



# USING DESIGN THINKING WORKSHOPS TO RESOLVE DIALECTIC TENSIONS IN DISRUPTIVE INNOVATION TEACHING

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Mentoring: Pr André Tricot

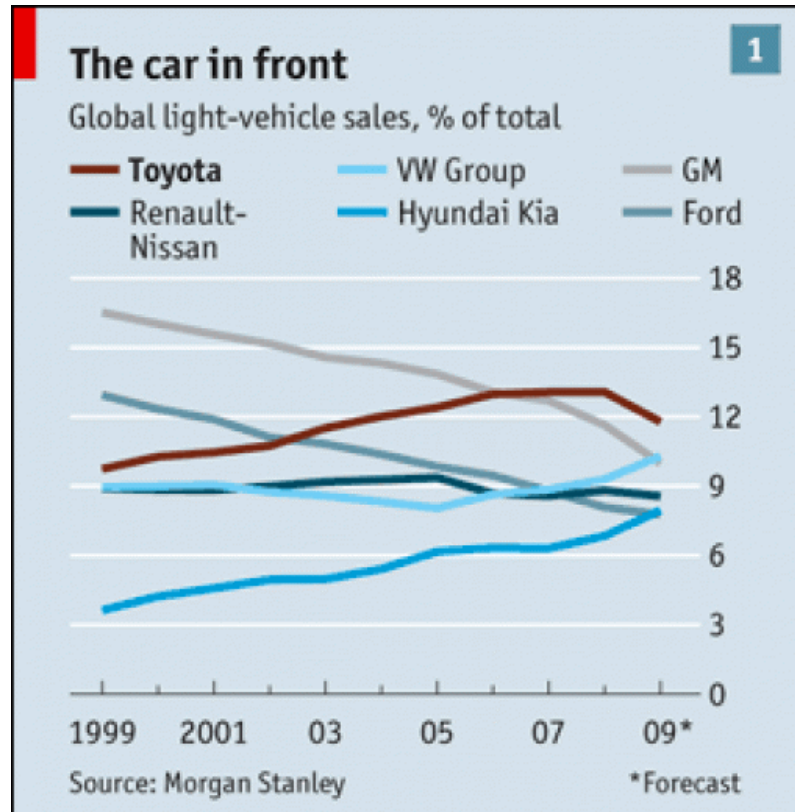
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Toulouse University, France, Europe



Environment

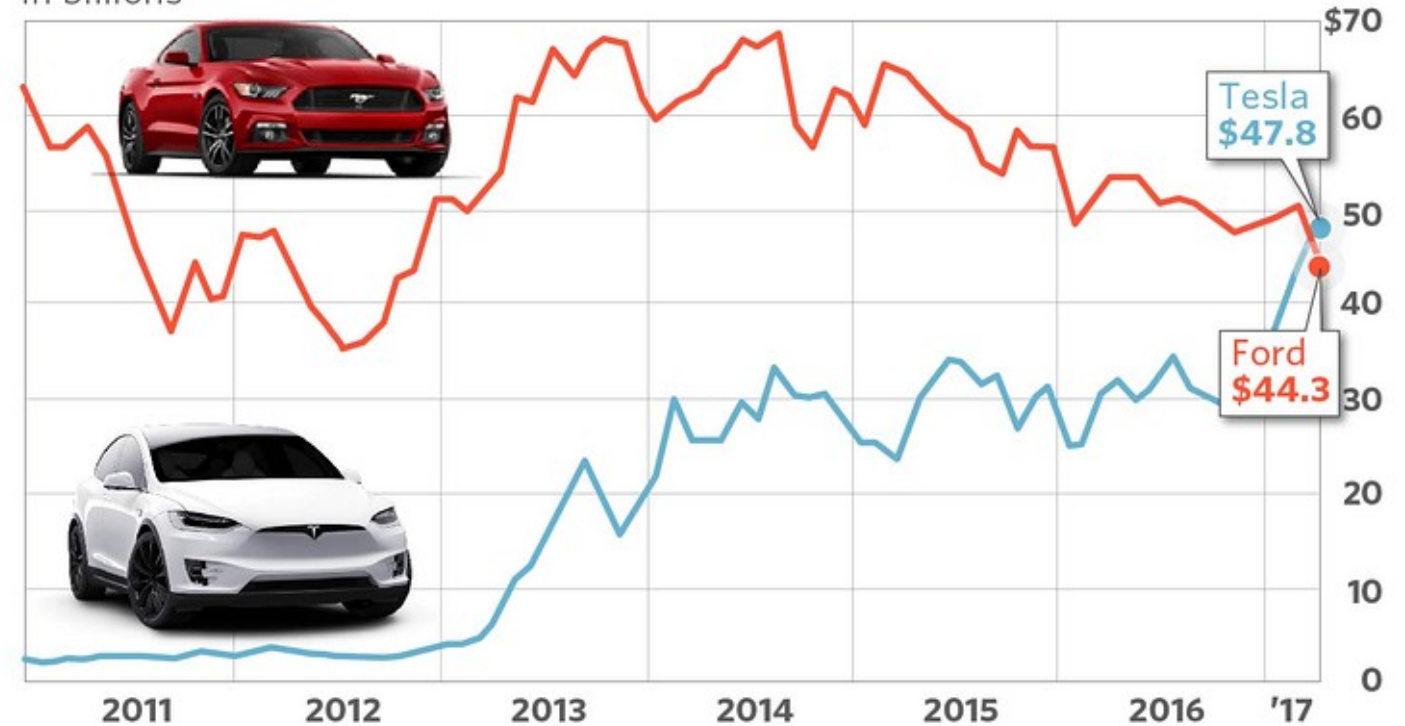
# Evolution



# Disruption

## Tesla's market cap overtakes Ford's

In billions



Source: FactSet

# Disruptive Innovation

Form of innovation:

- Targeting a **good enough** quality
- **Quick** Time To Market
- Focusing first on a **niche underserved market**
- Product evolution is **iterative**, with short cycles
- Product is improving quality, adding features and ends up **targeting a larger market**
- Often associated with the **Schumpeterian creative destruction**





# Adaptation Strategies

Clayton Christensen, renowned advocate of disruptive innovation, calls disruptive innovation a gift that can only be “marginally learned”.

