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Short article

The more intelligent people are, the more they use tools

Plus nous sommes intelligents et plus nous utilisons des outils

J. Navarro[a,*], F. Osiurak[a,b]

[a] *Laboratoire d'Étude des Mécanismes Cognitifs (EA 3082), Université Lyon 2, 69676 Bron, France*
[b] *Institut Universitaire de France, 75231 Paris, France*

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ABSTRACT

There are several apparent reasons for people to use tools, such as to save time and effort, or to earn money. In this report, a potentially deeper reason is pointed out: people's intelligence. We show that intelligence level is linked to the propensity to use tools or more specifically an automatic tool. In our experiment, when confronted to choose between a manual or a tool assisted task completion, the most intelligent participants used the tool more often that other participants. This link was not found with other measures such as personality factors. This finding support the idea that human intelligence might be considered as an evolutional advantage that once helped our ancestors to survive. Nowadays, human intelligence is still favoring more effective tool use over manual performance. That would also explain the fact that humans conceive and use an exponential number of tools.

Mots clés :
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RÉSUMÉ

Un gain de temps, d'argent ou encore d'effort peut expliquer l'utilisation d'outils. Cet article présente une autre raison plus profonde : l'intelligence. L'étude rapportée ici indique que le niveau

* Corresponding author at: Laboratoire d'Étude des Mécanismes Cognitifs (EA 3082), Institut de Psychologie, 5, avenue Pierre-Mendès-France, 69676 Bron cedex, France.
E-mail addresses: Jordan.Navarro@univ-lyon2.fr (J. Navarro), Francois.Osiurak@univ-lyon2.fr (F. Osiurak).

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Capacités cognitives
Prise de décision
Automatisation

d'intelligence est lié à la propension à utiliser un outil et plus spécifiquement un automate. Dans notre expérience, les participants devaient faire un choix entre la réalisation manuelle d'une tâche ou la délégation de cette tâche à un automate. Les participants les plus intelligents ont fait usage de l'automate plus souvent que le reste des participants. Ces résultats plaident en faveur de l'idée que l'intelligence chez les êtres humains serait à considérer comme un avantage évolutionnel qui aurait jadis aidé nos ancêtres à survire. De nos jours, l'intelligence favorise toujours l'utilisation d'outil lorsque cette utilisation se trouve être plus efficace que la réalisation manuelle d'une tâche. Nos résultats expliqueraient également pourquoi les êtres humains conçoivent et utilisent un nombre exponentiel d'outils.

1. Introduction

It is always surprising to observe the variety of strategies and tools that different people may use to achieve a task, even if relatively simple. Inter-individual strategies are a well-known and studied phenomenon often referred as people activity in the psychology and human factors areas (Leplat, 1981, 1990). For decades many psychologists have intended to characterize, understand and measure these cognitive differences between people that result in different behavioral strategies. The present study aimed to explore why some people are more prone than others to use automatic tools based on cognitive differences.

Humans are not unique in using tools. Rather, they are unique because they use frequently a great variety of tools (Osiurak, Jarry, & Le Gall, 2010; Osiurak, 2014). The use of tools has increased exponentially over the centuries (Isaac, 1976). Additionally, tools tend to be more and more complex and autonomous. Some tools can even replace human for several tasks, this tools category hereafter referred as "automatic tools" were investigated in the current study (Navarro, Mars, & Young, 2011). The human proneness to use tools might be explained by human brain capabilities that provided us an evolutional advantage over other species. Major cognitive differences between human and non-human primates were reported after a systematic comparison of major cognitive capacities related to tool use (Vaesen, 2012) and human intelligence has acquired unique characteristics (Matsuzawa, 2001). Compared to grand apes, humans' benefits for instance from better hand-man coordination, a unique causal thought system and representation of functional knowledge, a remarkable inhibitory control and several sophisticated social learning strategies (Vaesen, 2012). Because of its specific cognitive capabilities, humans were able to conceptualize, design and use more and more complex tools (Gibson & Ingold, 1994; Gibson, 2012). Those tools may extend human intelligence contributing even more to the design and use of tools (Salomon, Perkins, & Globerson, 1991). Within this context, it is reasonable to hypothesize that the more intelligent people are the more they should use tools. Intelligence is defined here as the ability to understand, reason, and solve problems within an adaptive perspective (Piaget, 1970). Thus, the focus was set on the dimensions of intelligence directly related to tool use (i.e. perceptual organization and processing speed).

The hypothesis that reasoning or intellectual skills support proneness to use tools has also been recently suggested by the 4 Constraints Theory of human tool use (4CT; Osiurak, 2014). According to 4CT, this proneness can be explained by specific cognitive skills allowing humans to assess the costs and benefits (e.g., in terms of effort of time) associated to different potential tool use or non-tool use options. This approach diverges from the perspective that proneness to use tools is based on "personality factors" such as maximization tendency, boredom avoidance or locus of control (for a review see Osiurak, Wagner, Djerbi, & Navarro, 2013). For instance, decision of using a tool or not might be under the influence of the maximization tendency (Schwartz et al., 2002). The tendency to maximize (i.e. explore all available options to select the best) should result in a more frequent use