognitive” but also “affective” subcomponents of ToM may be impaired in the early stages of ALS, with significant linkage to disease onset and dysfunctions of less executively demanding conditions, causing potential impact on patients' “Mental Health”

C.This study aims at exploring the potential impairment of Theory of Mind (ToM) (i.e., the ability to represent cognitive and affective mental states to both self and others) and the clinical, neuropsychological and Quality of Life (QoL) correlates of these cognitive abnormalities in the early stages of amyotrophic lateral sclerosis (ALS), a multisystem neurodegenerative disease recently recognized as a part of the same clinical and pathological spectrum of frontotemporal lobar degeneration.

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D. Results reveal that judges are able to accurately distinguish truthful clips from lying clips in both perception studies.

B. Even though the automated movement analysis for overall and specific body regions did not yield significant results between the experimental conditions, we did find a positive correlation between the amount of movement in a child and the perception of lies, i.e., the more movement the children exhibited during a clip, the higher the chance that the clip was perceived as a lie.

F. Film fragments from truthful and deceptive children were shown to human judges who were given the task to decide whether the recorded child was being truthful or not.

A. The eye-tracking study revealed that, even when there is movement happening on different body regions, judges tend to focus their attention mainly on the face region.

C. The present study investigates how easily it can be detected whether a child is being truthful or not in a game situation, and it explores the cue validity of bodily movements for such type of classification. To achieve this, we introduce an innovative methodology – the combination of perception studies (in which one uses eye-tracking technology) and automated movement analysis.

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F. Upon reading the last word of each sentence, participants indicated sentence acceptability.
B. However, in the case of orthodox sentences, the critical word elicited a distinctive brain response characteristic of target detection –the P3b– as compared to the other conditions, showing that speakers of Welsh with no expertise of this particular form of poetry implicitly detect poetic harmony.
E. These results show for the first time that before we even consider literal meaning, the musical properties of poetry speak to the human mind in ways that escape consciousness
H. As expected, our inexperienced participants did not explicitly distinguish between sentences that conformed to the poetic rules from those that violated them.
D. The power of poetry is universally acknowledged, but it is debatable whether its appreciation is reserved for experts.
C. We studied the brain response of native speakers of Welsh as they read meaningful sentences ending in a word that either complied with strict poetic construction rules, violated rules of consonantal repetition, violated stress pattern, or violated both these constraints.
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Abstract 11: find the correct order

H. Participants read items in one of three presentation formats (whole sentence, word-by-word, or phrase-by-phrase), rated each item for grammaticality, and responded to a comprehension probe.

A.Materials included simple and complex relative clauses with head nouns and verbs that were either matched or mismatched for number.

C. For the L2 participants however, phrase-by-phrase presentation was not significantly beneficial for agreement processing, and also resulted in lower comprehension accuracy.

I. These differences point to a significant role of prosodic phrasing during agreement processing in both L1 and L2 speakers, additionally suggesting that it may contribute to a cue-based retrieval agreement model, either acting as a cue directly, or otherwise scaffolding the retrieval process.

J. To explore this proposal, the experimental design manipulated text presentation to influence implicit prosody, using sentences designed to induce subject-verb agreement attraction errors.

G. The discussion and results presented provide support both for a cue-based retrieval mechanism in agreement, and the function of prosody within such a mechanism, adding further insight into the interaction of retrieval processes, cognitive task load, and the role of implicit prosody

