UNIVERSITÄT MANNHEIM

UNIVERSITY OF MANNHEIM

Department for Psychology
Doctoral Dissertation

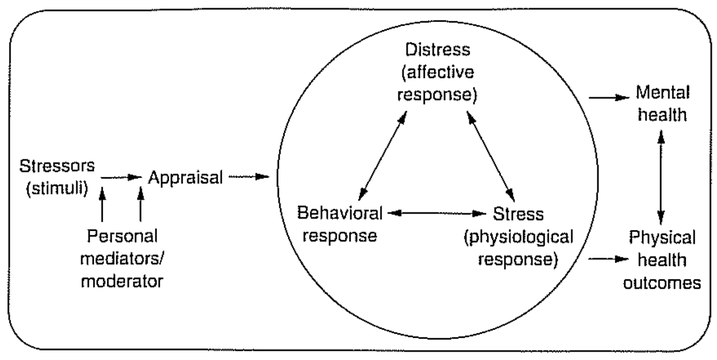
STRESS & CREATIVITY

one adaption mechanism?

NEEPS

2 Complex Constructs:

Stress



Bio-psych. model of stress, Ice & James (2007)

Creativity

1	2	3
DOMAIN-RELEVANT SKILLS	CREATIVITY-RELEVANT SKILLS	TASK MOTIVATION
INCLUDES: – KNOWLEDGE ABOUT THE DOMAIN – TECHNICAL SKILLS REQUIRED – SPECIAL DOMAIN-RELEVANT "TALENT" DEPENDS ON: – INNATE COGNITIVE ABILITIES – INNATE PERCEPTUAL AND MOTOR SKILLS – FORMAL AND INFORMAL EDUCATION	INCLUDES: – APPROPRIATE COGNITIVE STYLE – IMPLICIT OR EXPLICIT KNOWLEDGE OF HEURISTICS FOR GENERATING NOVEL IDEAS – CONDUCIVE WORK STYLE DEPENDS ON: – TRAINING – EXPERIENCE IN IDEA GENERATION – PERSONALITY CHARACTERISTICS	INCLUDES: – ATTITUDES TOWARD THE TASK – PERCEPTIONS OF OWN MOTIVATION FOR UNDERTAKING THE TASK DEPENDS ON: – INITIAL LEVEL OF INTRINSIC MOTIVATION TOWARD THE TASK – PRESENCE OR ABSENCE OF SALIENT EXTRINSIC CONSTRAINTS IN THE SOCIAL ENVIRONMENT – INDIVIDUAL ABILITY TO COGNITIVELY MINIMIZE EXTRINSIC CONSTRAINTS

Componentual model of creativity by Amabile (1983)

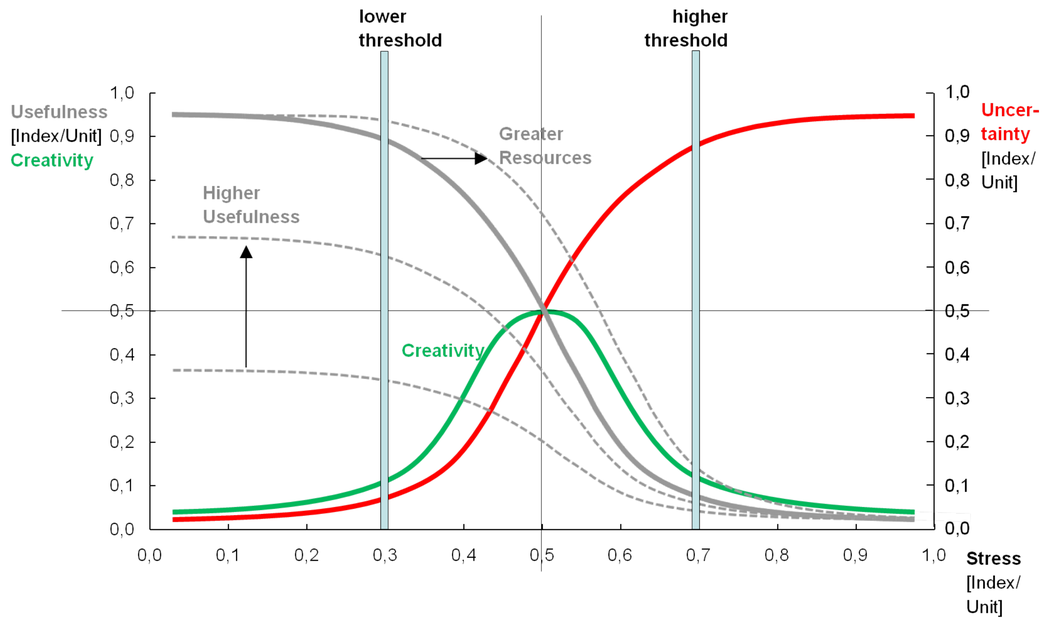
What do they have in common?

