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# The Preferences For Creativity Scale (PCS): Identifying The Underlying Constructs Of Creative Concept Selection

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## Background and Motivation

The current study was developed to investigate the factors that affect preferences for creativity during the engineering design process through the development of a psychometric scale, the Preferences for Creativity Scale (PCS). This study also explores the impact of student designer's scores on the PCS to their behavior during a creative concept selection activity.



**A 116-item survey** with a 5-point Likert-type scale was constructed from prior research on creativity and decision-making.

I believe that creative designs will lead to positive design outcomes

Very Inaccurate    Moderately Inaccurate    Neither Accurate nor Inaccurate    Moderately Accurate    Very Accurate

**280 engineering students** completed the online survey

**Exploratory Factor Analysis** yielded 4 factors:  
Total Variance Explained by the Model = 56.1%

**Confirmatory Factor Analysis** showed good model fit:  
RMSEA = 0.069

## Survey Development and Study Methodology

178 students' completed a design activity.

Participants formed 3 and 4-member design teams, were asked to generate ideas, and **individually assess** all team members' ideas

Participant code	Idea #	Brief Description of Idea	Is this idea worth considering for further design?	
			Consider	Do Not Consider
e11ur	1	Magnetic plate moves frother	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e11ur	2	Multiple whisks	<input type="checkbox"/>	<input checked="" type="checkbox"/>
m25re	4	propeller w/ press air	<input checked="" type="checkbox"/>	<input type="checkbox"/>
m25re	2	tube into milk	<input type="checkbox"/>	<input checked="" type="checkbox"/>

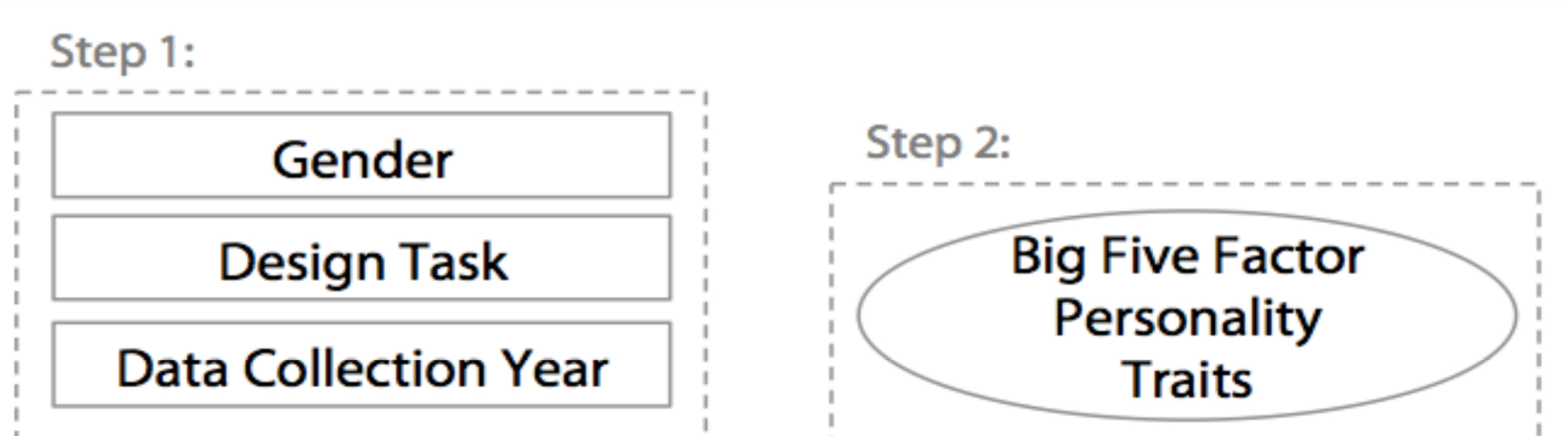
## Factor Analysis and Regression Results

"I play a central role in teams I am a part of." **TEAM CENTRALITY AND INFLUENCE**