Companies are invited to adapt via the following three means:

- employee selection, based on compatible profiles
- taylorization of innovation tasks
- acquisition of disruptive teams/companies

*Determinist paradigm, relying on selection, taylorization*

# Taylorism and determinism in the Silicon Valley



## Designer

*Hipsteri Artus*

Designers show the most variation of all the species on display in this exhibit. This includes their range of plumage and coat colors: they can blend in with the blandest of middle managers, or outsparkle the sparkliest of the UX Researchers. In addition, they have the widest range of working hours, more nocturnal than a software engineer, or can arrive earlier than the most sane content strategist.

This protean shape-shifting ability allows designers to insinuate themselves into nearly every aspect of the company's culture and operations.

## UX Researcher

*Listenus Userii "Quantii"*

*Listenus Userii "Qualii"*

UX Researchers are dry, dour, humorless beasts that lumber across the landscape, laying waste to otherwise good ideas. There are two major sub-species, the "Qualii," who are known for being able to communicate in complete, empathetic sentences, and the "Quantii" who, at a distance, are often confused with Data Scientists. They often inter-breed, producing a "mixed method" offspring.

UX Researchers are often found in their user's natural habitat, including street intercepts, cafes, and remote research facilities.

## Native Range

## Software Engineer

*Nerdious Geekius*

The elusive Software Engineer is a nocturnal creature, rarely found at their desks before 10 or 11 in the morning, but often staying late into the night. They dislike being interrupted while at work, and it theorized that their penchant for twilight hours is an evolutionary adaptation to reduce breaks in their trance-like state of coding.

Not surprisingly, Software Engineers are solitary creatures, except for occasional gatherings called "code reviews." In these gatherings, engineers gently pace around a clearing, sizing up each other's work. Although occasional battles will erupt, they mostly end without injury and the engineer will retreat to their desk and continue to hibernate.

## Data Scientist

*Selectus Whereus*

Fleet-footed and fast, Data Scientists will dog their prey for days to weeks, waiting for the perfect moment to bring them down. Data Scientists are born in the middle of the winter, deaf, hairless and blind. After nursing for remainder of the winter, they emerge into the fresh spring and almost immediately begin writing complete SQL queries.

Their acute sense of smell and hearing mean that they often detect threats far before other animals do. They have a symbiotic relationship with the slow and vulnerable UX Researcher, alerting the Researcher of possible predators.

**Diet:** The most common diet is a mix of microkitchen and street food.

**Conservation Status:** Endangered

**Fun Fact:** They are often found in their user's natural habitat, including street intercepts, cafes, and remote research facilities.

## Content Strategist

*Perfecti Phrasi*

Meek and unassuming, Content Strategists hunt in packs of 2-3, where their cutting wit and sharp tongues can kill quickly (although with surprising amounts of blood). Alone among the species found in this enclosure, they maintain a regular schedule, arriving shortly after breakfast, and leaving in the late afternoon.

Often times neglected as "that other team-mate," Content Strategists form an important part of the MPK23 ecosystem, culling the old and making room for the new.

## Native Range



**Diet:** Dictionaries, Thesauruses

**Conservation Status:** Threatened, due to habitat loss and overhunting.

Content strategists will develop with symptoms when separated from the wild.

## Native Range



**Diet:** Pizza, caffeinated Beverages, Potato chips

**Conservation Status:** Endangered due to poaching and head hunting.

**Fun Fact:** Software Engineers have been known to kill each other in brutal fights over identification styles.

## Native Range



**Diet:** Anything that can be put in a table, but drink daiquiris like none other.

**Conservation Status:** Endangered

**Fun Fact:** Owing to their obsession with sample size, they own no travel size products



# Other adaptation strategies

Develop your own innovation capacity by organizing Design Thinking workshops:

- “We believe **everyone** has the capacity to be creative.”  
d-school @ Stanford introduction message
- **human** centered group experience
- **training** experience in **productive** environments
- well described phases: empathy, definition, ideation, prototyping, experimentation

***Socio-constructivist paradigm, relying on training***

# Influence of the environment on Design Thinking implementation

Socio-Constructivism



Life long learning

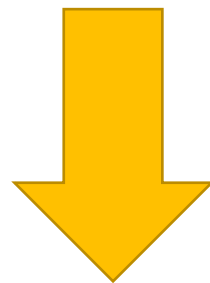


Design Thinking

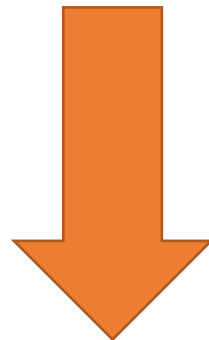


**Design Thinking Workshops  
in the tech industry  
for disruptive innovation**

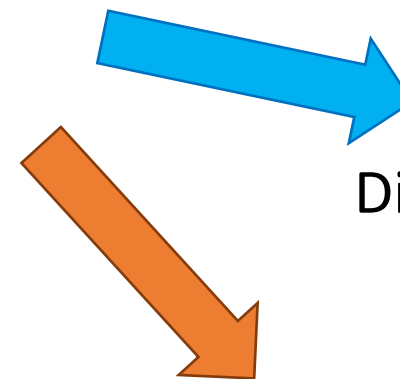
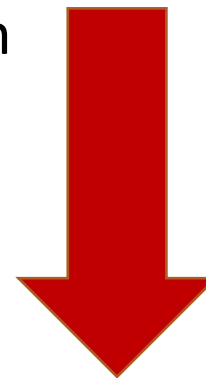
Taylorism



Determinism



Disruptive  
Profiling Innovation  
Determinism



Profile  
Diversification

Profile  
Reinforcement

# Question

Considering the quality of the disruptive project during Design Thinking Workshops  
is it more efficient to:

- invite participants to **diversify** their profile(s)?
- **taylorize** the workshop, based on their specialty?

In both cases, we'll rely on psychology profiles.