- Human neuroendocrine stress system is highly sensitive to **social** challenges (Flinn, 2007; Kirschbaum et.al. 1993).
- Stressing life events are almost all **social** (Holmes & Masuda, 1967)
- Early life exposure to stress via constrained **maternal** care may result in a vulnerable, chronically stressed phenotype (Bardi et.al. 2005).

- There is no context-free creativity-definition: creativity is a „genuinely **social** phenomenon“.
- **Social** constraints like rewards, competition or external evaluation may lead to decrements in creativity (Amabile, 1979, 1986).
- As human intelligence is social, and creativity is part of it, creativity must also have a **social** quality (van Schaik, 2007; Jäger et.al. 1997).

Evolutionary Approach:

Both stress and creativity are socially highly responsive and could be part of one adaptive mechanism that effectively accesses and socially uses the individual‘s creativity.



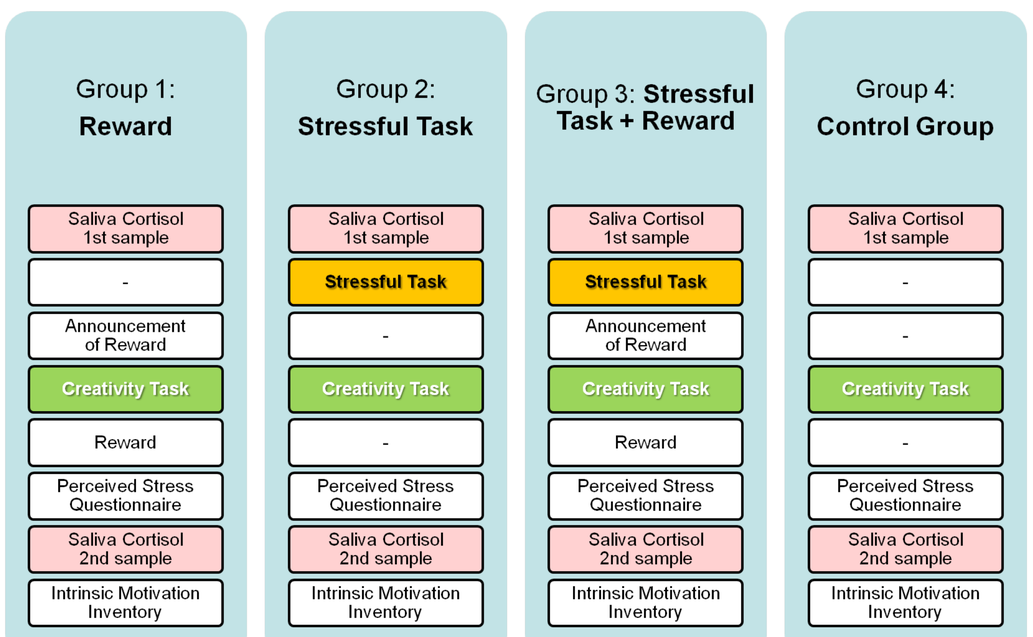
Creativity is commonly defined as the ability to create something both new and in a given social context useful. To actually create something new and useful, an individual has to tap into the area of uncertainty (see the red curve on the left).

Tapping into this area is however **stressful** in the sense that it may involve a substantial challenge to the individual. The individual needs a proper motivation to undertake such a challenge as it is also a costly activity involving significant resources.

The **evolutionary reason** for such a creative undertaking could be the usefulness the creative individual is generating for his group: This usefulness could lead to a „positive“ form of stress in the individual as well as to an acceptance of the creative outcome by the group. However, there are boundaries and limits, both to the individual creativity and its social acceptance.

Testing the Approach:

We tested this evolutionary approach to creativity in a controlled laboratory experiment with four experimental groups, each with different stress settings.



In order to test our approach, a **creativity experiment** with 246 undergraduate students has been conducted. We have used a modified version of the „E-scale“ of the „Berlin Intelligence Structure Test“ by Jäger et.al. (1997) which is claimed to measure creativity: 5 questions in which participants had to come up with as much as possible ideas in written or drawing to a specific topic.

The subjects have been randomly alloted to **four different conditions** with each different level of stress. Stress has been induced by time pressure (for all groups), rewards, a stressful task (timed unsolvable questions) as well as a combination of the latter two. In the control group participants had not been stressed other than having to complete the general creativity task.

During the experiment, stess has been monitored both psychologically (using the perceived stress questionnaire PSQ-20 by Fliege et.al., 2001) as well as biologically by taking saliva cortisol samples at the beginning and at the end of the experiment. Further, the motivation of the participants has been measured using the „Intrinsic Motivation Inventory“ (Ryan, 1982). Creativity results are **currently analyzed** by building an index from the fluidity (number of ideas), flexibility (number of different areas from which the ideas came from) and originality (frequency of the specific idea in the whole experiment).

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