Are the strategic research agendas of researchers in the social sciences determinants of research productivity?

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Abstract

This study analyzes the association between the strategic research agendas of researchers in the social sciences and their research performance. Based on a worldwide sample of 604 researchers, this study assesses whether researchers' strategic research agendas are predictors of both short-term (last 3 years) and long-term career publications and citations, after controlling for relevant literature-informed determinants of research productivity. The results show that, in a short-term perspective, research agendas have a limited association with productivity and visibility. Solely the research agendas strategically oriented towards publishing and those collaborative in nature have positive associations with research productivity and visibility. This changes when a long-term perspective is considered. Over the course of a career, research agendas are significantly associated with number of publications and citations. Research agendas oriented towards publishing and collaboration, and those focused on a single field of knowledge, prestige gain and discovery have a positive effect on career research performance, while those research agendas that are overspecialized, dispersed over several fields of knowledge and topics, and influenced by a mentor have opposite associations. This study also finds that prolific research productivity shapes one's strategic research agenda: the more one publishes, the more one is bound to have a strategic research agenda that is focused on prestige, discovery, a further drive to publish, engagement in a multitude of topics to research, and pursuing multidisciplinary and collaborative research. This effect is driven by an accumulation of publications, not citations. These findings highlight how strategic research choices interact with the individual performance of researchers in the social sciences in performativity-oriented research landscapes.

Keywords: Social Sciences; higher education studies; research productivity; strategic research agendas

Introduction

Research productivity is a central topic of interest in current research systems, for countries, organizations but also for researchers given current "publish or perish" dynamics (e.g., Backes-Gellner and Schlinghoff, 2010). As institutions and policies demand more and better research performance, evaluation frameworks put an ever increasing pressure on individual researchers (Martin 2011). This pressure is particularly impactful for researchers in the social sciences (Gao and Zheng 2020), a group for which studies on the determinants of research productivity have been lacking (Vuong et al. 2019). A better understanding of the determinants of research productivity in the social sciences matters because current innovation and knowledge development challenges require multidisciplinary and complex approaches, where social science research may play a pivotal role (Symes and Hoefnagel 2010). Yet social science researchers are not in a comfortable position as they continuously manage tensions between national research focused communities dominated by national languages and specific interests, and the need to publish in English for international audiences (Nederhof 2006). They are also a community that resists emphasizing publications in indexed international peer-refereed journals but are publishing more in these journals and more in collaboration with peers abroad due to incentives that governments and universities are driving forward (Akbaritabar et al. 2018).

Albeit in research and publication conundrums, social science researchers are exposed to the same scientific environment that other sciences are, and their research performance is bound to be influenced by the same determinants of research productivity that are of relevance to the other sciences. These determinants include gender (e.g., Mayer and Rathmann 2018), age (e.g., Baccini et al. 2014), career stage and rank (Sabharwal 2013), publications during the Ph.D. (e.g., Horta and Santos 2015), collaborations (e.g., Levitt and Thelwall 2016), mobilities (e.g., Horta et al. 2020), funding amount and funding sources (Lee 2020) but also the role of accumulative advantage effects (Allison et al. 1982; Allison and Stewart 1974; Merton 1968) and the influence of organizational characteristics, missions and incentive frameworks (Fox and Nikivincze 2020; Jørgensen and Hanssen 2018). Knowledge about these determinants led to national and institutional policies directed to increase research performance at research institutions (McGrail et al. 2006). Yet, despite numerous studies focused on predictors of research productivity and visibility, there is one that has been overlooked, the researcher's strategic research agenda.

The researchers' strategic research agendas are high-level strategies to be later pursued by low-level actions (Ertmer and Glazewski 2014). They are an under-explored phenomenon in research processes, possibly because in most fields of knowledge the research agenda is largely understood as a taken-for-granted commonality. Only recently a study developed a framework that identified several levels of researcher strategic research agenda (Horta and Santos 2016b), leading to a subsequent finding that these agendas differ significantly among researchers (Santos and Horta 2018). It was also found that in some fields of knowledge, strategic research agendas are pursued with the specific intent of advancing a researcher's career regardless of contribution to the field (Rzhetsky et al. 2015). Due of this, it becomes important to understand whether pursuing specific agendas effectively impacts research performance, since the latter is associated with career advancement and benefits (Kwiek 2018). In this study, we explore the question: are the strategic research agendas of researchers in the social sciences associated with their research performance? In the analysis, the Multi-Dimensional Research Agendas Inventory (MDRAI) is used to characterize the research agendas of researchers in the field of Higher Education, a social sciences sub-field which is contributed to by researchers from all disciplinary areas of the social sciences (Tight 2015). The analysis starts by examining the extent to which

researchers' publication and citation count is associated with the shaping of their strategic research agendas, using the MDRAI dimensions and further control variables. This precursor analysis is necessary because research agendas are socially construed as part of the research process (Santos and Horta 2018), and as such they may be informed and influenced by the research profile that researchers build along their careers (see Merton 1973). The main analysis is then conducted to respond to the research question. The scores for the MDRAI dimensions are regressed on the researchers' publication and citation count, along with several controls, with the goal of determining whether specific agendas are significant predictors of research productivity and visibility.