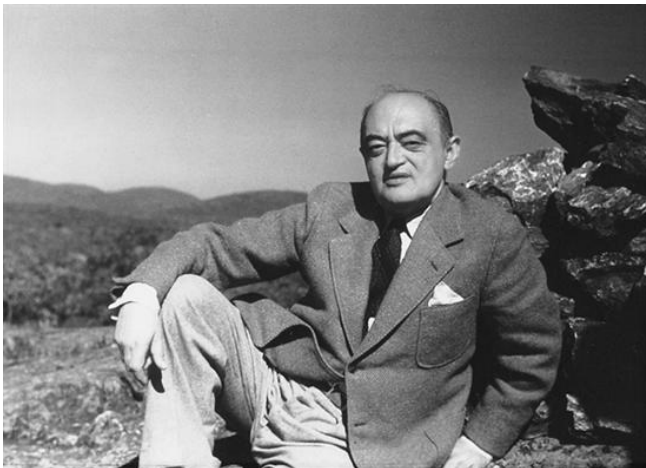
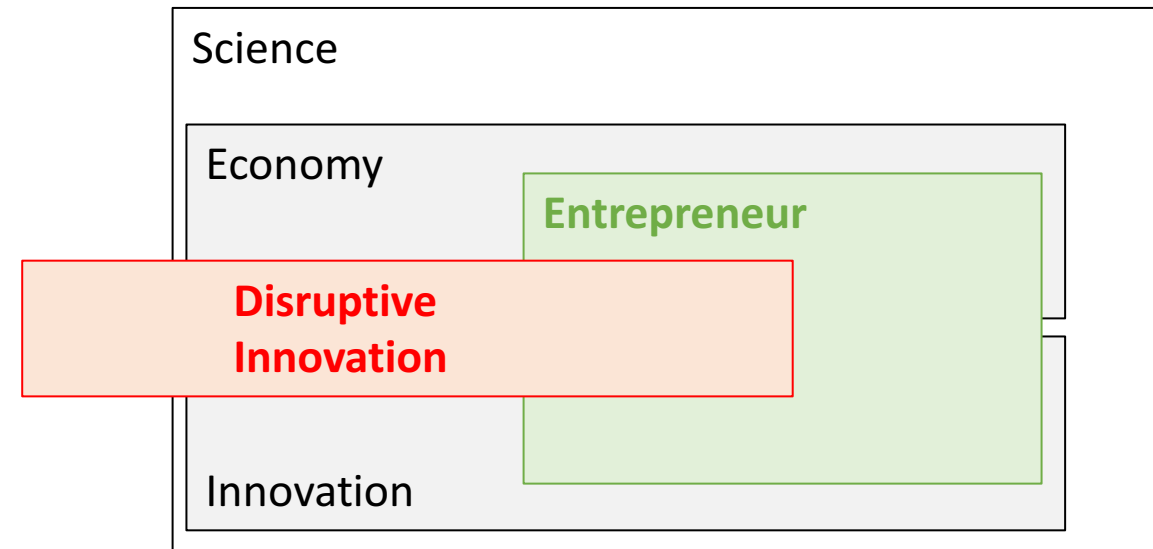
State of Knowledge

# Disruptive Innovation

One of the forms of innovation:

- applied to a market
- with certain specific characteristics

Contested definition between **Christensen** and other sources.



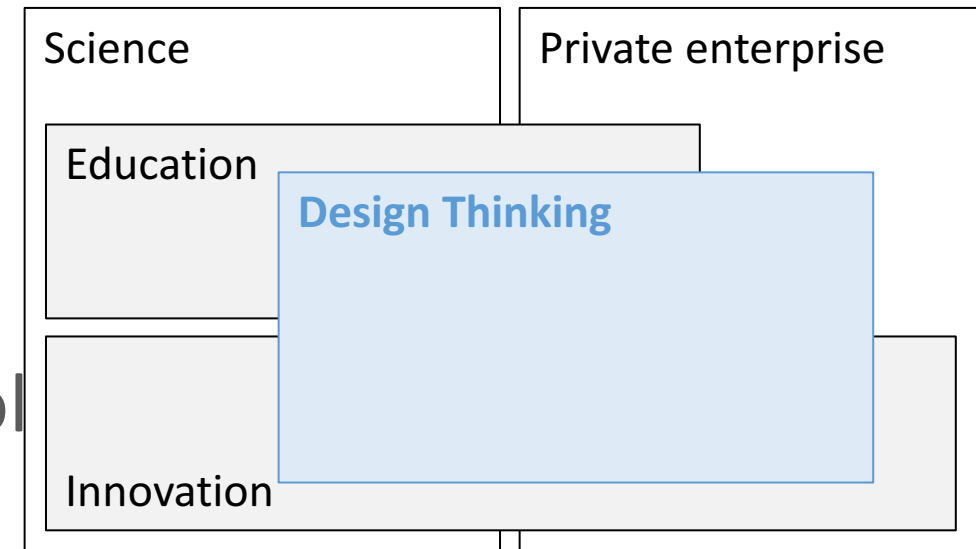
Often linked to the concept of **Schumpeterian creative destruction**, or more broadly, the radical evolution of markets.



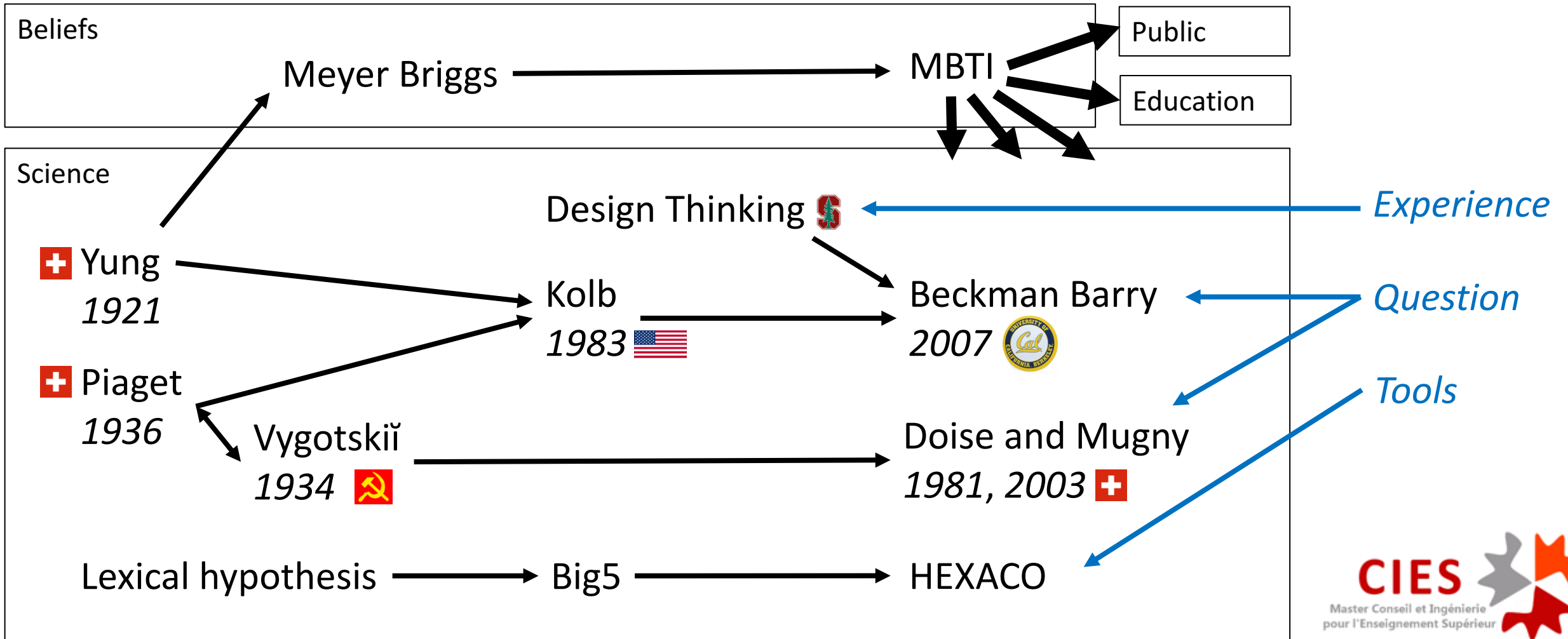
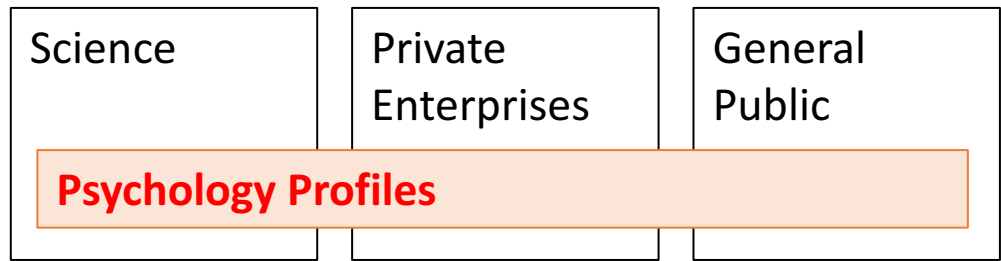
# Design Thinking

