

# The Association between Researchers' Conceptions of Research and Their Strategic Research Agendas

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## Abstract

**Purpose:** In studies of the research process, the association between how researchers conceptualize research and their strategic research agendas has been largely overlooked. This study aims to address this gap.

**Design/methodology/approach:** This study analyzes this relationship using a dataset of more than 8,500 researchers across all scientific fields and the globe. It studies the associations between the dimensions of two inventories: the Conceptions of Research Inventory (CoRI) and the Multi-Dimensional Research Agenda Inventory—Revised (MDRAI-R).

**Findings:** The findings show a relatively strong association between researchers' conceptions of research and their research agendas. While all conceptions of research are positively related to scientific ambition, the findings are mixed regarding how the dimensions of the two inventories relate to one another, which is significant for those seeking to understand the knowledge production process better.

**Research limitations:** The study relies on self-reported data, which always carries a risk of response bias.

**Practical implications:** The findings provide a greater understanding of the inner workings of knowledge processes and indicate that the two inventories, whether used individually or in combination, may provide complementary analytical perspectives to research performance indicators. They may thus offer important insights for managers of research environments regarding how to assess the research culture, beliefs, and conceptualizations of individual researchers and research teams when designing strategies to promote specific institutional research focuses and strategies.

**Originality/value:** To the best of the authors' knowledge, this is the first study to associate research agendas and conceptions of research. It is based on a large sample of researchers working worldwide and in all fields of knowledge, which ensures that the findings have a



reasonable degree of generalizability to the global population of researchers.

**Keywords** Conception of research; Research agendas; Researchers' beliefs; Research strategy; Views of research; Research processes

## 1 Introduction

An understanding of the research process is central to fostering the development of innovative knowledge that can be used to tackle the complex global challenges faced by humanity (Hoolohan, Mclachlan, & Larkin, 2019). In the ongoing race for knowledge advancement and innovation, governments and organizations face pressure to make informed decisions about how best to allocate research funds, improve current policies and incentive frameworks, and promote quality research (Vaesen & Katzav, 2017). Increasing resources are now being invested in research endeavors, leading to more knowledge being produced, even though a managerialism drive has impaired knowledge breakthroughs (Horta & Santos, 2019a). Most of our understanding of knowledge production relies on studies of research productivity and performance, both descriptive and inferential; such studies are informative and useful but are focused mostly on finalized research products such as papers and related bibliometric information complemented by demographic and institutional characteristics (Young, 2015) and additional perspectives are needed.

An understanding of how researchers' mindsets and beliefs are associated with their strategic research approaches is just as pivotal to comprehending the knowledge creation process as an understanding of how environmental frameworks and other determinants shape research production. However, although there is a substantial body of research on the latter (e.g. Bentley, 2014), minimal attention has been paid to the former. Researchers and scientists have not achieved consensus on researchers' own conceptions of research (Fuller, 2012). Conceptions of research matter because the cultural and social ethos guiding the researcher's thinking and beliefs about research—and science in general—influence the motivations, decisions, and aptitudes related to engagement in research choices and interests (Niiniluoto, 2020). This study addresses this research gap and advances recent studies on researchers' preferences for specific research agendas, the majority of which have focused only on a single field or discipline (Foster, Rzhetsky, & Evans, 2015; Horta & Santos, 2016; Ying, Venkatramanan, & Chiu, 2015). This exploratory study aims to answer the following research question: what are the associations between researchers' conceptions of research and their preferences for strategic research approaches? The study is based on two inventories: the Conceptions of Research Inventory (CoRI) (Meyer, Shanahan, & Laugksch, 2007) and the Multi-Dimensional Research Agenda Inventory—Revised (MDRAI-R) (Horta & Santos, 2020).



