

# **Leadership and Adult Development**

## **Towards a Unified Neuropsychoeconomic Approach**

**Presentation at the ESRAD Symposium May 31- June 2 2013,  
University of Freiburg; Germany**

# Agenda

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- 1 **Introduction: Some words on Neuropsychoeconomics**
- 2 **Theoretical Foundation and Definition of Leadership**
- 3 **Previous Studies 1 & 2**
- 4 **Current Study:  
5 Hypotheses as Exploration of a Unified Approach**
- 5 **General Discussion & Conclusion**

# Broad Definition of Neuropsychoeconomics

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“Neuropsychoeconomics describe the human behaviour and experience in economic context with methodological support of neurosciences.”  
(Camerer, et al., 2005, p. 9).

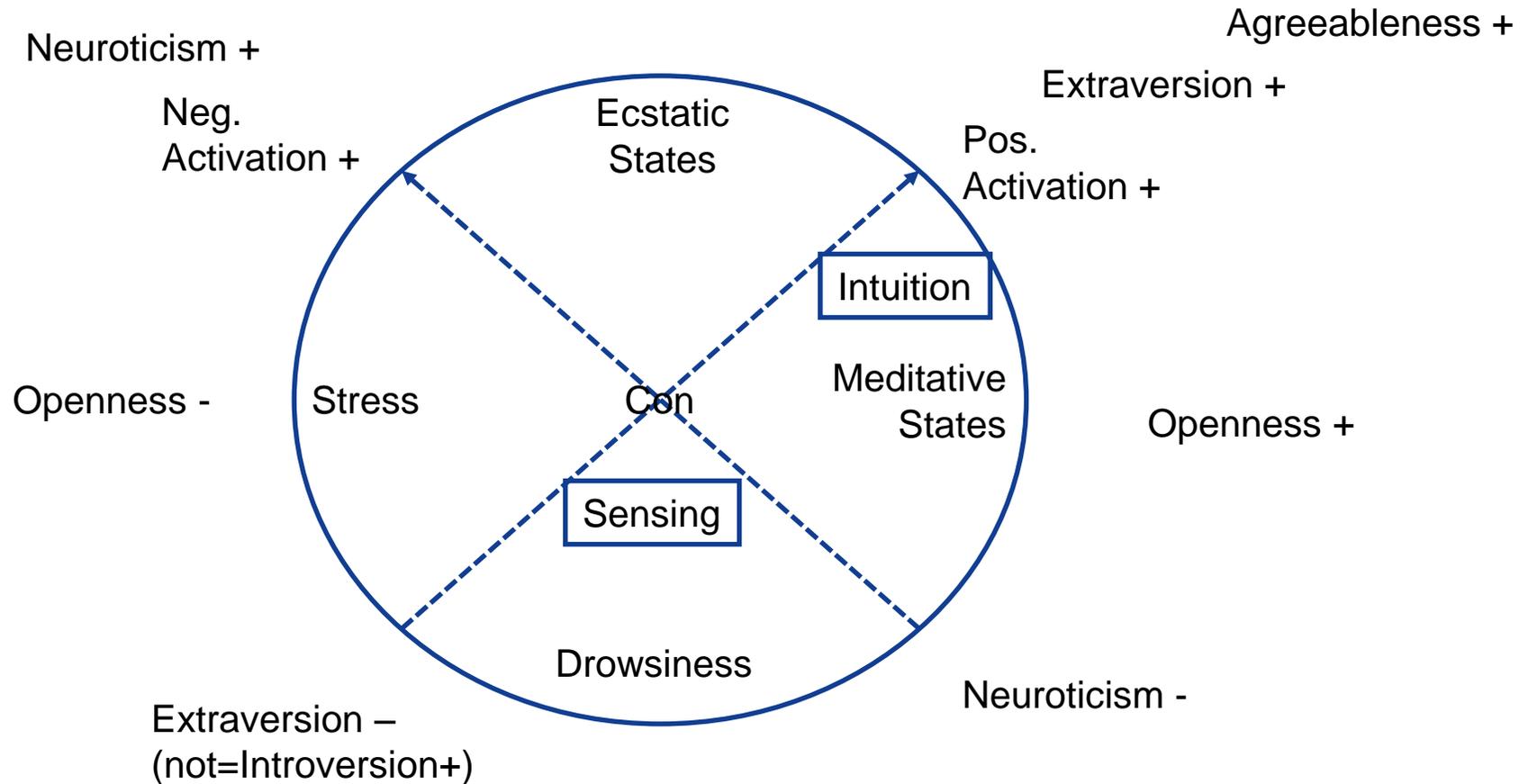
- theoretical input from psychology, sociology and economic sciences.
- biopsychosocial paradigm bringing together social sciences and natural sciences, while structural sciences constitute the link (Küppers, 2000).