Strongly linked to the Stanford d-school

- Solid academic basis
- Coherent operationalization by IDEO/Tim Brown
- High variability in implementation strategies in companies

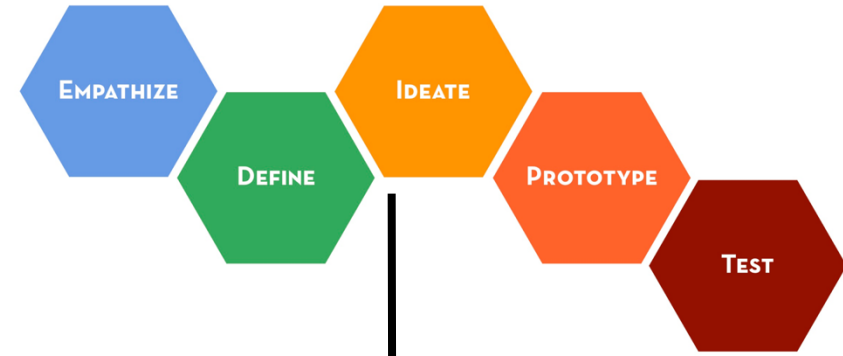
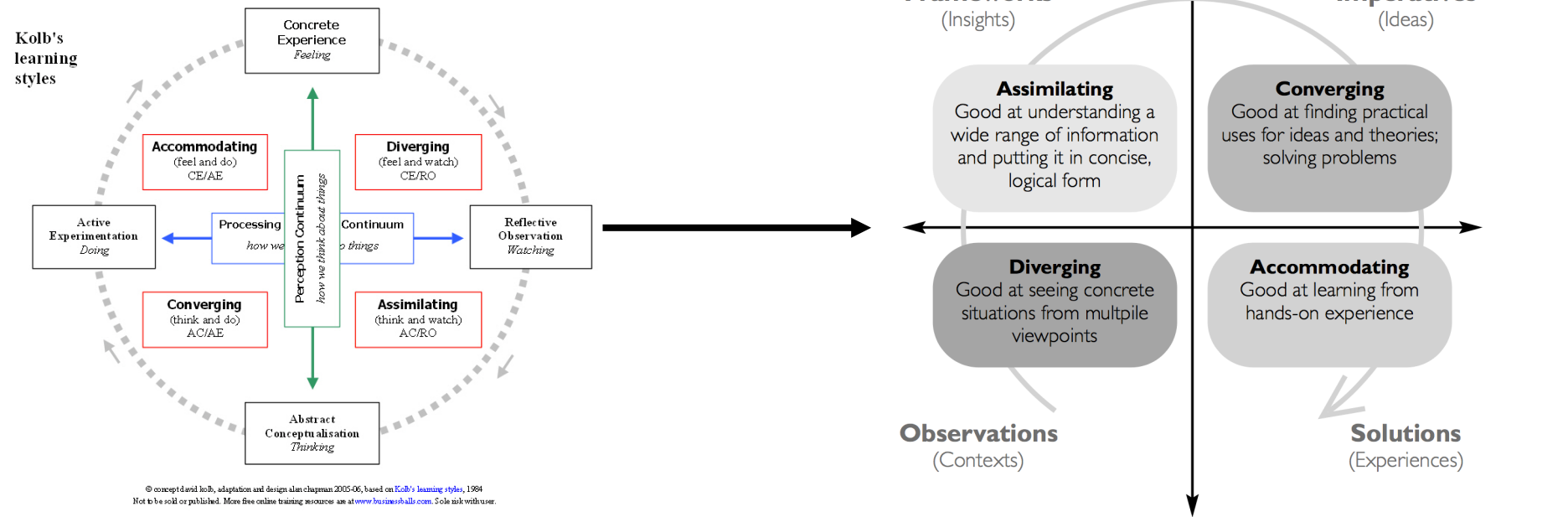


# Psychology Profiles in education



# Profiles and Design Thinking

## *Beckman and Barry 2007*



# Profiles and Design Thinking

## *Beckman Barry 2007*

Proposes an alignment between:

- Phases of an innovation method
- Methods of group work
- Psychology profile of a person
- and indirectly, a model of psychological maturation

*Conflict of scale (individual / group)  
and time (project / life)*

Science

Management

Psychology

Psychology of Education

Innovation

Beckman 2007

**BerkeleyHaas**  
Haas School of Business  
University of California Berkeley



# Dialectic Tensions



Design Thinking is causing **dialectic tensions** between different psychological profiles, forms of expression and working methods. Innovation is generated when tensions are resolved.