## 2 Methodology

### 2.1 Inventories used to measure research beliefs and agendas

The CoRI (Appendix 1), developed by Meyer, Shanahan, and Laugksch (2007), comprises five distinct dimensions that collectively represent the views that an individual holds about research. The original CoRI inventory focused on a population of postgraduate students (mostly doctoral students) and academic staff from nine countries, but an overwhelming majority of respondents were from Australia, South Africa, and Finland. CoRI is a follow-up to a previous inventory focused on Australian and South African postgraduate students' conceptions of research, SCoRI, which the authors published two years earlier (Meyer, Shanahan, & Laugksch, 2005). To the best of our knowledge, the current study is the first to apply the CoRI solely to a population of researchers, with no postgraduate students. The dimensions of CoRI are as follows. *Research as the discovery of truth* places truth-seeking goals at the center of research, an idea associated with the research "layer" conception, which is defined as "a process of discovering, uncovering or creating underlying meanings" (Pearson & Brew, 2002). *Research as an insightful process* treats research as a process through which new insights are generated on a topic. *Research viewed as re-search* perceives research as a search for something that has been overlooked. *Finding solutions to problems* views research largely as a problem-solving activity that involves answering specific questions and searching for solutions. *Misconceptions about research* evaluates a respondent's misconceptions regarding research activities, such as the belief that results are guaranteed if the methods are sound or that publication of a given study automatically means that it is reliable.

The MDRAI-R (Appendix 2) comprises eight distinct dimensions that influence the way researchers approach their strategic research agenda (Horta & Santos, 2020). The MDRAI-R was developed after the MDRAI, which focused primarily on academics conducting research in the field of social sciences (Horta & Santos, 2016). The MDRAI-R has dimensions that are mostly consistent with those of the MDRAI, and it has been validated for researchers from all fields of knowledge, developing research inside and outside academia, and working in 154 countries. The dimensions of the MDRAI-R are as follows. *Scientific ambition* stresses research that is likely to provide recognition for one's work and to contribute to achieving a position of intellectual and scientific authority in a field (Latour & Woolgar, 2013); it also relates to determination to publish research work. *Collaboration* combines the desire to collaborate with others and openness to invitations by others to collaborate on research projects (Bozeman & Gaughan, 2011). *Divergence* refers to an interest in various topics and a preference for working on multidisciplinary and/or interdisciplinary research (Abramo, D'Angelo, & Costa, 2018). *Discovery* is the



preference to focus on topics that have the potential to achieve breakthroughs and thus measures the willingness to engage in riskier projects (Popper, 2005). *Tolerance of low funding* represents a willingness to focus on research topics even when the available funding is scarce (Ebadi & Schiffauerova, 2015), and thus it also includes an element of risk that may be influenced by organizational pressures. *Mentor influence* refers to the degree to which the PhD mentor influences a researcher's research plans (Hemmings, 2012). The degree to which the research agenda is *academia-driven* indicates how much a researcher is influenced by scientific priorities for which consensus has been reached by the scientific community (an attribute that is more common among physicists than, for example, sociologists; Becher & Trowler, 2001). This dimension also evaluates the degree to which the research agenda is aligned with the strategic targets and pressures imposed by the institution where the researcher is currently working. The extent to which the research agenda is *society driven* depends on the incidence of social challenges as focal points of research interest and the degree of consultation with and participation of laypersons and non-experts in setting the agenda (Kaiser & Leiner, 2011). Higher scores indicate greater alignment with the defining characteristics of the dimensions.

## 2.2 Data

Using a global sample of 8,555 researchers from all fields of science, a series of ordinary least squares (OLS) regressions (Hair et al., 2007) were conducted to determine the effects of conceptions of research on research agenda setting. Analysis of the OLS residuals was conducted to evaluate the OLS assumptions—notably, homogeneity of variance, linearity, and normality (Hair et al., 2007). The results of this exercise indicated a random pattern of residuals uniformly distributed around the origin coordinates of the scatterplot, which is expected when OLS assumptions are met (Hair et al., 2007). The sample was obtained by identifying authors of published papers in scientific journals indexed in the Scopus database that were published between 2010 and 2016. These authors were invited via e-mail to participate in a survey that took place between June 2017 and August 2018. The instrument included questions about demographics, education, and professional career path, and items from the two instruments described above (CoRI and MDRAI-R). The questions for these instruments were presented to participants in random order to mitigate any bias arising from the question order. In total, 21,106 individuals agreed to participate. However, 12,551 dropped out of the survey without completing the blocks required for this analysis (MDRAI-R and CORI), and they were therefore excluded from the analysis. The sample had global coverage, with a large number of participants in major scientific powerhouse nations, including the US, the UK, France, and Italy. The sample had a greater proportion of male



