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Dissociation between decision-making under risk and decision-making under ambiguity in premanifest and manifest Huntington’s disease

Najia Adjerouda,b, Jeremy Besnardc, Christophe Vernyb, Adriana Prundeanb, Clarisse Schererb, Bénédicte Gohiereb, Dominique Bonneaud, Nicole El Massiouia, Philippe Allainb,c,*

aInstitut des Neurosciences Paris-Saclay (Neuro-PSI), UMR 9197, Université Paris Sud, CNRS, Université Paris Saclay, Orsay, France
bCentre National de Référence pour les Maladies Neurogénétiques de l’Adulte, Département de Neurologie, Centre Hospitalier Universitaire, Angers, France
cLaboratoire de Psychologie des Pays de la Loire(EA4638), Université d’Angers, Angers, France
dDépartement de Biochimie et Génétique et UMR CNRS 6015, INSERM 1083n, Centre Hospitalier Universitaire, Angers, France

*Corresponding author: Philippe ALLAIN, Département de Neurologie, CHU Angers, 4, rue Larrey, 49100 Angers Cedex, France. Tel.: 033241355546; fax: 033241353594. phallain@chu-angers.fr

Abstract

We investigated decision-making under ambiguity (DM-UA) and decision making under risk (DM-UR) in individuals with premanifest and manifest Huntington’s disease (HD). Twenty individuals with premanifest HD and 23 individuals with manifest HD, on one hand, and 39 healthy individuals divided into two control groups, on the other, undertook a modified version of the Iowa Gambling Task (IGT), an adaptation of a DM-UA task, and a modified version of the Game of Dice Task (GDT), an adaptation of a DM-UR task. Participants also filled in a questionnaire of impulsivity and responded to cognitive tests specifically designed to assess executive functions. Compared to controls, individuals with premanifest HD were unimpaired in performing executive tests as well as in decision-making tasks, except for the Stroop task. In contrast, individuals with manifest HD were impaired in both the IGT and executive tasks, but not in the GDT. No sign of impulsivity was observed in individuals with premanifest or manifest HD. Our results suggest that the progression of HD impairs DM-UA without affecting DM-UR, and indicate that decision-making abilities are preserved during the premanifest stage of HD.

Keywords: Decision-making, Huntington’s disease, modified Iowa Gambling Task, modified Game of Dice Task

1. Introduction

Huntington’s disease (HD) is an inherited autosomal dominant neurodegenerative disorder caused by an unstable expansion of the trinucleotide repeat cytosine-adenine-guanine (CAG) in the HTT gene encoding huntingtin. Until recently, it was thought that the striatum
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