- **Constructivism** outlook: Piaget. Child is born with potential. Group work is creating tension, revealing his potential. Adults do not evolve any more, or very little.
- **Socio-Constructivism** outlook: Vygotskiï, Doise and Mugny. Group work creates tensions. By finding solutions incorporating inputs from all members, tensions are resolved together. Then the group knowledge is integrated by members and the group can handle more complex problems.

# Management of Dialectic Tensions during Design Thinking Workshops

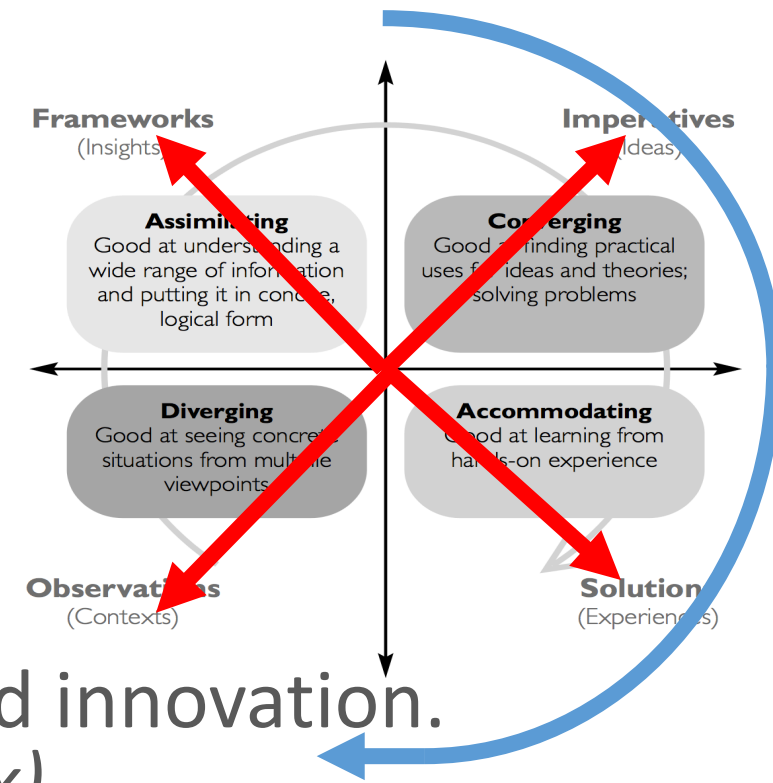
When the tech industry is trying to introduce disruptive innovation with Design Thinking workshops, two notable strategies are observed:

- **Simple constructivist** outlook, determinism and taylorism: recruit different profiles, reinforce them, taylorize innovation tasks. Innovation is a product of the group's work, thanks to the manager's active organization. A group is a sum of individuals.
- **Socio-constructivist** outlook: recruit different personalities, invite them to diversify their profiles by preventing taylorization. Innovation is the product of a self regulating group working autonomously and learning as a entity.

# Profile Evolution: Centrifuge / Circular

Our innovation profile can evolve in two different ways:

- **Centrifuge**: improve one or several profiles.  
Simple-constructivist outlook on profiles and innovation.  
*ex: as measured by LSI (Learning Score Index)*
- **Circular**: improve the capacity to move from one profile to the other during innovation, especially in teams.  
Socio-constructivist outlook,  
works with dialectic tension concepts.  
*ex: as measured by LSP (Learning Skills Profile)*





Study

# Two modalities

We're comparing two modalities of team work during Design Thinking workshops:

- **Determinist** outlook: profile reinforcement, taylorization
- **Socio-constructivist** outlook: diversification, autonomy

What is kept identical:

- Initial psychology profile established by HEXACO
- Professional environment, productivity, expectations

# Two successive modalities

- The two modalities will be applied successively for all participants
- The two possible successions will be tested by splitting the participants into two sub groups
- Participants are unaware of the operating mode during the 1<sup>st</sup> modality
- We'll proceed to a third phase of joint group reflexive work
- Evaluations:
  - HEXACO test
  - Initial evaluation
  - After 1<sup>st</sup> modality
  - After 2<sup>nd</sup> modality
  - After reflexive work

# Psychological profiles

- HEXACO Test in french
- Team formation: diversified
- For the determinism-reinforcing modality:
  - Determinism: result from the HEXACO test is to be understood as a detection of your inner pre-existing specialty
  - Reinforcing: invitation to reinforce your specialty
  - Teams: each specialist is in charge of a Design Thinking phase fitting his detected specialty
- For the diversification modality:
  - Constructivism: result from the HEXACO test is to be understood as an opportunity to reflect on our biases and anticipate your behavior during work group
  - Diversification: invitation to actively diversify
  - Teams: invitation to be proactive during the less comfortable phases, and help the others during your comfortable phases

# Evaluations

- HEXACO Profiles
- Form to fill by each participant:
  - Evolution of the knowledge on innovation
  - Evolution of the will to innovate
  - Evolution of the opinion on determinism and work group
  - Opinion on the workshop
- Form to be filled by each team:
  - Projects description and evaluation