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( $N = 5,691$ ) than female ( $N = 2,864$ ) researchers, and an average age of around 51 ( $M = 50.751$ ,  $SD = 12.034$ ), which aligns with the global population of researchers. In accordance with the literature (Horta & Santos, 2020; 2019b), several control variables were used: gender, age, time elapsed since obtaining the Ph.D., Field of Science (FoS), whether the institution is top-ranking (in the top 500 of the Leiden Ranking, sorted by publication count using fractional counting), and career internationalization, which indicates whether the researcher is working in a country other than their country of birth (Horta, Jung, & Santos, 2019). Country was also controlled for in the analysis, but it is omitted from the results table for readability. The descriptive statistics of the dependent, explanatory, and control variables are summarized in Table 1.

Table 1. Descriptive statistics.

		Quantitative Variables	M	SD
MDRAI-R dimensions (Dependent variables)	Scientific Ambition		5.073	0.946
	Divergence		5.067	0.918
	Collaboration		5.189	0.826
	Mentor Influence		2.906	1.407
	TTLF		4.210	1.339
	Discovery		5.505	0.922
	Academia Driven Society Driven		4.031 4.066	1.040 1.121
CoRI dimensions	Truth-seeking, research as		3.872	0.982
	Misconceptions about research		2.658	0.949
	Problem-solving, research as		3.804	0.728
	Re-research, research as		3.543	0.743
	Insightful process, research as		4.302	0.530
Control Variables	Age		50.751	12.034
	Years Since PhD		18.129	12.533
	Qualitative Variables		N	%
	Gender			
	Male		5,691	66.52%
	Female		2,864	33.47%
	Field of Science (FoS)			
	Natural & Agricultural Sciences		2,499	29.21%
	Engineering and Technology		1,761	20.58%
	Medical and Health Sciences		1,987	23.23%
	Social Sciences		2,049	23.95%
	Humanities		259	3.02%
	Research University (top 500)			
	Yes		1,838	21.48%
	No		6,717	78.51%
Career internationalization				
Yes		6,423	75.08%	
No		2,132	24.92%	

The descriptive statistics of the sample concerning the MDRAI-R show that *discovery*, *collaboration*, *scientific ambition*, and *divergence* had the highest scores, suggesting that most researchers characterize their research agendas as risk-taking, with the potential to attain disruptive new findings, collaborative, multidisciplinary (which may involve a degree of interdisciplinarity), and scientifically ambitious—or at least, having the potential to increase the researcher's profile in the field. *Mentor influence* was the lowest score dimension, possibly because in some cases, over the course of career advancement, contact with the PhD mentor decreases or is lost, perhaps because the interests of the researcher diverge from those of the PhD supervisor and from the topic of the doctoral studies, or because the mentor has passed away, as most of the respondents had substantial seniority and research experience (average time since PhD was 18 years, and the average age was 50). The descriptive statistics for the CoRI indicate that the most frequently held view of research is *research as an insightful process*, followed at a relative distance by *research as truth seeking* and *research as problem-solving*. Most of the researchers in the sample had low agreement with *misconceptions about research*.

### 3 Results

The results of the OLS analysis are summarized in Table 2.

Because of the large sample size, most of the effects were significant, and we therefore focused on the findings with the largest coefficients due to their expected practical significance.

The conception of *research as the discovery of truth* showed several significant effects, but the most notable was a negative association with a *society-driven* orientation ( $B = -0.114, p < 0.01$ ). A possible interpretation is that research focused on societal issues is likely to be more applied in nature and thus not directly related to the idea of research as a “truth-seeking” process, which may be considered more theoretical and abstract. However, this seems to stand in opposition to the focus on truth-seeking from a citizen science perspective, where non-professionals participate in scientific research with a “truth-seeking” purpose and focus on a mix of applied societal and scientific challenges (Wynn, 2017). The dimension *misconceptions about research* also showed several interesting effects, with high scores on this dimension associated with a high level of *mentor influence* ( $B = 0.277, p < 0.01$ ), increased *tolerance of low funding* ( $B = 0.078, p < 0.01$ ), and a higher orientation toward an *academia-driven* ( $B = 0.165, p < 0.01$ ) and *society-driven* ( $B = 0.150, p < 0.01$ ) approach. The link with *mentor influence* suggests that a researcher following a specific approach may feel more confident with the presence of a mentor, who provides a sort of guarantee that the chosen approach is valid.



