HOW TO MAP CULTURAL DIMENSIONS TO USABILITY CRITERIA.

IMPLICATIONS FOR THE DESIGN OF AN AUTOMOTIVE HUMAN-MACHINE INTERFACE.

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Background

- Culture affects memory, judgement & decision making and therefore impacts context of use and perception of a product
- Perception of a product in turn affects its evaluation
- Differences in evaluations of the same product in different countries in terms of usability ratings and interaction performance
- Cultural adaption of automotive HMI
- Marcus and Gould (2000): Guidelines for designing an HMI regarding Hofstede's cultural characteristics

Approach

- Describing a link between the six cultural dimensions by Hofstede and the seven usability criteria defined by ISO-9241
- Based on the terminology, literature and theoretical considerations
- Hofstede's model serves as a cultural framework describing culture along six dimensions: Power Distance (PD), Individualism vs. Collectivism, Uncertainty Avoidance (UA), Masculinity vs. Femininity, Short- vs. Long-Term Time Orientation (STO vs. LTO), Indulgence vs. Restraint
- Usability criteria: Controllability, Self-Descriptiveness, Task-Appropriation, Error-Tolerance, Conformity, Learnability and User-Engagement

Figure 1: Mapping cultural dimensions (Hofstede) to usability criteria (ISO-9241).
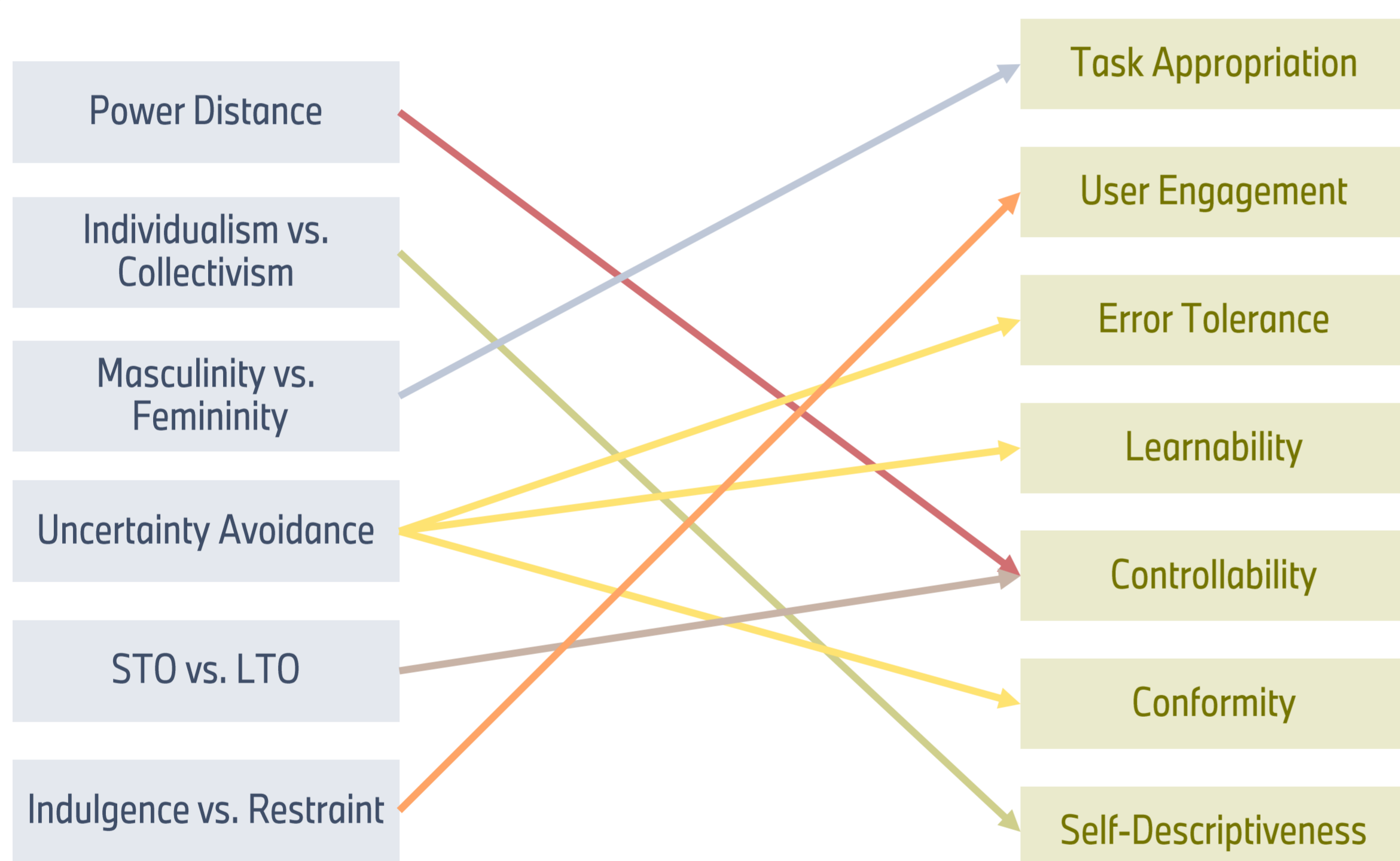
Discussion and Further Research

- One-to-one mapping impossible and impracticable (due to interdependencies
- Ideas are preliminary and must be investigated in depth
- Developing different HMIs adapted to the merging of usability criteria and cultural dimensions
- Including both HMIs in cross-cultural studies to determine whether an adapted HMI indeed results in superior usability ratings in the culture it was designed for
- Mixed within-between-subjects design with HMI design being the within-subject factor and country being the between-subjects factor
- Independent variable: HMI will be manipulated based on the implications derived from the presented theoretical considerations
- Self-report and behavioral measures

Mapping	Specification	Implications
Individualism vs. Collectivism and Self- Descriptiveness	Individual	Emphasize the driver's possible action; usage of icons and emojis is rather spare
	Collectivistic	More granular and elaborated voice output; use of icons as feedback about status; emphasizing cooperation; „we"-form
Masculinity vs. Femininty and Task Appropriation	Masculine	Including games (e.g., to contribute to a more sustainable driving behavior)
	Feminine	Focus on visual aesthetics and design
Uncertainty Avoidance and Conformity	High UA	User's language and expressions to fit the user's expecatitions and mental models; no proactive actions
	Low UA	Proactive actions desired

Table 1: Implications for the design of automotive UI for some of the matched constructs.

BMW GROUP   THE NEXT 100 YEARS