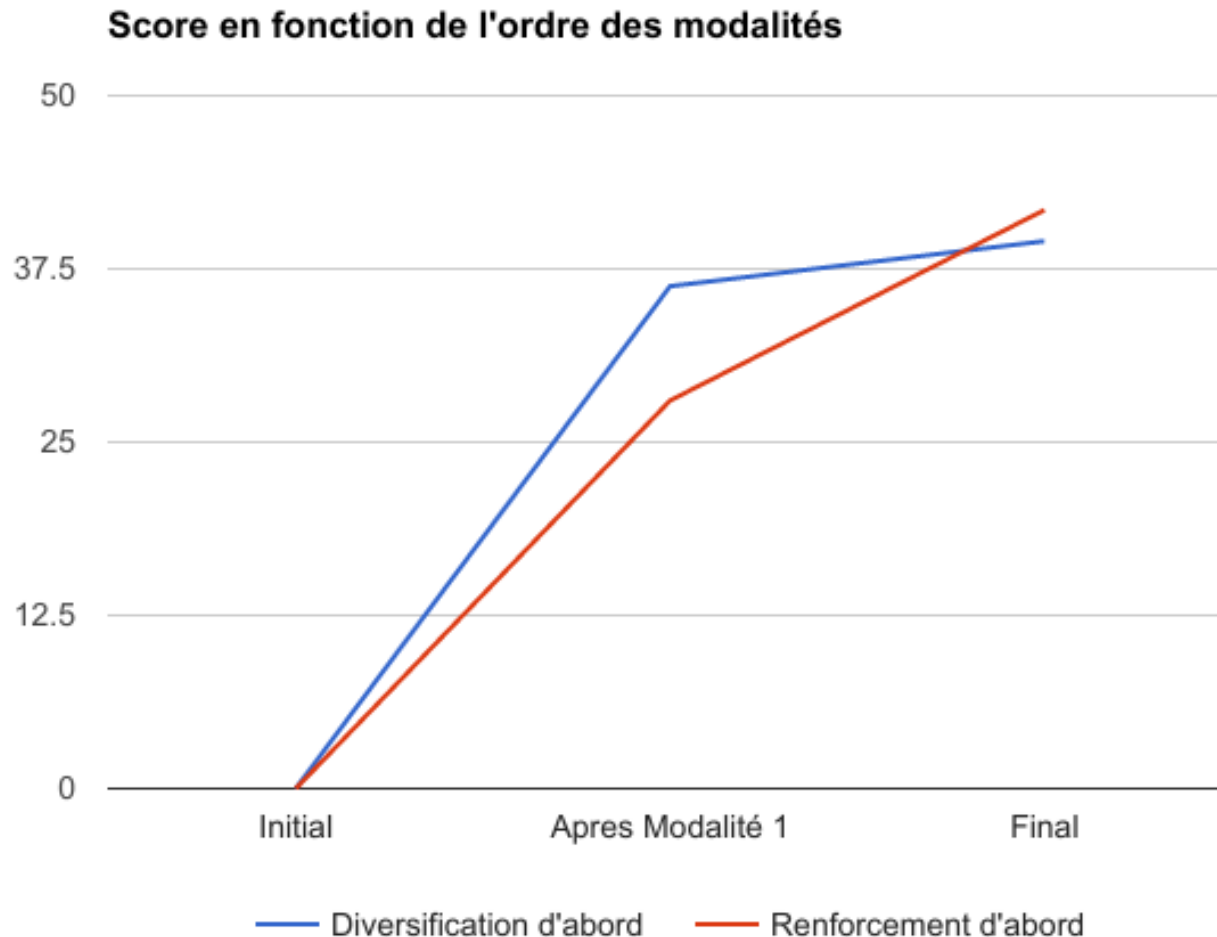
# Results

# Presentation

- Test initial deployment at INSA Toulouse (engineering school)
- Final deployment organized at a tech industry R&D site
  - 36 attendees (5 women)
  - 8 teams (in 2 groups of 4 teams)



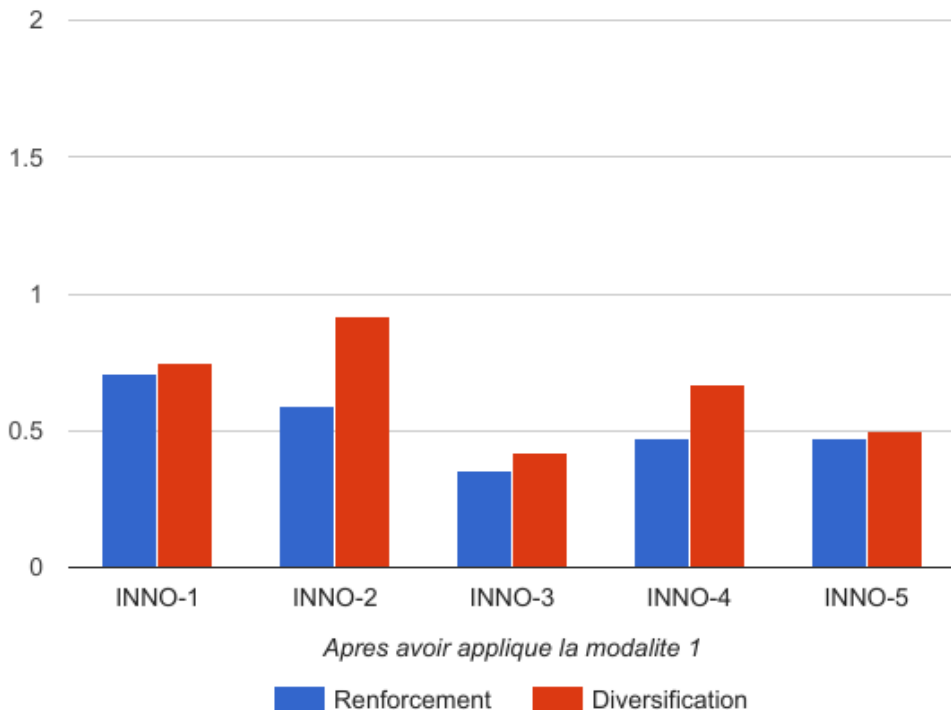
# Effect of modality on project quality, as measured by innovation and disruption criteria



- The diversification modality is leading to more innovative projects than the reinforcement modality (+29.5%,  $p=0.0016$ , test T)
- Experimenting the diversification modality after the reinforcement modality is still beneficial

# Evolution of knowledge

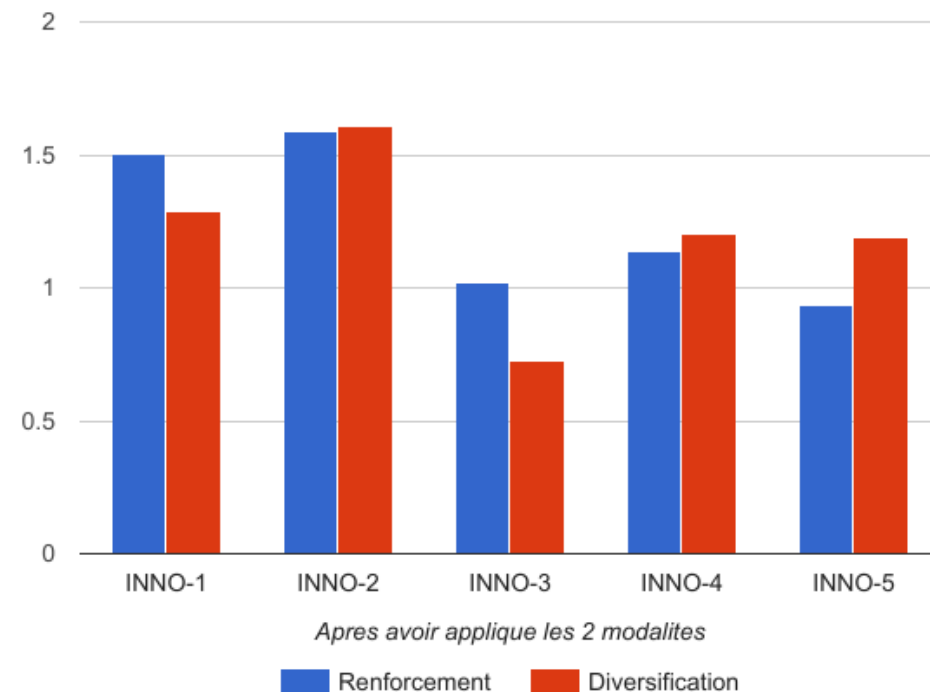
Evolution des connaissances sur l'innovation



