

# Does disbelief in Free Will promotes risk-taking decisions ? A study combining belief induction and Iowa Gambling Task

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## INTRODUCTION

- Previous studies on free will showed that people tend to behave less responsibly when induced with determinist as compared to free will beliefs [1,2].

-We investigated whether comparable behavioural biases can be observed when individuals can choose between safe and risky choices as assessed in the Iowa Gambling Task (IGT) [3,4].

-*Hypothesis: individuals who have been induced with a deterministic belief take more risky decisions than those who have been induced with a free will belief*

## METHODS AND PROCEDURES

### Subjects

143 UNIL students (females=119 ; mean age : 20.96, sd=3.331 ; 18-38 range). Due to semester restrictions, 46 subjects were passed during the first semester, the 97 others during the next semester.

### Incentives

To guarantee that individuals are motivated in the IGT [5], we informed them in advance that the three best performing subjects would receive a prize voucher.

### Protocol

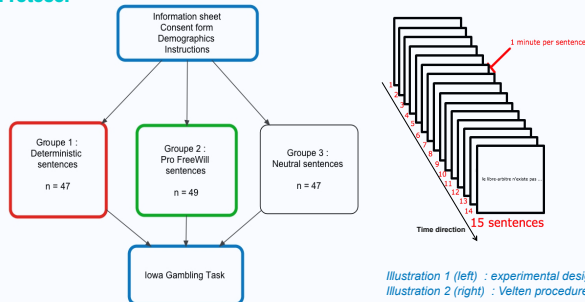


Illustration 1 (left) : experimental design  
 Illustration 2 (right) : Velten procedure

### Belief Induction

The inducing procedure was a Velten like procedure (illustration 2) of 15 sentences appearing on the computer screen for 60 seconds each [2]. This procedure was added to the IGT PEBL code (see next section) to appear before the IGT.

Participants were told that they could be questioned on the sentences at the end of the experiment and should read them carefully.

#### Deterministic condition sentence example :

- Science has demonstrated that free will is an illusion.
- Everything a person does is a direct consequence of their environment and genetic makeup.

#### Pro Free Will condition :

- I demonstrate my free will everyday when I make decisions.
- Our actions and thoughts are not simply the result of prior experiences.

#### Neutral condition :

- The Olympics are held every four years.
- Sugar cane and sugar beets are grown in 112 countries.

### Iowa Gambling Task

We used the classical IGT [3,4] available in the PEBL freeware [6]. They had to try to get the highest score possible by choosing (100 tries) one of the 4 card deck and that depending on the deck, they will gain and lose different amounts of virtual money.

- Two of the decks are considered as low risk (low gain / very low loss) and two as high risk (high gain / very high loss).
- Non clinical population is supposed to learn to avoid the risky decks over time [3,4].

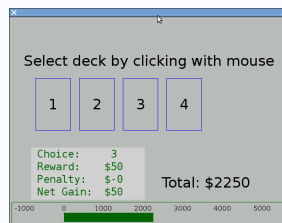
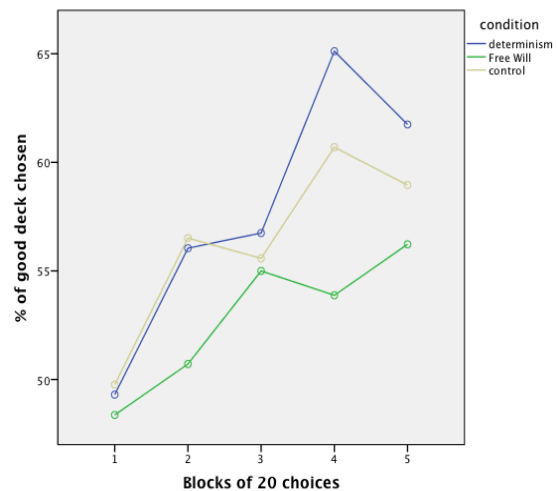


Illustration 3 : Screenshot of Iowa Gambling task on PEBL  
 (Source: <http://pebl.sourceforge.net/battery.html>)

## RESULTS

Comparable to the previous literature [3,4], we analysed participants choices over 5 consecutive blocks of 20 choices each.

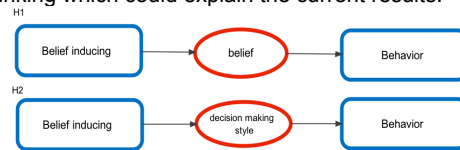
These values were subjected to a repeated measures ANOVA with block as repeated measure and induction condition as between-subject measure. Results showed a main effect of the condition,  $F(2,132)=3.471, p=0.034$ .



## DISCUSSION

• Contrary to our expectation, individuals in the deterministic condition were more efficient in learning to avoid the risky decks when compared to individuals in the neutral and free will condition.

• We propose that a deterministic perspective might promote emotional decision making rather than rational thinking which could explain the current results.



### Additional study

4 groups were subliminally primed with, respectively, Voting, Freedom, Prison, Constraint ; then subjects answered the 3 questions from Cognitive Reflection Test [7].

A Kruskal Wallis test showed that people primed with Voting had a significantly higher CRT score than the 3 other conditions,  $H=8.191, df=3, n=75, p=.042$ . No effect of priming on any free will belief related questionnaire was found.

These results seem to confirm a link between Free Will related priming and decision making style as people primed with a Freedom related word (Voting) demonstrated a tendency to use a Reflexive thinking style rather than an Intuitive one. Next study will investigate further the effects of subliminal priming of semantically similar words.

## References

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