# Neuropsychoeconomic definition of leadership

„Leadership can thus from an integrated multi-perspectival view be broadly defined as a specific personality, socially and neurologically-caused targeted action initiation under pressure to decide, which is at the same time retroactive for these spheres.” (Lucas, 2012).

- life- and work-conditions of leaders generally are characterized by higher complexity especially in the field of decision making.  
(Beer, 1995; Jacques, 1998)
- leaders generally show centers of gravity in later adult developmental levels also.  
(Smith, 1980; Merron, 1985; Quinn & Torbert, 1987; Corbett, 1995; Rooke & Torbert, 1998; Cooper, 2005; Brown, 2012)

# Circumplex of Emotions and Personality Traits



(Fischer, 1971; Furnham, 1996; Gurtman, 1997; Plutchik, 1997; Watson & Tellegen, 1999)

# Bounded Rationality and Dual Processes

## Bounded Rationality:

Individuals do not decide on a purely rational basis and “the homo economicus lacks an emotional basis” (Peters & Ghadiri, 2011, p.11).

## Dual Process Theories:

Humans make decisions on basis of two basically different but potentially concurrent processing systems in the brain. In his System I (in subcortical-emotional processes, the region of the dorsal striatum is involved), the arriving information is rapidly and intuitively processed. System II (cortical-cognitive, rational) assesses information extensively and in a balanced way in order to finally arrive at an adequate decision. (Kahneman, 2003).

# Levels of Existence with Corresponding Leadership Values

Level of Existence	Basic Leadership Values
A-N (beige)	Reactive Values: Survival; Staying alive through innate sensory equipment.
B-O (purple)	Traditionalistic Values: Belonging to blood relationships, Safety, Assurance
C-P (red)	Exploitive Values: Enforcing power over self, others, and nature through exploitive dependence, Egocentrism
D-Q (blue)	Sacrificial Values: Commanding absolute belief in one right way and obedience to authority, Salvation, Order, Security, Absolutism
E-R (orange)	Materialistic Values: Inventing and possibility thinking, focused on making things better for self. Rationalism, Multiplism, Independance
F-S (green)	Relativistic Values: Sharing equality and seeking the well-being of people; building consensus as highest priority, Community, Affiliation
G-T (yellow)	Existential Values: Adapting flexibly to change through connected, systemic views, Self-worth
H-U (turquoise)	Experientialistic Values: Attending to whole-Earth dynamics and macro-level actions, Communion

(Graves, 1974, Beck & Cowan, 2007 and Hamilton, 2012)

# Finding of Studies 1 & 2

## **Study 1 (Caspers et al. 2011):**

38 healthy German-speaking test persons (21 male, average age = 39.7 years, 17 female, average age = 33.7 years) were selected from a larger test group and asked to choose between value-loaden abstract term pairs within the framework of a forced-choice fMRI research design.

On basis of fMRI data, only classification of different processing patterns between individualistic and collectivistic value concepts could be established. Such a distinction was also recognizable between subsistence and being levels related value terminology.

## **Study 2 (Caspers et al. 2012):**

35 healthy German-speaking executives (22 male, 22 female, average age = 44.3 years) from the fields of science and economics and 35 non-managerial staff (average age = 40.4 years, 23 male, 12 female) were examined through fMRI in the same study design.

Differences were seen in recruiting of brain areas in terms of dominance of the rational or intuitive processing system as assumed on basis of dual process theories.

# Aims of Current Study

**Integration of neuro-, psycho-, and leadership theories via secondary analysis of the data of both studies:**

- a) the personality theory of the Big-5 measured through NEO-FFI with focus on a specific pattern for intuition,
- b) the behavioural data related to the choices made during execution of the fMRI paradigm and
- c) the adult development models (levels of human existence according to Graves which is measured with Values Test as well as ego-development according to Loevinger which is measured with the Washington University Sentence Completion Test).