Diversification leads to a **better understanding of innovation**, self-declared (+25%)

1. I'm confident in my ability to innovate
2. I know how to better work in groups
3. I'm more at ease with contradictions at work
4. I'll know how to get my innovation work accepted at work
5. I know more about my thinking and work behavior

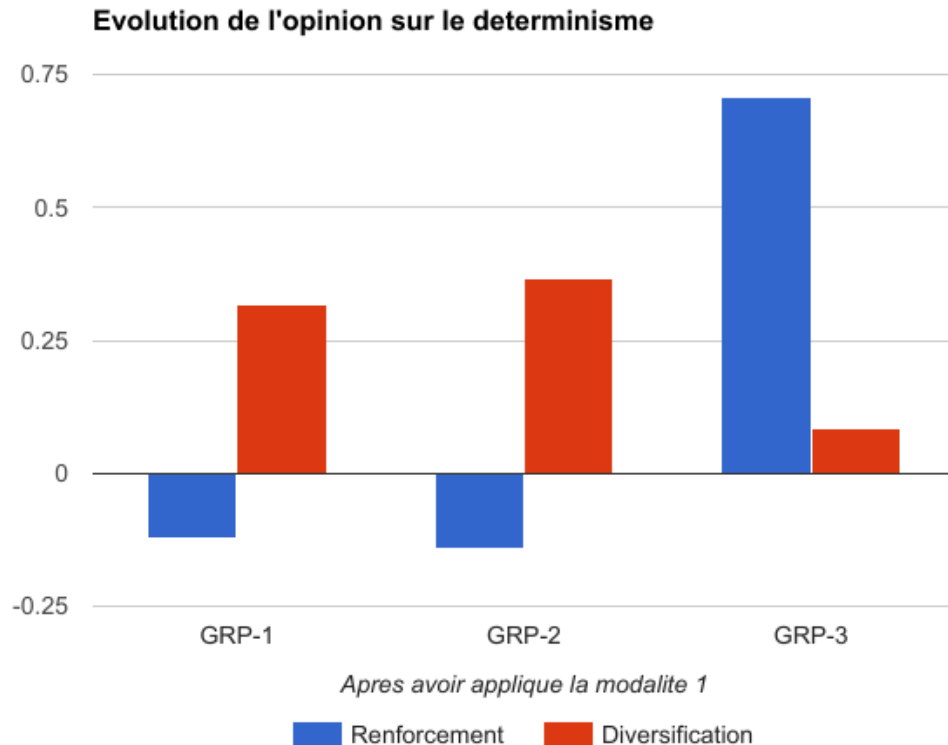
Evolution des connaissances sur l'innovation



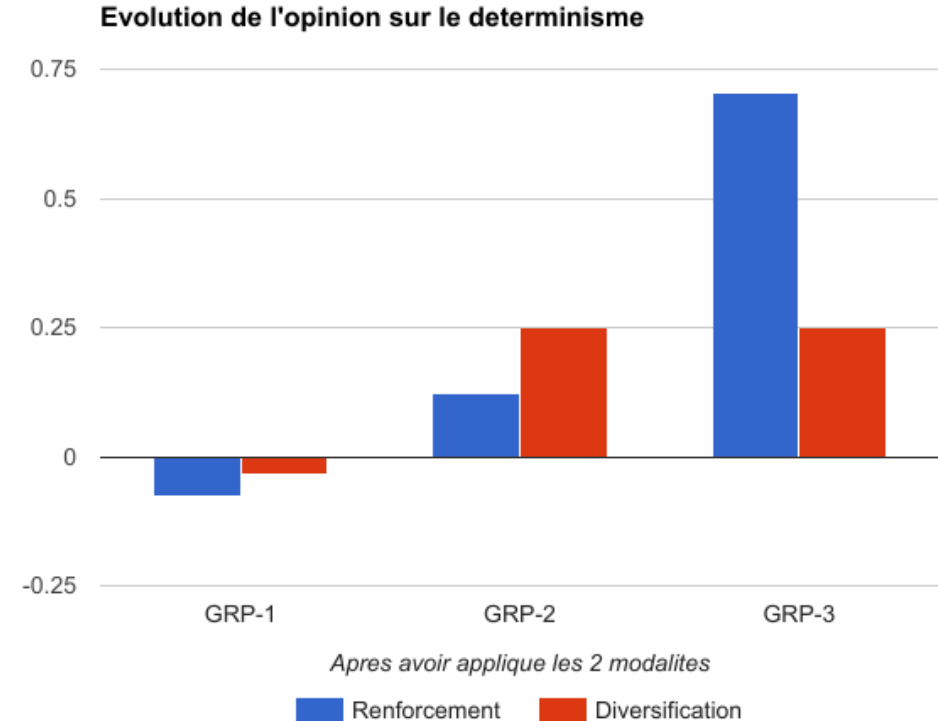
The workshop format with **two modalities** is improving all scores.

# Opinion on determinism

1. *I think we all have one dominant profile (-2) or different profiles depending on the context (+2).*
2. *It's the manager's task to assign roles (-2) or the team should self-regulate (+2)*
3. *In teams, it's better to each have different roles (-2/+2)*



Both modalities tend to reinforce the outlook presupposed by the the modality.



