

Aligning Scientific Values and Research Integrity:

A Cross-Cultural Analysis of Researchers' Perceptions and Practices

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OBJECTIVES

While the value-based approach to addressing research misconduct is gaining increasing attention, empirical evidence concerning the relationship between scientists' adherence to scientific values and their research integrity behaviors remains scarce. This study seeks to examine researchers' perceptions and practices regarding research integrity across 4 countries.

METHOD

An online survey was formulated and administered in four countries: Belgium, China, the Netherlands, and Vietnam. Three key variables were computed and subjected to analysis:

- (1) **value adherence**, denoting participants' subscription with Merton's scientific ethos;
 - (2) **the level of acceptance of research misconduct**, i.e. how acceptable participants find various instances of research misconduct;
 - (3) **the misbehavior level**, as indicated by participants' self-reported transgressions.
- Statistical analyses were executed to examine the relationships among these variables and to discern differences within specific groups, such as country, age, scientific field, and academic position.

RESULTS

SUMMARY

A total of 765 valid questionnaire responses were collected. The findings reveal significant correlations among three variables, with the most robust correlation detected between the level of acceptance and misbehavior level (correlation coefficient of 0.510, $p < 0.001$), and a negative correlation between value adherence and the level of acceptance.

IMPACT

The results confirm the correlations between value adherence, level of acceptance of research misbehavior, and misbehavior level, denoting necessities and importance of aligning scientific values and research integrity education. Therefore, this study contributes to the growing body of research on scientific integrity by providing empirical evidence of cultural and contextual variations in researchers' attitudes and behaviors.

REFERENCES

1. Anderson, M. S., Ronning, E. A., Vries, R. D., & Martinson, B. C. (2010). Extending the Mertonian norms: Scientists' subscription to norms of research. *The Journal of higher education*, 81(3), 366-393.
2. Fanelli, D. (2009). How many scientists fabricate and falsify research? A systematic review and meta-analysis of survey data. *PLoS One*, 4(5), e5738.
3. Hofmann, B., & Holm, S. (2019). Research integrity: environment, experience, or ethos? *Research Ethics*, 15(3-4), 1-13.
4. Tang, L. (2019). Five ways China must cultivate research integrity. *Nature*, 575(7784), 589-591.