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Table 2. Effects of conceptions of research on research agenda setting.

	Ambition	Divergence	Collab	Mentor	TTLF	Discovery	Academia	Society
Truth	0.069*** (0.011)	-0.034*** (0.011)	-0.008 (0.010)	0.021 (0.017)	-0.025 (0.016)	0.048*** (0.011)	-0.026** (0.012)	-0.114*** (0.013)
Misconceptions	0.056*** (0.013)	0.014 (0.013)	-0.026** (0.012)	0.277*** (0.020)	0.078*** (0.019)	-0.040*** (0.013)	0.165*** (0.014)	0.150*** (0.015)
Problem-solving	0.064*** (0.016)	0.157*** (0.016)	0.127*** (0.015)	0.034 (0.025)	-0.044* (0.024)	0.068*** (0.016)	0.113*** (0.018)	0.310*** (0.019)
Re-research	0.104*** (0.016)	0.025 (0.016)	0.029** (0.014)	0.087*** (0.024)	0.017 (0.023)	-0.020 (0.016)	0.085*** (0.017)	0.030* (0.018)
Insightful process	0.258*** (0.021)	0.118*** (0.021)	0.241*** (0.019)	-0.127*** (0.032)	0.085*** (0.030)	0.312*** (0.021)	-0.030 (0.023)	-0.060** (0.024)
Gender (Male)	0.091*** (0.022)	-0.010 (0.022)	0.030 (0.019)	0.034 (0.033)	0.237*** (0.032)	0.101*** (0.022)	-0.172*** (0.024)	-0.121*** (0.025)
Age	-0.020*** (0.002)	-0.007*** (0.002)	-0.002* (0.001)	-0.006** (0.002)	0.022*** (0.002)	0.001 (0.002)	0.000 (0.002)	0.016*** (0.002)
Time since PhD	0.010*** (0.002)	-0.002 (0.002)	0.004*** (0.001)	-0.024*** (0.002)	-0.005** (0.002)	0.005*** (0.002)	-0.016*** (0.002)	-0.021*** (0.002)
Research universities (top 500)	0.046* (0.026)	0.020 (0.026)	0.009 (0.023)	0.031 (0.039)	-0.053 (0.037)	0.054** (0.026)	-0.134*** (0.028)	-0.080*** (0.030)
FOS (Engineering and Technology)	-0.034 (0.028)	0.157*** (0.029)	-0.078*** (0.025)	0.021 (0.043)	0.046 (0.041)	0.129*** (0.029)	0.072** (0.031)	0.444*** (0.032)
FOS (Medical and Health sciences)	0.075*** (0.028)	0.082*** (0.028)	0.140*** (0.025)	0.142*** (0.043)	-0.120*** (0.041)	0.015 (0.028)	0.154*** (0.031)	0.389*** (0.032)
FOS (Social sciences)	0.089*** (0.028)	-0.061** (0.028)	-0.010 (0.025)	-0.002 (0.043)	0.488*** (0.041)	0.067** (0.028)	-0.172*** (0.031)	0.628*** (0.032)
FOS (Humanities)	0.119** (0.059)	0.044 (0.060)	-0.229*** (0.053)	-0.231** (0.090)	0.743*** (0.086)	0.245*** (0.060)	-0.355*** (0.064)	0.398*** (0.068)
Career internationalization	0.098*** (0.024)	0.087*** (0.024)	0.017 (0.022)	-0.136*** (0.037)	0.107*** (0.035)	0.137*** (0.024)	0.003 (0.026)	-0.074*** (0.028)
Country controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,554	8,555	8,554	7,920	8,551	8,554	8,554	8,551
R-squared	0.147	0.079	0.108	0.172	0.103	0.089	0.163	0.206

Notes: Standard errors in parentheses. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1





A researcher's misconception about research may derive from socialization with the mentor during the doctoral studies. The same rationale holds for the association of *misconceptions about research* and the academia-driven dimension of the MDRAI-R. A researcher may feel confident about a specific research approach or conceptualization if he or she perceives that this research process is supported, accepted, or promoted institutionally, such as by a scientific community, university, or industrial research laboratory, as these organizations' backing confer legitimacy on one's actions and may be perceived by the researcher as holding the ultimate responsibility (Milgram, 1974). The association with low available funding may reflect the researcher's difficulties in obtaining research funds if the research approach is considered flawed by research funding agencies. Finally, engaging with peers outside academia through collaboration with laypersons may increase a researcher's confidence that their research process will achieve successful results because the researcher assumes the role of an expert who is in control of the research process (this may be the case even if the conceptualization or methods are flawed but the researcher believes they are sound; Gorman & Gorman, 2017).