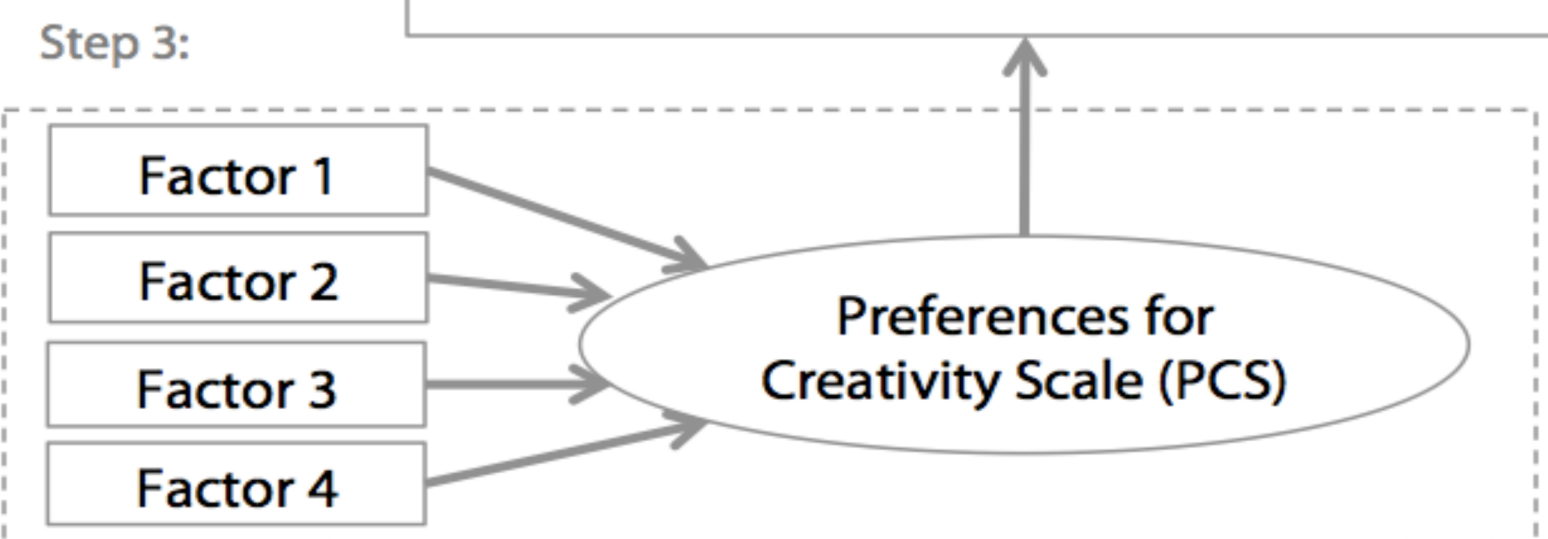
"I prefer taking risks during design projects" **RISK TOLERANCE**

"I believe that I am a creative individual" **CREATIVE CONFIDENCE AND PREFERENCE**

"I am not easily discouraged when I am being criticized" **MOTIVATION**



Novelty/ Quality of Selected Ideas



Hierarchical Regression Analysis was conducted

## Conclusion

The results of the Exploratory and Confirmatory factor analysis reveal the 4 underlying factors that can impact preferences for creativity during concept selection. These results show that social or contextual factors dominate preferences for creativity in an engineering design setting, and that specific PCS factors are able to predict designers' behaviors for selecting novel ideas during a concept selection activity.

**The PCS** predicts the novelty of selected ideas above and beyond the effects of covariates and the Big 5 Factor Personality traits ( $R^2$  change = 0.02,  $p = 0.02$ ).

**Factor 1: Team Centrality and Influence** ( $B = 0.02$ ,  $p = 0.05$ ) and **Factor 2: Risk Tolerance** significantly predicted the novelty of selected ideas ( $B = 0.01$ ,  $p = 0.04$ )