The remainder of this paper is structured as follows. In the second section, a brief literature review is conducted, with an emphasis on presenting the strategic research agenda framework used. The subsequent section explains the data and methods, followed by a presentation of the results. The final section concludes the paper.

Literature review

Determinants of individual research productivity

The conceptualization of the determinants of individual research productivity is largely grounded in the theory of the normative structure of science (Merton 1973). This theory states that research is a social institution, following an ethos and a few pivotal norms that govern the actions of researchers. These norms are universalism, communism, disinterestedness, and organized skepticism (see Merton 1973). As a social institution, there are several rewards to be gained by those who best meet the premises of these norms, but as resources are limited and talent is difficult to observe directly, three assumptions emerge in this theory. The first assumption is that the research output and visibility of researchers becomes a proxy for their ability to produce research and for the recognition that such research may warrant among peers (Reskin 1977). The second assumption is that research productivity in all fields of knowledge tends to be highly skewed, as few researchers are able to publish quickly, secure resources, and establish their own research paradigms as legitimate and able to guide the research of others (Lotka 1926). The third assumption, related to the second assumption, is that a virtuous continuous cycle can be created in which the more one publishes, the more one is able to obtain resources that enable one to further increase one's number of publications and subsequent resources (i.e., the Mathew effect). This is defined as the accumulation advantage hypothesis, which combines the self-reinforcement of resources and reputation, a positional good sought by researchers to establish themselves in the scientific community (Merton 1968). The accumulation advantage hypothesis explains research productivity differences by stating that some researchers become more productive and recognized than others because they accumulate tangible (e.g., funding) and intangible (e.g., reputation) resources faster, giving them a growing advantage that accumulates over time. The desire for peer recognition and interest in science also underline the motivation behind the "sacred spark" hypothesis developed by Cole and Cole (1973). However, the sacred spark hypothesis emphasizes the inner motivation for researchers' research (intrinsic rewards) and minimizes the role of extrinsic motivation (external rewards). The sacred spark hypothesis explains research productivity differentials by asserting that some researchers produce more research than others because they are more motivated and possess an inherent ability (or "gift") to do research. Empirical studies tend to lend greater

credence to the accumulation advantage hypothesis, without dismissing the role of the sacred spark hypothesis (Allison and Stewart 1974).

The theories above expose the effort of researchers, who also have different research productivities based on ascribed and behavioral characteristics. Analyses of gender and age reveal that these characteristics influence engagement in research activities and are relevant explanatory factors of research productivity (e.g., Aiston and Jung 2015). Other analyses assess professional and educational paths, as well as other characteristics of relevance (e.g., Yang and Webber 2015). Such analyses highlight the role of environmental theories that pertain to the influence that the work environment and the tangible and intangible resources associated with the workplace can have in terms of helping or hindering individual researchers' achievement of prolific research productivity. A university's reputation, mission statement, and work environment play key roles in the research productivity of individual researchers (e.g., Allison and Long 1990). Environmental theory highlights the current conditions in which research tends to occur, more associated with the effort of a team or group within an organization or across organizations, and increasingly less dependent on a single researcher, doing research in isolation (Fox and Nikivincze 2020). The connection between the individual and environmental factors that influence the research productivity of researchers leads this study to be broadly guided by social cognitive theory, as it contends that human behavior and actions are co-determined by personal (e.g., cognitive, affective, and biological events), behavioral (e.g., self-efficacy), and environmental factors (Bandura 1978). By adopting the overarching guidance of social cognitive theory, the relevance of the accumulation and sacred spark hypotheses and the environmental theories to the phenomena under study can be determined. Doing so also allows for the determinants of individual research productivity emerging in the literature to be conceptually categorized into demographic, psychological, antecedent, and organizational factors.