The conception of research as *problem-solving* had positive associations with *divergence* ( $B = 0.157, p < 0.01$ ), *collaboration* ( $B = 0.127, p < 0.01$ ), and *academia-driven* ( $B = 0.113, p < 0.01$ ) and *society-driven* ( $B = 0.310, p < 0.01$ ) approaches. These results are consistent with the expectation that *problem-solving* implies a need to engage in multidisciplinary and collaborative research processes that are aligned with the field and, more specifically, with institutional policies and incentives, and are focused on "real-life" problems that involve the participation of non-experts in the research process (Lyll, 2019). Conceiving of research as *re-research* shows a number of weaker effects, the most notable of which were on *scientific ambition* ( $B = 0.104, p < 0.01$ ), *mentor influence* ( $B = 0.087, p < 0.01$ ), and *academia-driven* ( $B = 0.085, p < 0.01$ ), and *society-driven* ( $B = 0.030, p < 0.1$ ) approaches. The association with *scientific ambition* can be explained by the need to assess the findings of others and drive them forward, thus reinforcing one's field position within what Kuhn (2012) calls "normal science," or attempting to create a disruptive paradigm. Both are known to be pathways to authority within a field and to career success in research. The influence of the mentor and orientation toward academia-driven dimensions may be associated with research agendas that revisit research work, and the orientation toward society-driven work might indicate a need to reassess and update past findings as societal challenges and knowledge evolve at different paces. Viewing *research as an insightful process* showed notable positive associations with *scientific ambition* ( $B = 0.258, p < 0.01$ ), *collaboration* ( $B = 0.241, p < 0.01$ ), and *discovery* ( $B = 0.312, p < 0.01$ ), with an additional negative association with *mentor influence* ( $B = -0.127, p < 0.01$ ). These results stress the





continuous struggle to find new perspectives that can lead to knowledge breakthroughs in specific topics and indicate that this struggle demands determination (associated with scientific ambition), collaboration to deal with the complexities of science, and risk-taking attitudes rather than conformity (Santos & Horta, 2019a). Finally, it is relevant to note that all of the dimensions of the CoRI showed statistically significant and positive associations with one MDRAI-R dimension: scientific ambition. This means that no matter which conceptualizations of research one believes in—and some researchers' beliefs may include an overlap of several, even if one is dominant (Brew, 2001)—striving for scientific recognition and authority in one's field continues to be a key objective of most researchers. This finding underlines the strongly rooted Foucauldian and Mertonian dynamics in contemporary science systems (Stehr & Grundmann, 2011).

Some interesting findings were made in relation to the control variables. When strategizing on research agendas, *scientific ambition*, *discovery*, and *tolerance for low funding* played a greater role for male researchers, while female researchers paid more attention to environmental factors such as *academia-driven* and *society-driven* approaches. These findings align with expectations based on the literature that male and female researchers face different institutional and organizational constraints on their work, which affect their thinking and beliefs about research practices, aims, and productivity, ultimately undermining female researchers from attaining intellectual leadership roles in epistemic communities (Oleksiyenko & Ruan, 2019). Female and male researchers also differ in terms of research preferences and work strategies, as female researchers tend to be more focused on issues of social innovation and knowledge exchange and are more likely to abide by institutional norms and values, whereas male researchers assume a more individualistic approach and are more career-focused and interested in establishing themselves in scientific communities as leading scientists (Ramos et al., 2015). Time since completing the PhD was more relevant than age to the development of research agendas, highlighting the growing importance of professional age in research endeavors compared with life age (Gaughan, 2009). This is further reinforced by the fact that the findings concerning these two variables differed substantially, perhaps because researchers' careers are increasingly nonlinear and diverse in terms of time of entry into the career (Jaeger et al., 2017). For example, older researchers may be less ambitious in their research agendas ( $B = -0.020$ ,  $p < 0.01$ ), but the more professional experience a researcher has, the more ambitious their research agenda will be ( $B = 0.010$ ,  $p < 0.01$ ). Those working in the most prestigious universities were more focused on potentially disruptive research processes and more willing to drive forward ambitious research agendas ( $B = 0.046$ ,  $p < 0.01$ ), and they placed considerably less importance on academic ( $B = -0.134$ ,  $p < 0.01$ ) and societal factors ( $B = -0.080$ ,  $p < 0.01$ ) when strategizing on their



