The View From Somewhere

Perspective and Relational Foundation of Outer Space Perception

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Introduction

Despite the mesmerizing effect of outer space, there is little to no research concerning its aesthetics. However, perception of Earth from an outer space perspective can have transformative and intense effects. Journalist Frank White (1987) coined the term "Overview-Effect" (OE). Later research identified the OE as an example of a state of awe, combined with elements of a self-transcendent experience (Yaden et al., 2016). Awe relies on the perception of vastness and the need for schematic accommodation (Keltner & Haidt, 2003). The properties of outer space may exert these factors so much that the resulting impression may be fundamentally different from everything possibly experienced on Earth.

Starting from the notion of the OE and following an exploratory approach, our study aims to understand the factors that define outer space perception. Doing so, we were interested in the role of perspective and frame of reference. The Earth can be experienced every day, and outer space and its celestial bodies can be impressively perceived every night. This opportunity exists for a much longer time than the ability to perceive Earth from outer space. Yet, it is the latter one that evokes the OE. These anecdotes suggest that percept (Earth) and unique perspective (outer space) somewhat interact to constitute the discussed effects. We systematically manipulated both factors to investigate the combinations on which the overwhelming experience of seeing the Earth from outer space and other visual impressions depend.

Method

Participants. N = 67 completed an online survey (54 F, age M = 22.3 years, SD = 4.39, range = 18-28 years).

Stimuli. We searched publically available sources (NASA, ESA Southern Observatory) for space-related images. Pictures varied across two main factors: Perspective and Content. Pictures varied across two main factors: Perspective (2) and Content (3x2). Dimensions of content were fully crossed. We provided three pictures for each content combination in each perspective (combined set 21x2 = 42 images). An outside perspective forces technological constraints on any photography, meaning that they could not depict stars or star formations like the Milky Way. These types of photography would need long exposure time and precise tracking. Therefore, only some pictures in the inside perspective showed stars and star formations in their respective condition. We tried to show the content at different scales from near to far.

Procedure. Participants rated the randomized pictures on whether they induced the following eight feelings and impressions: Awe, loneliness, danger, liking, thoughtfulness, spirituality, technicity, and beauty. Ratings were conducted on Likert-Scales, ranging from 1 – not at all to 7 – very much.

Results

Correlations are shown in Figure 1. We conducted a 2x7 ANOVA with perspective and content composition as factors. Results are shown in Table 1 and consistently revealed large main and interaction effects. Figure 4 shows the 10 pictures with the highest, respectively lowest mean ratings of danger.

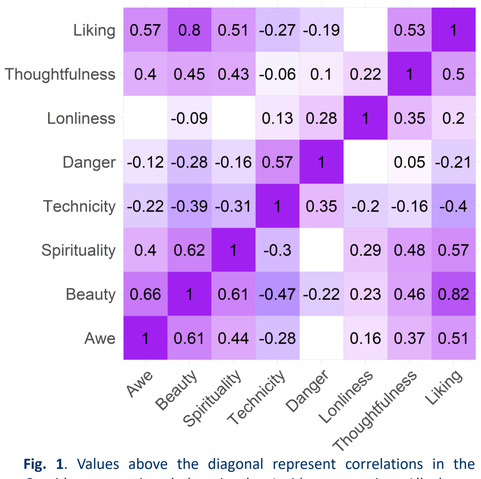


Fig. 1. Values above the diagonal represent correlations in the *Outside* perspective, below in the *Inside* perspective. All shown values $p < 0.05$.

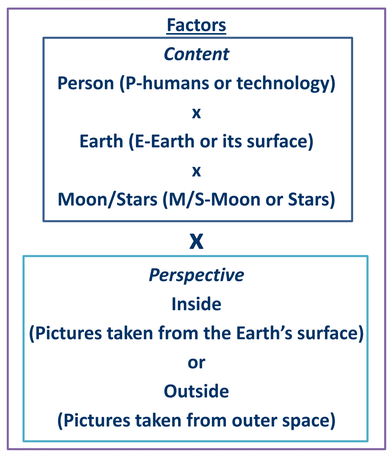


Fig. 2. Factors and their combination. Letters in the other figures indicate the presence of the respective content dimension.

***Table 1*. Results of a 2 (Perspective) x 7 (Picture Content) ANOVA on the Outcomes**

	Outcome						
	Awe	Beauty	Spirituality	Technicity	Danger	Lonliness	Liking
F(13,2800)	44.52*	141.00*	77.09*	315.8*	87.4*	49.16*	73.19*
Factor				**Perspective**			
F(1)	67.32*	342.45*	191.83*	320.30*	330.87*	64.50*	193.96*
η^2	0.020	0.074	0.050	0.046	0.084	0.019	0.052
η_p^2	0.023	0.109	0.064	0.103	0.106	0.023	0.065
Factor				**Content**			
F(6)	61.54*	193.78*	11.76*	609.80*	107.01*	56.08*	93.11*
η^2	0.109	0.251	0.175	0.530	0.163	0.098	0.149
η_p^2	0.117	0.293	0.192	0.566	0.187	0.107	0.166
Factor				**Perspective X Content**			
F(6)	23.70*	54.71*	24.30*	20.97*	27.22*	39.69*	33.14*
η^2	0.042	0.071	0.038	0.018	0.041	0.069	0.053
η_p^2	0.048	0.105	0.049	0.043	0.055	0.078	0.066

Note. *: p < .001.

