Domain Differences in the Valuation of Creative Problem Finding and Problem Solving

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Introduction

"The formulation of a problem is often more essential than its solution, which may be merely a matter of mathematical or experimental skill. To raise new questions, new possibilities, to regard old problems from a new angle requires creative imagination and marks real advances in science." – (Einstein, Infeld 1966)

Problem solving and problem finding are two discreet modes of creativity; "problem finding" is associated with preparation and formulation (akin to the preparation and incubation stage in Wallas' model) while "problem solving" relates more to evaluations and drawing conclusions (like the illumination and verification stages in Wallas' model) (Nemiro, Runco 1994) (Wallas, 1926).

In this study, we are interested in whether individuals value these discreet parts of the creative process differently, and if so, if that difference varies as a function of domain (where the different domains we use are Mathematics, Music, Visual art, etc.).

Method

Participants

Participants – 104 members of the greater SUNY Potsdam community.

Procedure

Participants were given a Qualtrics survey asking them to choose between a series of forced choice questions designed to highlight one aspect of the creative process (problem finding or problem solving) in a given creative domain.

The domains of creativity we used were music, mathematics, visual art (sculpture) and the social sciences.

Results

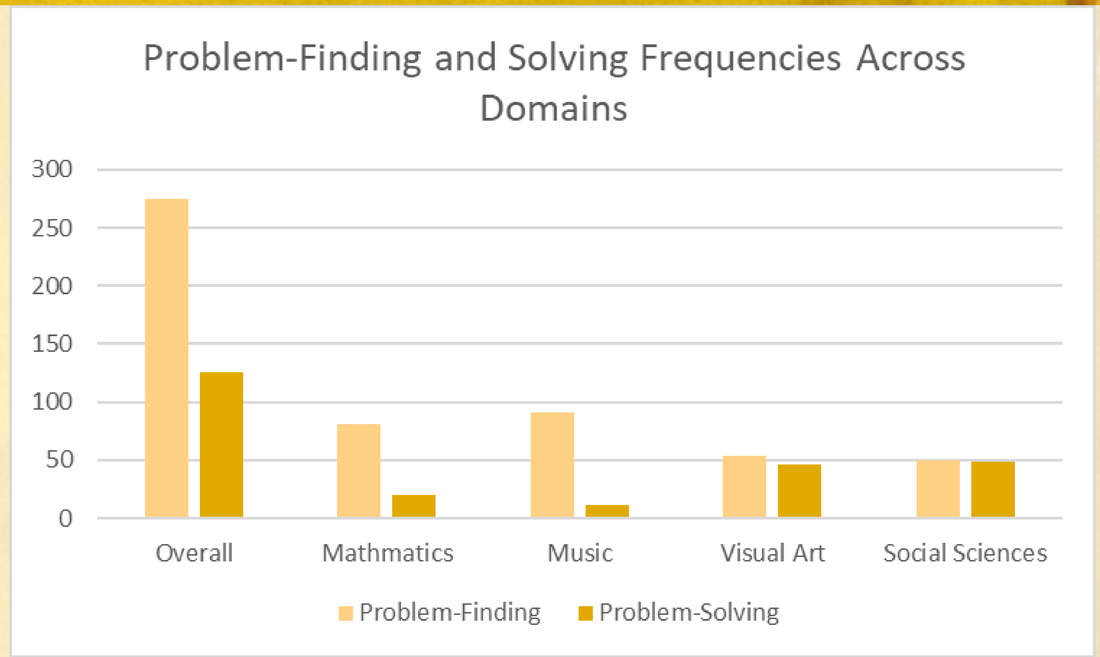
Chi Square Test of Independence:

Overall – an aggregate analysis suggests that across domains, individuals seem to value problem-finding ($n = 479$) over problem-solving ($n = 221$), $x2(1) = 95.09$, $p < .01$.

Significant domain specific results –

Mathematics – Our findings indicated individuals valued the mathematician who discovered a seeming paradox in the foundations of mathematics ($n = 81$) over the mathematician who seemed to solve it ($n = 20$). This may suggest a primacy for problematic incubation in mathematics (Einstein seemed to think this), $x2(1) = 36.84$, $p < .01$.

Music – When presented with the choice, individuals overwhelmingly seemed to prefer attending the performances of original artists ($n = 91$) rather than going to see a cover band (a band who specializes in playing the music of other bands) ($n = 11$). While not unexpected, the primacy of seeing the original composer preform the music they create may be linked to the value individuals have in the formulation, or construction, of a problem, $x2(1) = 62.75$, $p < .01$.



Discussion

Previous work indicates that problem-finding and problem-solving are discreet aspects of creativity (Nemiro, Runco 1994). Current findings suggest that in the domains of Mathematics and Music specifically, individuals tend to value problem-finding more than problem-solving.

The data concerning the visual arts (represented here in the form of sculpture) and the social sciences (experimentation), on their own do not suggest significant findings; this, though, could be due to a possible confound – skill, or a slight flaw in the methodology. For visual arts: conceptual drawings (problem-finding) were inadvertently pitted against the completed sculpture (problem-solving). The conditions aren't methodologically equivalent, and sculpting can be perceived as more skillful and potentially more effortful than drawing.

Furthermore, for our Social Science example we may have a similar issue. The findings regarding these two conditions should not be interpreted with much weight and future research should balance these conditions and examine perceived skill as a possible moderator. With that said, an analysis of the aggregate responses shows a bias in valuation towards problem-finding rather than problem-solving.

References

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