research agendas. These results suggest that researchers at research universities, perhaps because of their high scientific potential and strong research profiles, are more engaged with their own agendas (and have the power to resist external pressures and pursue them) than researchers working in less research-oriented universities, who may find themselves with few options other than to follow field community and institutional guidelines and to align their behaviors and beliefs accordingly (Ursin et al., 2020). Finally, researchers who are internationally mobile tend to be more ambitious ( $B = 0.098$ ,  $p < 0.01$ ) and divergent ( $B = 0.087$ ,  $p < 0.01$ ), more likely to pursue potentially disruptive research ( $B = 0.137$ ,  $p < 0.01$ ), and more willing to engage in research even with limited funding ( $B = 0.107$ ,  $p < 0.01$ ). They are also less influenced by their mentors ( $B = -0.136$ ,  $p < 0.01$ ) and less prone to shape their research to be society-driven ( $B = -0.074$ ,  $p < 0.01$ ). These results align with findings that internationally mobile researchers are more independent, disruptive, and ambitious but are not as engaged with societal research issues (which may partly be due to language, cultural, and other barriers to collaborating with local laymen or understanding localized societal challenges), and that they are not dependent on mentor influences, which may decrease or be lost due to the mobility process (Huang, Daizen, & Kim, 2019; Kuzhabekova & Lee, 2020).

#### 4 Conclusion

This study suggests a close association between the conceptions of research that researchers hold and their approach to setting their research agendas. The findings indicate that research conceptions are particularly associated with five dimensions of the research agenda strategy: *scientific ambition*, *collaboration*, *discovery*, *academia-driven approach*, and *society-driven approach*. Other dimensions influencing research agendas were also associated with research conceptualizations, but to a lesser extent. Only *scientific ambition* had positive associations with all conceptions of research, indicating that variety of ways of thinking about the meaning of research all lead to research agendas with an underlying focus on gaining scientific recognition, prestige, and authority in a given scientific field. This suggests that scientific ambition, the positional goods associated with it (e.g. prestige, one of the most sought-after commodities in science and academia; Coate & Howson, 2016), and material rewards (e.g. the “cumulative advantage” hypothesis; Kwiek, 2016) continue to be major drivers for researchers within the social stratification that characterizes the current global scientific social system (Kwiek, 2019). This is the case regardless of whether researchers have a dominant conceptualization of research among an overlap of several or a single definite conceptualization of research (Brew, 2001).



*Collaboration* had a positive association with almost all of the research conceptualization dimensions (non-statistical significance with *research as the discovery of truth*). The only negative association was with the concept of *misconceptions about research*, which can be explained by the fact that it is difficult for a researcher with these misconceptions to collaborate with others, and such a researcher is unlikely to be invited to collaborate on research projects and agendas set by others. There are two main reasons for this. First, *misconceptions of research* underlines the preconceived ideas that a researcher brings to the research process, which undermine the researcher's expected neutrality and impartiality concerning a research object. Starting a research project with such preconceived ideas is more akin to a political or opinionated view about a research object than to a more ethically neutral research inquiry. Researcher biases are known to jeopardize the trustworthiness and the credibility of the research process and are therefore not acceptable to most of the research community (Jorgensen, et al., 2016; Joseph & Baldwin, 2000). Researchers' biases also raise ethical research issues, lead to pseudo-scientific findings, and are sometimes related to politically and economically sponsored research, which has caused substantial damage to the image of science, research, and researchers (Nestle, 2016). Second, two of the items of the *misconceptions about research* dimension, i.e. "If followed correctly, research procedures will always yield positive results" and "for an activity to be called 'research,' it must involve experimentation," highlight a somewhat positivistic but highly rigid view of research processes that would exclude specific types of quantitative research and all qualitative research. This is not attuned with the evolution of contemporary research towards multidisciplinary, the use of multiple theoretical and methodological paradigms, and nuanced forms of engaging in research processes while following legitimized values and norms of research conduct by relevant scientific communities (Corry, Porter, & McKenna, 2019).