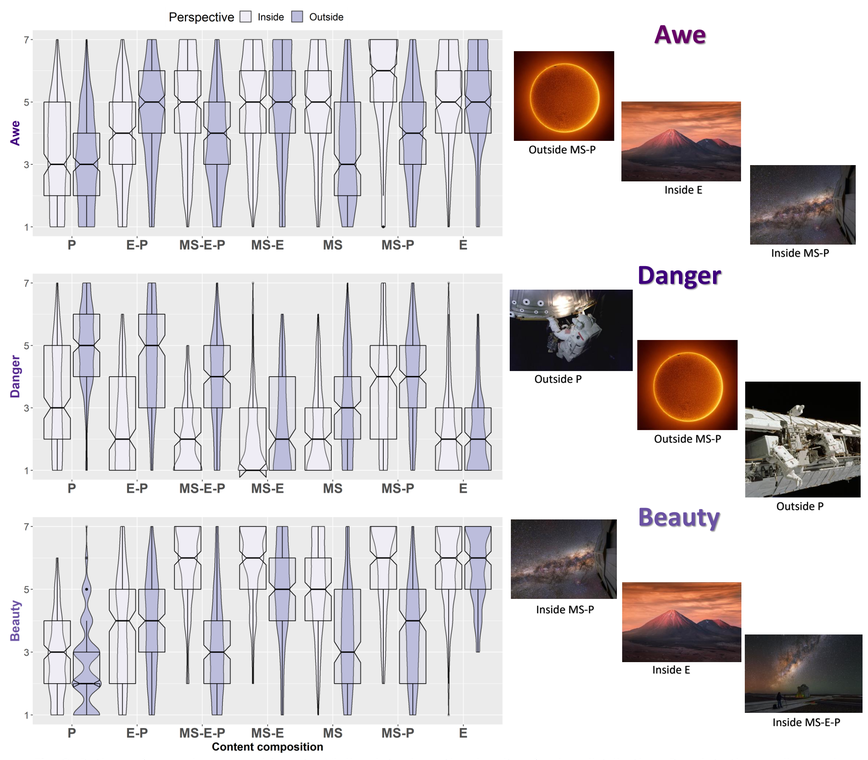
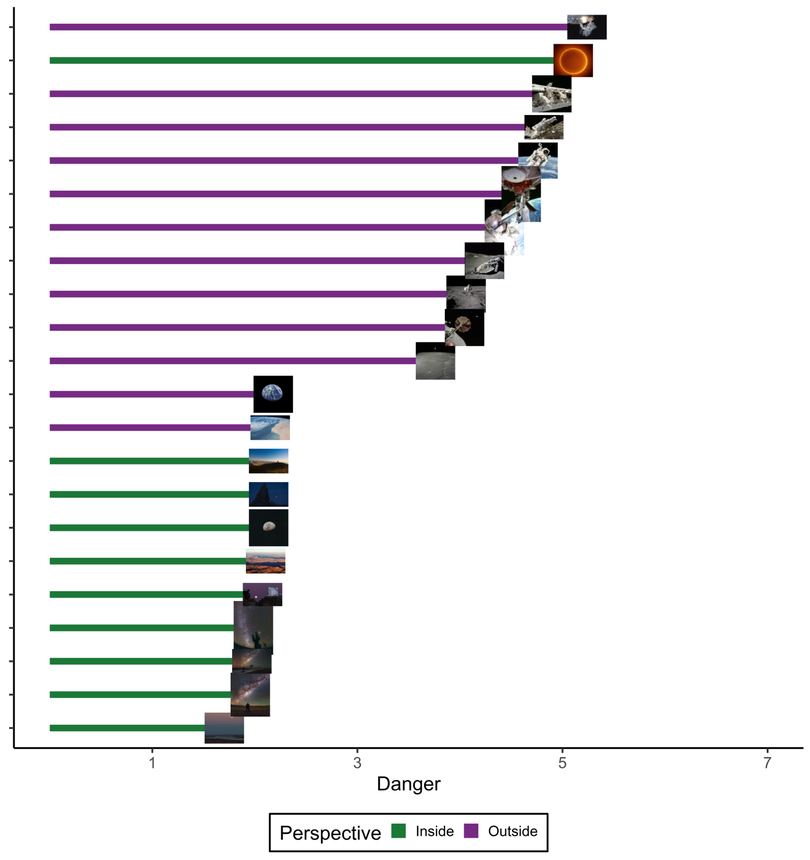


Fig. 3. Ratings of awe, danger, and beauty. Violin plots show the density of value distribution. Boxplots the median and quartile range. Not overlapping notches suggest significantly different median values. Pictures besides the plot are the three highest rated pictures in the respective scale and their perspective/content.