But the succession of 2 modalities is leading to an average opinion.  
*Note: error for GRP-3*

# Opinions after reflexive group work

1. *I find my HEXACO test results interesting*
2. *Using my dominant profile is easier*
3. *Diversifying helps working with others*
4. *I think a person can have multiple profiles*
5. *I think dominant profile(s) can evolve*
6. *I think training can help us develop our profiles*
7. *In the future I'd like to reinforce my dominant profile (SP) or diversify as much as possible (DI)?*

Echantillon et modalités	Questions finales sur les profils						
	F-PRO-1	F-PRO-2	F-PRO-3	F-PRO-4	F-PRO-5	F-PRO-6	F-PRO-7
Echantillon	3.76	3.13	4.23	4.3	3.83	3.8	3.7

**TABLE 8 RESULTATS DES QUESTIONS FINALES SUR LES PROFILS**

- Participants accept the result of their HEXACO test (PRO-1)
- The notion of profile(s) evolution is highly supported. (3.83 for PRO-5)

# Opinions after reflexive group work

Echantillon et modalités	Questions finales sur le DT et l'atelier						
	F-QUE-1	F-QUE-2	F-QUE-3	F-FIN-1	F-FIN-2	F-FIN-3	F-FIN-4
Echantillon	3.8	2.97	2.9	4.17	3.87	4.03	4

TABLE 9 RESULTATS DES QUESTIONS FINALES SUR LE DT ET L'ATELIER

- In the future, would you like to work with a team asking you to use your dominant profile and specialize (-2) or is supporting you in your diversification (+2)?*
- If we consider the short term project interest, what is the best?*
- If you had to organize a very innovative team, would you rather choose:*
  - identical profiles? (1)*
  - different profile + specialization? (2)*
  - different profiles + diversification? (3)*
- I want to innovate more in my future job*
- I am better informed about innovation management*
- This workshop is leading me to reflect on my innovation team behavior in the future, even a little*
- I would recommend this workshop*

- Strong preference to be part of teams supporting their diversification (3.8 for QUE-1)
- Strong divergence between the personal preference for diversification and the perceived project's best interest (3.8 for QUE-1 against 2.96 for QUE-2)
- Strong divergence between the short term project best interest (QUE-2) and the long term innovative team forming strategy (QUE-3)

# Results by profile

1. *Altruists tend to put the group's interest first (real of perceived interest) (PRO-2, QUE-2)*
2. *Profiles open to experience accept their test results and are more likely to change their behavior. (PRO-1, FIN-1)*
3. *Conscientiousness profile: more likely to accept complex concepts. (QUE-4)*
4. *Extraversion Profiles: strong correlation with accepting, preference for diversification, positive opinion about the workshop.*
5. *Emotive: unhappy.*

Dimensions HEXACO	Questions finales													
	PRO-1	PRO-2	PRO-3	PRO-4	PRO-5	PRO-6	PRO-7	QUE-1	QUE-2	QUE-3	FIN-1	FIN-2	FIN-3	FIN-4
H	0.19	-0.44	0.09	0.31	0.23	0	0	-0.07	0.22	0.14	0.44	0.09	0.26	0.02
E	-0.33	-0.33	0.06	0.06	0.05	-0.16	0.27	0.28	-0.21	-0.25	0.06	-0.08	-0.01	-0.14
X	0.51	0.1	0.42	-0.07	0.29	0.45	-0.21	-0.21	-0.01	0.1	-0.07	0.49	0.17	0.4
A	0.26	0.2	0.12	0.16	0.23	0.23	0.07	0.02	0.18	0.31	0.02	-0.12	0.11	-0.06
C	0.1	-0.02	0.18	0.41	0.06	-0.02	0.16	0.13	-0.15	0.03	0.21	0.13	0.28	0.05
O	0.48	0.11	0.08	0.17	0.03	0.13	0.03	-0.17	-0.1	0.03	0.42	0.02	0.16	0.21
ALT	-0.04	-0.06	0.41	-0.18	0.32	0	-0.07	-0.06	0.4	0.08	0.19	0.39	0.33	0.14

TABLE 10 CORRELATIONS ENTRE DIMENSIONS HEXACO ET RESULTATS AUX QUESTIONS FINALES

Despite multiple warnings about predisposition to behaviors during the workshops, we note:

- The expected behavior for each profile is observed
- Recruiting the right mix of profiles is important for the success of the workshop
- Organizers will need to adopt inclusive practices for the emotive profiles

# Conclusions



# Conclusions

- **Prerequisites:** The experiment and evaluation **worked as expected**, with the exception of 1 poorly formulated question and 1 wrongly presented scale
- **Learning experience:** The 2 days Design Thinking Workshop with two modalities to experience and a strong reflexive component was evaluated as **useful to train and motivate teams** on disruptive innovation and team work.
- **Productive environment:** The **workshop created innovative and disruptive ideas** for this R&D center to present to the parent company in a tense environment.
- **Modalities: Diversification is better than reinforcement** for the following criteria:
  - Better project quality
  - Better understanding of disruptive innovation

# Actions proposed

- **Enterprises:** Design Thinking workshops are a viable way to **train your teams** on disruptive innovation and motivate them.  
During the workshop, assembling teams of diversified HEXACO profiles and **encouraging participants to diversify** is the most efficient and productive method.  
In innovation management, specifically disruptive innovation, **taylorization and determinism are not efficient.**
- **Teaching:** Innovation is a high level social activity. To prepare your students to the knowledge and innovation society, it is best for them to **learn to use different learning profiles** and actively **interact with other profiles.**

# Thanks!

**To my memoir mentor:** Pr André Tricot, CNRS, EPHE & Université de Toulouse 2

<http://andre.tricot.pagesperso-orange.fr/>

**To my presentation jury and Master coordinators:** Isabelle Chênerie and André Tricot.

**To the teaching team of the Master CIES,** for accepting an adult from the private sector with no psychology background to follow the master and for their endless patience during the year. I learnt a lot. Plus of course Marie Brocqua for the continuous help and organization.

**To my fellow students.** It was a pleasure studying with you.

# What next?

**My main activity:** Autonomous Drone Solutions Architect

**On top of this activity, I am now:**

- **Lecturer:** I created and am presenting the “Innovation and Entrepreneurship” module for the new Internet of Things course at Toulouse University-IUT, France.
- **Pedagogical Consultant for Higher Education:** I am always trying to improve the pedagogy of learning activities for adults and higher-education.

A lot of what we do everyday is in fact learning, so let's make it as efficient as possible!

**I'm open to:**

- Lecturing positions, anywhere in the world (I'm based in San Francisco and Paris).
- Joint research on innovation.
- Receiving opinions and new leads on innovation and pedagogy. I'm learning everyday.

**Contact:** [paul@guermonprez.eu](mailto:paul@guermonprez.eu)



# Thanks