Similar to collaboration, almost all of the conceptions of research have statistically significant associations with discovery—that is, one's willingness to research topics that are riskier but have greater impact potential (no statistical significance was found with *research viewed as re-search*). In the same vein as collaboration, all of the associations are positively associated with discovery except *misconceptions about research*. For the reasons mentioned above, this is expected because if one begins research with a preconceived idea, the findings are likely to conform to an initial expectation about what the results will be. Furthermore, even if the purpose of the research is to achieve breakthroughs and innovative thinking, the theoretical and methodological rigidity associated with a high score on *misconceptions about research* will prevent major findings, as such rigidity is not attuned to the conceptual, methodological, and analytical needs of contemporary science and research breakthroughs (Nairn, 2019).



The relationship between the dimensions of the CoRI and academia-driven approach is statistically significant in all dimensions except *research as an insightful process*. The statistically significant associations are positive except the association with *research as the discovery of truth*, which is negative. This may be related to the attitudes of researchers who hold this conception of research (e.g. presenting research impersonally, as if the researcher was not part of the research process; Brew, 2001), which makes them less influenced by institutional pressures and directives from the scientific community and the organization where they work. Contrarily, researchers more influenced by other conceptualizations of research may feel more motivated by institutionally driven pressures and rewards (such as engaging in participatory research that universities push as part of their research and service missions) and more supported in their research activities (even if they are based on misconceptions). The different signs of the statistical effects concerning academia (including the non-significance of one conception) may point toward tension between the research agenda being driven by researchers' own interests and the matter of personal choice (Kuhn, 2012) and the need to adapt, conform, and adjust research agendas in the face of disciplinary, national, and institutional policies and incentives (Horta & Santos, 2020).

Finally, *society-driven* agendas were positively associated with *misconceptions about research*, which might reflect the role of the researcher as an expert in a power relation with non-expert laypersons even when the researcher's expertise is based on potentially biased scientific premises and beliefs. *Society-driven* agendas were also positively associated with *problem-solving*, which reflects the interaction with communities enabling researchers to contribute to solving particular social challenges, and with *re-research*, which reflects the need to constantly revisit societal challenges as they and the knowledge base co-evolve. However, perhaps related to the more applied nature of *society-driven* research, there were negative associations between *society-driven* research and both *research as the discovery of truth* and *research as an insightful process*. The explanation for these negative associations may involve the positioning of the researcher as one almost absent from awareness and simultaneously involved in a cognitive process focused more on understanding than on providing an applied solution for a specific problem (Brew, 2001). Such research may have relatively low academic interest (not challenging enough for example) despite its practical importance for the community. This is consistent with the "layer conception" proposed by Brew (2001), in which the researcher is interested and concerned with uncovering what lies beneath the reality and through this discovery process eventually provides a better explanation or creates a new paradigm for explaining this reality (Brew et al., 2016). This reflective, abstract, and theoretically driven type of research conception is not consonant with more applied research or with collaborative engagement with laypeople.



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## Author contributions

Both authors contributed equally to this work.

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## Appendix 1

### Conceptions of Research Inventory (CORI)

In this section, you will be asked a series of questions about your beliefs regarding research. How much do you agree with the following statements?