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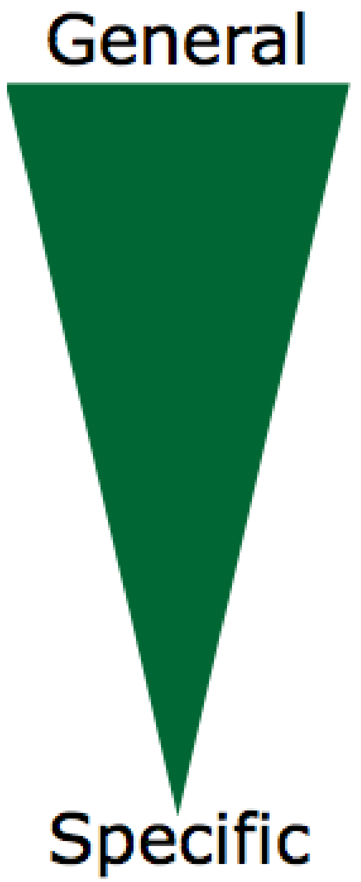
Introduction



- May be the hardest section to write in the manuscript
- Introduce the field of study
- Narrow the focus using specific references
- Justifies the research
- May include a statement of purpose (hypothesis, predictions, purpose, objectives, etc.)

Introduction

- **Clearly** state the:
  - Problem being investigated
  - Background that explains the problem
  - Reasons for conducting the research
- Summarize relevant research to provide context
- State how your work differs from published work
- Identify the questions you are answering
- Explain what other findings, if any, you are challenging or extending
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State how your work differs from published work

Speaking is a unique and defining human behavior. It is carried out by precise, controlled movements of different parts of the vocal tract, known as articulators, which are closely coordinated with the larynx and respiration. Speech articulation is often described as the most complex motor behavior because over 100 muscles are involved, and the movements occur on an extremely rapid time scale. Despite its complexity, nearly all of us learn to master this skill to speak fluently and effortlessly [1]. A key brain area in the neural control of articulation is the ventral portion of the sensory-motor cortex (vSMC). Injuries to this area produce motor deficits in articulation, called dysarthria [2]. In comparison to the dorsal sensor- imotor cortical regions involved in arm reaching and hand function, the neurobiology of vSMC is relatively under-studied. The vSMC features some important anatomic and functional differences from dorsal sensory-motor cortex, while sharing others. For example, in contrast to the dorsal areas, vSMC projects via the corticobulbar tract to the oro-facial motor nuclei, and ultimately to the articulatory muscles. vSMC has connections with higher-order cortical areas such as the anterior cingulate and supplementary motor area, basal ganglia, and cerebellum. In classic studies, the vSMC has been described by its somatotopic organization of face and oro-pharynx repres-entations. These areas are involved in controlling such non-speech movements as facial expressions, tongue movements, and swallowing. However, over the past decade we have begun to learn more about how this same cortical area mediates a totally different functional purpose in the production of vocal speech. The goal of this review is to address the functional organization of the vSMC in the context of speaking, broadly focused on three central topics: firstly somatotopy of speech articulator representations, secondly potential neuroanatomical specializations for speech in humans, and thirdly organization of distributed spatial patterns of cortical activity during speech.

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How do listeners perceive highly variable speech signals? No two naturally produced syllables are exactly alike since their precise acoustic realization varies both within and between speakers. Despite this variability, listeners are typically able to understand speech rapidly and accurately even when it has been significantly degraded (Remez et al. 1981; Shannon et al. 1995; Dupoux and Green 1997; Brungart 2001). These observations suggest that no single acoustic cue is necessary for correct perception of speech sounds. Historically, the absence of reliable acoustic cues to speech sound identification led researchers to suggest that speech is understood by reference to the intended motor gestures of the speaker (Studdert-Kennedy et al. 1970; Liberman and Whalen 2000). Recent demonstrations that motor cortex responds to clear and degraded speech (Wilson et al. 2004; Pulvermüller et al. 2006; Hervais-Adelman et al. 2012) and that transcranial magnetic stimulation (TMS) of motor regions disrupts speech perception (Meister et al. 2007; Möttönen and Watkins 2009) are consistent with a functional role of motor cortex in perception. Yet, the nature of motor contributions to speech perception remains controversial (Lotto et al. 2009; Scott et al. 2009), and the neural mechanisms by which motor representations are accessed from speech remain underspecified.

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 Current Biology 25, 3079–3085, December 7, 2015

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