Figure 4. Pictures With the Highest/Lowest Ratings of Danger



Discussion

In rating pictures from outer space, not only content but also perspective matters. When humans and the vastness of outer space were contrasted, danger was evoked mainly from an outside perspective in which the observer virtually took over a perspective of someone being in space. However, an outside perspective alone was not sufficient. Images that showed outer space together with humans or human-made technology were more likely to evoke this feeling. Combined with the general more dangerous outside perspective, it was crucial to see something that actually is in danger. This effect exemplifies the relational aspect of perception. This relational effect was also present in the ratings of the other outcomes.

Each of the combinations between perspective and content offered the observer the possibility to form new impressions. A view from outer space provides a truly unique perspective on well-known entities. But also an internal perspective can lead to new experiences, if new relations between the percepts arise due to their special content compositions. Our findings suggest that relating the perceptual impression to the observing perspective is crucial for evoking the feeling of awe in general and the OE in particular.

Aesthetic valuation of outer space pictures may be explained by their strange and mysterious nature, triggering the desire for exploration (cf. Kaplan, 1987). In their philosophical and scientific quest of gaining a glimpse of objective knowledge about the conditions of their existence, humans try to view themselves from an external perspective. The perception of space seems to have a fundamental relational basis, and it is the possibility of adopting a unique and new perspective that allows observers to establish new relationships. However, any resulting accommodation is not unique to an outside perspective but can also be achieved by relating percepts on Earth. In conclusion, it is important to note that the results of the outer space view from somewhere are constituted by the tripartite reciprocal relationship between percept, perspective and perceiver.

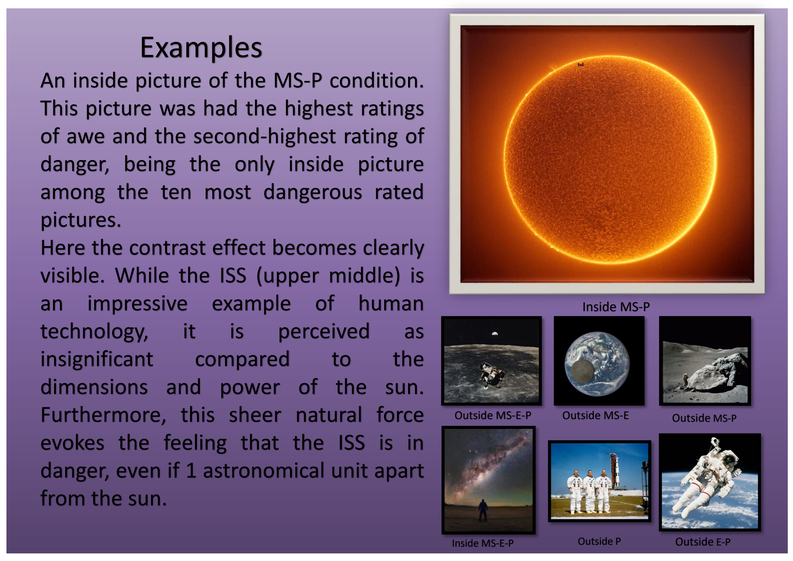


Figure 5. Mean Ratings for the MS-E-P Pictures

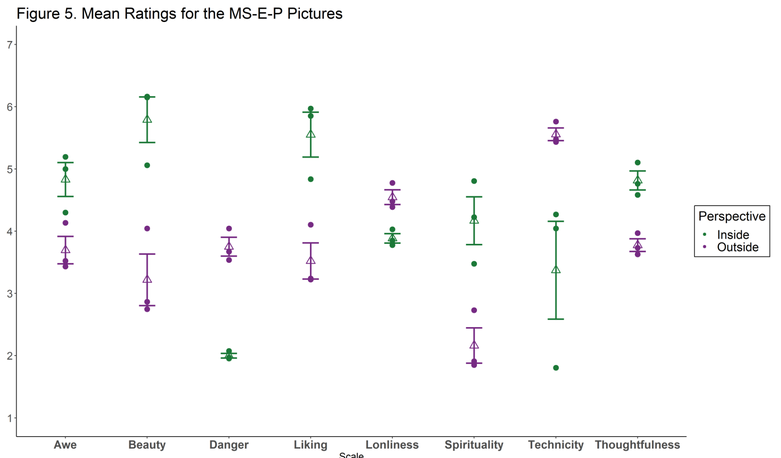


Fig. 5. Dots represent the mean for one MS-E-P picture (3 in every perspective). Triangle = group mean. Error bars = SE.

References

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Picture credit

NASA, ESO, Juan Carlos Munoz-Mateos, Bill Ingalls, B. Tafreshi, M. Tarenghi, Y. Beletsky, H.H.Heyer, Iztok Boncina, P. Horálek, C. Malin,

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