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	N/A
Solving1	The main purpose of research is to identify problems that need to be solved.						
Truth1	Research is fundamentally about finding out the truth.						
Misc3	Research is about collecting data back your argument.						
Misc1	If followed correctly, research procedures will always yield positive results.						
Insight3	Research extends current concepts to obtain a deeper understanding.						
Re1	Research means looking for what previous research has failed to uncover.						
Solving3	Research is about finding solutions to problems.						
Re3	Research is a systematic investigation to find out if there are facts that were left out by previous researchers.						
Insight1	Research means an in-depth study of a particular topic.						
Truth3	Research is done in order to determine the truth about something.						
Re4	Research means finding out more information about something previously researched.						
Re2	Research is there to challenge research that has been done before.						
Misc2	Good research specifically gathers data that will support the researcher's preconceived ideas.						
Insight4	In answering or understanding something, new ideas present themselves for further investigation.						
Insight2	Research stimulates further interest or work in a particular topic.						
Truth2	Research is about revealing the truth.						
Misc4	For some activity to be called "research" it must involve experimentation.						
Solving4	Research means collecting data to help solve a particular problem.						
Truth4	Research is a process for establishing what is true about something.						
Solving2	Research is basically about solving problems.						



## **Appendix 2**

### **Multi-Dimensional Research Agendas Inventory – Revised (MDRAI-R)**

You will be asked a series of questions regarding your motivations and goals as an academic. Please read and determine your level of agreement with each statement. Then, check one of the seven boxes next to the corresponding item. If you do not know or if a particular sentence does not apply to you, check the N/A box.

Some questions will ask about your field, and others will ask about your research topics. Please consider “field” to be the main theme of your research (for example, “higher education”), and “research topic” as a specific subject within the main theme (e.g. “doctoral education” and “access to higher education” would be research topics in the “higher education” theme). “Field community,” another term that you will encounter while completing the survey, is defined as the research/scholarly communities with which you identify. Please keep these definitions in mind when you respond to the questions.

There are no right or wrong answers. Please read each statement and check the box that best applies to you. How much do you agree with the following statements?



		Completely disagree	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Completely agree	N/A
A1	I aim to one day be one of the most respected experts in my field.								
A2	Being a highly regarded expert is one of my career goals.								
A3	I aim to be recognized by my peers.								
A5	I feel the need to constantly publish new and interesting papers.								
A6	I am constantly striving to publish new papers.								
A7	I am driven to publish papers.								
DV1	I look forward to diversifying into other fields.								
DV2	I would be interested in pursuing research in other fields.								
DV4	I would like to publish in different fields.								
DV5	I enjoy multi-disciplinary research more than single-disciplinary research.								
DV6	Multi-disciplinary research is more interesting than single-disciplinary research.								
DV8	I prefer to work with multi-disciplinary rather than single-disciplinary teams.								
COL2	My publications are enhanced by collaboration with other authors.								
COL4	I often seek peers with whom I can collaborate on publications.								
COL5	I enjoy conducting collaborative research with my peers.								
COL7	My peers often seek to collaborate with me in their publications.								
COL8	I am often invited to collaborate with my peers.								
COL12	I am frequently invited to participate in research collaborations due to my reputation.								
M2	Part of my work is largely due to my PhD mentor.								
M3	My research choices are highly influenced by my PhD mentor's opinion.								
M4	My PhD mentor is responsible for a large part of my work.								
M6	My PhD mentor largely determines my research topics.								



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		Completely disagree	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Completely agree	N/A
TTLF1	Limited funding does not constrain my choice of topic.								
TTLF2	Highly limited funding does not constrain my choice of topic.								
TTLF3	The availability of research funding for a certain topic does not influence my decision to conduct research on that topic.								
TTLF4	I am not discouraged by the lack of funding on a certain topic.								
D2	I would rather conduct revolutionary research with little chance of success than replicate research with a high probability of success.								
D3	I prefer “innovative” research to “safe” research, even when the odds of success are much lower.								
D4	I would rather engage in new research endeavors, even when success is unlikely, than safe research that contributes little to the field.								
D9	I am driven by innovative research.								
O1	My choice of topics is determined by my field community.								
O9	I often decide my research agenda in collaboration with my field community.								
O6	I adjust my research agenda based on my institution’s demands.								
O7	My research agenda is aligned with my institution’s research strategies.								
S1	I decide my research topic based on societal challenges.								
S4	Societal challenges drive my research choices.								
S5	I often strive to engage in issues that address societal challenges.								
S2	I choose my research topics based on my interactions with my non-academic peers.								
S3	I consider my research topics myself, but this consideration often occurs after I hear what my non-academic peers have to say about these topics.								
S6	I consider the opinions of my non-academic peers when I choose my research topics.								