Titulo

**Abstract**

**Introduction**

Punteo de Ale

"En los ùltimos 20 años el estudio de los procesos cognitivos involucrados en tareas de categorizaciòn mostró un desarrollo notable. Por otra parte, el desarrollo de las metodologías de neuroimágenes ha permitido también ahondar en la ndéficits de categorización obserevados en una población eurobiología subyacente al proceso de categorización. Los estudios llevados a cabo tanto en sujetos neurotípicos como distintos tipos de poblaciones con trastornos neurológicos de distinta etiología, han permitido sentar las bases para la comprensión de la neuropsicología subyacente al proceso de categorización en humanos. En el presente trabajo nos interesa revisar dicha literatura, con el objetivo central de entender los déficits de categorización observados en la población de pacientes del Espectro autista, intentando explicar los déficits observados en función de nuestro conocimiento actual de la neurobiología del proceso de categorización porun lado, y de los trastornos del neurodesarrollo observados en la población del Espectro autista. "

Traduccion

Over the last twenty years research on cognitive processes that involve categorization has shown considerable growth. On the other hand, the development of neuroimaging technology, gave us the possibility to answer questions about populations with different neurological backgrounds that underlies categorization deficits.

Studies done with neurotypical subjects (NT) and subjects with different kinds of neurological disorders have enabled us to build the bases for the comprehension of the neuropsychology underlying categorization process in humans.

The goal of the current work is to read through the literature about the subject, to help us understand deficits on categorization observed in patients of the autistic spectrum, through the lens of our current knowledge of the neurobiology of categorization process and the disorders on the neurodevelopment of the autistic spectrum population.

To aim the current goal it will be necessary to review the neurological bases of category learning on neurotypical populations, in autistic spectrum populations, and on the neurological differences we find from neuroimaging studies.

This review will not consider categorization learning of highly experienced experts. There is a gross amount of evidence that points that the neurological pathways and neural mechanisms that lead to new category learning are quite different from those that lead to representation of highly learned categories.

Categorizacion involves creating a trace of memory that enables us to respond differently to objects and events that respond to different classes or categories. It is of most importance to be able to relate with our environment.

It is possible to identify three distinct tasks that involve categorization, and that are thought to have different neural mechanisms behind; rule-based categorization, information integration and prototype learning. There is growing body of evidence supporting that different kinds of categorization involve different neural substrates with commonalities (Ashby & Ell, 2001, 2002; Erickson & Kruschke, 1998; Maddox & Ashby, 2004; Pickering, 1997; Reber & Squire, 1994; Smith, Patalano, & Jonides, 1998; however, see Nosofsky & Johansen, 2000).

Rule category learning tasks are those in which the category can be learnt through explicit reasoning. Gabor patches are an example of stimuli used to create categories that are easily solved by an explicit rule.

Information integration tasks involve the integration of the information given by at least two stimuli in a predecisional stage (Ashby & Gott, 1988). The combination of the perceptual information given by theme is difficult to express verbally.

Prototype learning tasks are those in wich a category is made by creating a category prototype (Posner & Keele 1968, 1970). The rest of the exemplars of the category are crated by adding different levels of distortion on to the category prototype. Dot patterns are the most common kind of this type of task.

There's a body of evidence that supports that within the first year typically developed infants are able to form prototype of objects (Younger 1990), dot patterns (Younger and Gotlieb 1988) and faces (Rubenstein et al.1999; Strauss 1979). Prototype formation involves laying a memory trace that has an average of the variations you can find in a certain category. The benefit of forming a prototype is to reduce the memory load when forming a category. It's an example of implicit learning.

The reason why we choose to review literature in these three category structures its because on its results they show us that there are empirical differences between themes that may allow us to a better understanding of the neuropsychology behind theme.

**Literature search criteria**

Our research was based on the sites PubMed and Google Scholar. The search was focused on categorization processes, particularly on ruled-based categorization, information-integration categorization and prototype formation. We combined the following concepts “Rule based categorization”, “information-integration categorization”, “prototype formation”, “conceptualization”, “concept formation”, “autistic spectrum disease”. We added our interest in neurophysiological research so we included the terms “neuroimaging”, “TDCs”.

The citations on each relevant paper were checked to look for other relevant information in the field. Only English written publications were included in this work. Papers published before march of 2020 were included.

All the information from each paper was gathered and evaluated on the following aspects a) population (including demographics, native language, age, etc.); b) type of stimulus; c) social cognition tasks and/or questionnaire used; d)neuroimaging techniques applied; and (e) main behavioral and neuroimaging results.