# “Intuition” and “Sensing” as a pattern of personality traits

## Comparing Big-5 and MBTI in relationship to leadership success

- “Neuroticism” as a general characteristic of negative emotionality or of increased potential for negative activation which at high levels can lead to wrong decisions in the sense of aversion and stress reactions.
- A pattern of low neuroticism, high extraversion and high openness could be described as “intuitive”
- A pattern of low neuroticism but low extraversion and high conscientiousness at the same time could be described as “largely perceptual”.

(Furnham, 1996)

# Descriptive Statistics of Current Study

	Total Sample	Female	Male
<b>Number</b>	125	61	64
<b>Leadership N</b>	52	25	27
<b>No Leadership N</b>	73	36	37
<b>Postformal Stage N (beginning WUSCT late Individualist)</b>	6	2	4
<b>Neurosample Individualist</b>	69	31	37
<b>Neurosample Collectivist</b>	56	30	26

	Age	CFT IQ	Ego Development TPR	Gravity Levels of Existence	System 1 (Intuitive)	System 2 (Sensing)
<b>Mean/ Median</b>	42.26	123.78	Self-Aware (3/4)	Relativistic (F-S)	2.64	2.35
<b>SD</b>	10.23	11.80			0.43	0.29
<b>Min</b>	18	94	Conformist (3)	Reactive (A-N)	1.56	1.61
<b>Max</b>	61	153	Autonomous (5)	Experientialistic (H-U)	3.53	3.11

# Ego-Development, Levels of Existence and Neurochoices compared to Leadership

**Hypothesis 1: Managers show a higher degree of development with regard to adult development theories than non-managers and make according choices**

Variable	F	p
Ego Development	12.48	<0.01
Gravity Levels of Existence	0.46	ns
Neurochoices	1.98	ns

Independent Samples T-Test

Managers differ from non-managers in their level of Ego Development, in the sense of a higher level of development, but not in the Levels of Existence. Value choices did not differ significantly.

# “Intuition” and “Sensing” Personality Patterns compared to Leadership

**Hypothesis 2: Managers display a personality type that is closer to the “intuitive” type. Non-managers display a personality type that is closer to the “globally perceptive” type**

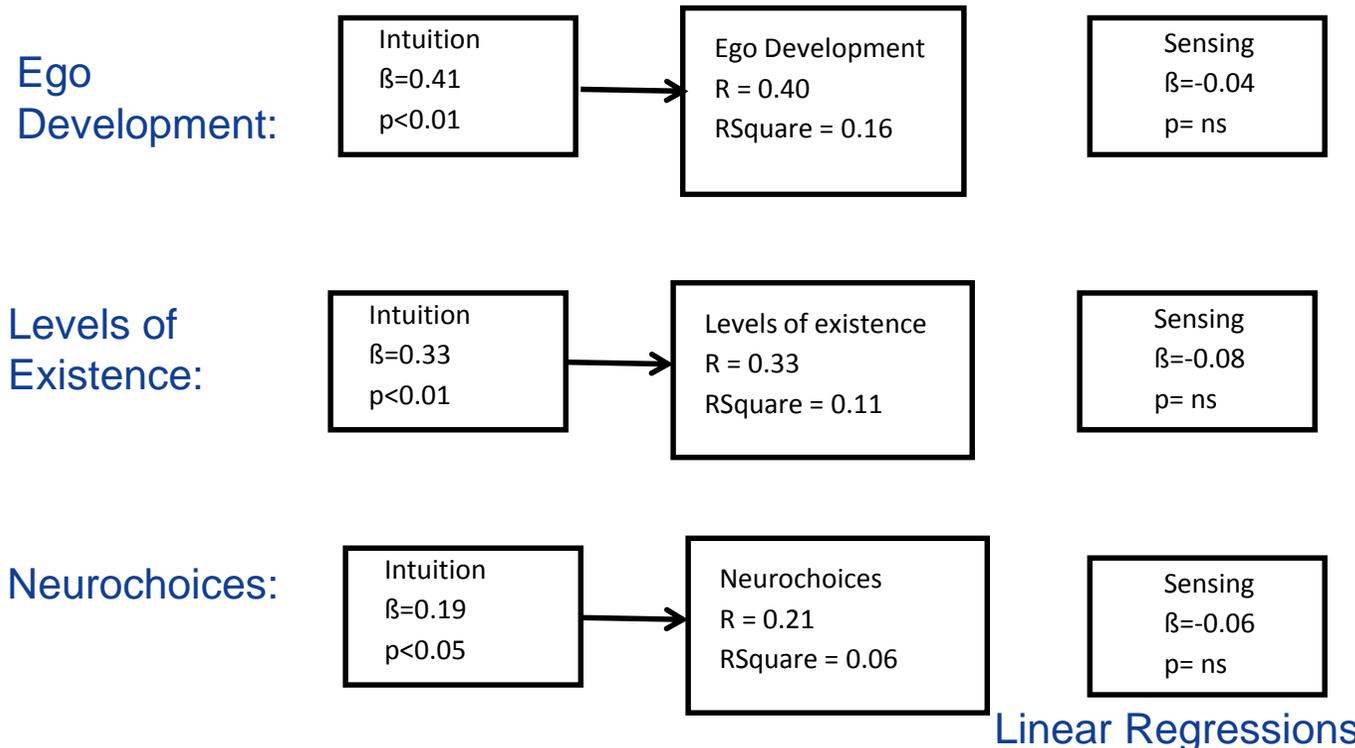
Variable	F	p
System 1 (Intuition)	1.38	ns
System 2 (Sensing)	1.64	ns