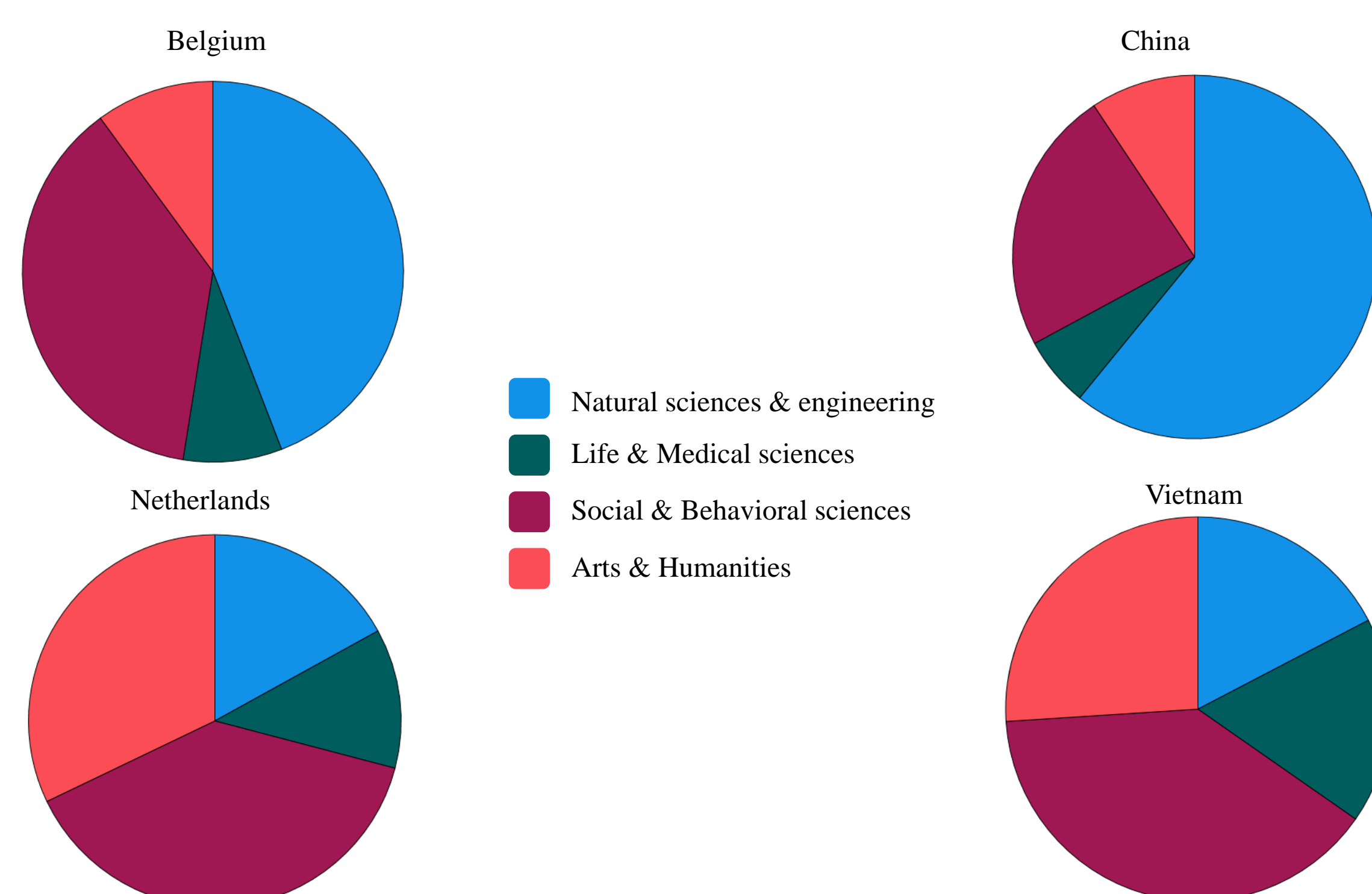


Figure 1. Academic backgrounds of participants from each country

	ALL	Belgium	China	Netherlands	Vietnam
Plagiarism	1.53	1.41	1.59	1.45	1.65
Fabrication	1.46	1.47	1.16	1.28	1.94
Non-adherence to research ethics of human participants	1.39	1.26	1.48	1.24	1.54
Falsification	1.32	1.17	1.23	1.18	1.66

Table 1. Level of acceptance of research misbehavior across countries (The lower the score, the less acceptable participants find research misbehavior.)

	*Value adherence	Sig. (2-tailed)	*Level of acceptance	Sig. (2-tailed)	*Misbehavior level	Sig. (2-tailed)
COUNTRY	Mean		Mean		Mean	
Belgium	4.27	<.001	1.88	<.001	2.16	<.001
China	3.70		1.97		2.01	
Netherlands	4.24		1.76		1.6	
Vietnam	3.96		2.25		4.97	
RESEARCH FIELD						
Natural sciences & engineering	3.96	0.05	1.91	<.001	2.46	0.194
Life & Medical sciences	4.07		1.86		2.54	
Social & Behavioral sciences	4.07		2.02		2.76	
Arts & Humanities	4.02		2.10		3.24	
POSITION						
PHD	4.19	<.001	2.01	<.001	3.14	<.001
Post-doc	4.22		1.88		2.12	
Assistant Professor	3.98		2.04		2.81	
Associate Professor	3.80		2.06		2.77	
Full Professor	4.00		1.76		1.78	
Others	4.06		2.21		4.3	
AGE GROUP						
20-29	4.11	<.001	2.00	<.001	2.63	<.001
30-39	3.97		1.98		2.62	
40-49	3.97		2.08		3.44	
50-59	3.98		1.92		2.18	
Above 60	4.32		1.65		1.49	
GENDER						
Male	4.00	0.048	1.93	0.022	2.46	0.002
Female	4.06		2.03		3.07	

Table 2. Result of comparative analysis between groups

*The variables "Value adherence" "Level of acceptance" and "Misbehavior level" were computed based on the responses of participants. The responses were numerically coded, with a value of 1 assigned to "shouldn't adhere to scientific value" "completely unacceptable" and "never committed such behavior", and a value of 5 to "always should adhere to scientific value", "completely acceptable" and "frequently". Therefore, the lower the score: (1) the less adherence to scientific value; (2) the less acceptable participants find research misbehavior; (3) the low frequency of self-reported committing research misbehavior. The higher the score is, (1) the more adherence to scientific value; (2) the more acceptable participants find research misbehavior; (3) the higher frequency of self-reported committing research misbehavior.

RESULTS

Descriptive analysis:

- Value adherence: **Universalism** received the highest level of subscription while organized skepticism received the lowest.
- Level of acceptance: **Falsification, fabrication, plagiarism and non-adherence to research ethics of human participants** were considered among the top five most unacceptable behaviors by participants from all four countries (Table 1).
- Misbehavior level: Overall, participants reported the lowest frequencies of committing non-adherence to research ethics (5.5%), fabrication (6.9%), falsification (14.2%), and plagiarism (18.6%).

Difference across countries, age, gender, and research field:

- Chinese participants showed the lowest value adherence, significantly lower than the other three countries. Vietnamese participants exhibited the highest level of acceptance of research misconduct and the highest level of self-reported committed research misbehavior as well.
- Participants aged above 60 exhibited significantly higher value adherence, along with significantly lower levels of acceptance and misbehavior level compared to other age groups. Participants in the 40-49 age group reported significantly higher self-reported misbehavior compared to those aged above 50.
- Male participants' mean scores across all three variables were consistently lower than those of their female counterparts.

Correlations between three variables: (see Table 2).

- There was a negative correlation between value adherence and the level of acceptance of research misbehaviors (correlation coefficient of **-0.337, $p < 0.001$**).
- A positive correlation between the level of acceptance and the misbehavior level (correlation coefficient of **0.510, $p < 0.001$**) was observed.
- There was a negative correlation between value adherence and the misbehavior level, albeit with a relatively low correlation coefficient (**-0.181, $p < 0.001$**).