Independent Samples T-Test

Hypothesis 2 has to be rejected.

# Effects of “Intuition” and “Sensing” on Adult Development (AD)

**Hypothesis 3: The “intuitive” personality type correlates strongly to a higher level of adult development than the “globally perceptive” personality type.**



Hypothesis 3 is proven. Nevertheless there are only minor contributions to explaining the total variances measured.

# “Intuition” and “Sensing” compared to AD

**Hypothesis 4: The “globally perceptive” personality type is linked to average levels of adult development and a tendency to make choices that can be attributed to middle LOE.**

Variable	Intuition	Sensing
<b>Ego Development</b>	.39**	.09
<b>No. Conformist SC</b>	-.22*	-.01
<b>No. Self-Aware SC</b>	-.27**	-.08
<b>No. Conscientious SC</b>	.41**	.21*
<b>No. higher SC</b>	.22*	-.10
<b>Levels of Existence</b>	.33**	.11
<b>z value B-O</b>	-.31**	-.26**
<b>z value C-P</b>	-.11	-.14
<b>z value D-Q</b>	-.36**	.01
<b>z value E-R</b>	.09	.12
<b>z value F-S</b>	-.17	-.16
<b>z value G-T</b>	.32**	.25**
<b>Neurochoices</b>	.20*	.12
<b>Choose B-O</b>	-.24**	-.02
<b>Choose C-P</b>	.14	-.17
<b>Choose D-Q</b>	-.16	.09
<b>Choose E-R</b>	.15	.15
<b>Choose F-S</b>	-.09	-.12
<b>Choose G-T</b>	.17	.10

Hypothesis 4 can only be proven for Ego Development.

# “Neuroticism” compared to AD

**Hypothesis 5: The “neuroticism” personality trait is linked to a low level of adult development and according choices.**

Variable	F	p
Ego Development	1.17	ns
Gravity Levels of Existence	2.00	<0.01
Neurochoices	1.29	ns

One-Way ANOVA

There is a significant negative correlation between the stage of development in the Levels of Existence and neuroticism. However, this correlation could not be proven for Ego Development.

## Exploration and Differentiation of AD into three Realms

- It is likely that the Levels of Existence are more strongly bound up with emotions – particularly the degree of aversive activation of the circumplex model of emotion – while ego development is more closely linked to the System I and System II activation.
- This indicates a potentially comprehensive integration of neuroscientific and psychological theories and findings with the three activation components of negative affect, intuitive processing and cognitive appraisal. These are significantly correlated to the corresponding neurological processes and also to the corresponding stages in adult development.
- Methodological weaknesses - especially of the questionnaires used - have to be addressed.
- Future research should use fMRI data to gain further insights into the neurobiological correlates of the postulated System I and System II variables.
- Prospects of a longitudinal research design using a web-based test-system.

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