Demographic factors

Gender. Various studies have shown that there is a gender gap in research productivity: female academics tend to publish less than their male counterparts (e.g., Lone & Hussain, 2017), even if in the humanities and social sciences, where females are more represented (Kim and Kim 2017). The literature has often attributed the gender gap to women's role in family responsibilities, such as marriage and parenting, which occupy their time for research and thus make them less productive (e.g, Beddoes and Pawley 2014). Recent studies tend to contradict these findings providing evidence that women's role in the family does not negatively affect research productivity in all cases, arguing instead that gender productivity differentials are much more likely the result of systemic and structural discriminatory practices that female researchers face in the research institutions where they work (Aiston and Jung 2015). The gender research gap appears to have become attenuated since recent studies demonstrated that this gap in research productivity is increasingly marginal, and females in some cases even outperform males in both publication (Frandsen et al., 2015, 2020) and citation rates (Liu et al. 2020; Nielsen 2016).

Age. Several studies suggest that there is roughly an inverted U-shaped relationship between age and research productivity, but this is a pattern that varies among disciplines. Rørstad and Aksnes (2015) findings revealed an inverted U-shaped publication pattern concerning Engineering and Technology researchers while researchers in the humanities and social sciences did not show this pattern. For the latter, the age-publication curve was multimodal in the

humanities, while the growth rate in social sciences was slower than that in the hard sciences. Similarly, Diem and Wolter (2013) found that the publication curve of researchers in the field of education primarily exhibited a positive curvilinear pattern. Shin and Cummings (2010) further distinguished between effects of biological age and academic age (i.e. years since obtaining a doctorate) on research output. They found that the former effect was negative, while the latter was generally positive and possibly the result of accumulated experience and networking. Age and academic age (as well as rank) tend to be highly correlated and often only one is used, to avoid multicollinearity issues (Abramo et al. 2018). The different findings concerning this variable underline an indirect criticism of the premises of the accumulative advantage hypothesis. Specifically, unlike the expected linear and continuous accumulation advantage dynamics that focus on knowledge production proposed by this conceptual framework, after a certain age, researchers may attain a degree of achievement whereby the number of publications and citations yields diminishing returns. These researchers may then allocate their effort and attention to prestigious positions or work that yield financial rewards instead of furthering their research productivity (Mittermeir and Knorr 1979).

Psychological factors

Self-efficacy. Psychological factors were also explored concerning research productivity, with a focus on two main aspects. First, based on Bandura's (1978) social cognition theory, scholars attempted to evaluate the association between research self-efficacy (i.e. the individual's self-confidence in their ability to successfully conduct research) and research performance. Empirical evidence showed that self-efficacy was a significant predictor of doctoral students' research success but the strength of correlation among faculty members was weak (Kozhakhmet et al. 2020; Pasupathy and Siwatu 2014). Second, the sacred spark hypothesis contends that prolific academics tend to be "motivated by an inner drive to do science and by a sheer love of the work" (Cole and Cole 1973: 62) rather than by external rewards. This hypothesis highlights the role of motivation in deciding individuals' research productivity, as it may differentiate researchers' research practices and strategic options. Yet, empirical findings so far are mixed. Horodnic and Zaiţ (2015) showed that intrinsic motivation boosted research productivity, while extrinsic motivation had a negative impact. Contrarily, Tien (2000) established that researchers who gave high priority to the promotion and the satisfaction of curiosity tended to publish research articles rather than other types of research outputs. Finally, Chen et al. (2006) proposed that the portfolio of different motivations can exert an influence on the type of research output.

Antecedent factors

The emergence of antecedent factors has characterized recent studies on research productivity. Yet, results have been mixed possibly because antecedents are partly endogenous.

Ph.D. related factors. The doctoral experience and related events have received attention in the research productivity literature, as the doctorate is focused on research and on the socialization towards participation and integration into scientific communities. Kim and Kim (2017) showed that if Ph.D. holders were older when awarded the doctorate or spent longer spans of time to complete a Ph.D. degree, they were inclined to have worse research productivity later on. Researchers which had their PhDs supported by competitive funding sources produced more publications during career than those without any funding (Horta et al. 2018). Being trained in research groups with funding for Ph.D. research was also associated with higher academic performance after graduation (Broström 2019). In addition, publishing during the Ph.D. was found to be a determinant of career research productivity (Horta & Santos, 2016a). Horta and

Santos (2016a) demonstrated that early career researchers could develop scientific autonomy and networking skills through publishing during the doctorate, possibly explaining why their career research performance and collaboration were better than those who did not commence publishing until Ph.D. graduation. The fact is that early publication record is a predictor of later research success (Fu et al. 2020). Having a post-doctoral position after Ph.D. completion is also found to be a predictor of research output (Yang and Webber 2015).

Mobility. Many studies examined the influence of mobility, especially transnational mobility, and job mobility on research productivity, offering mostly mixed results. Horta et al. (2018) found that some forms of mobility fostered research productivity to some degree, whilst other forms of mobility did not. Other recent studies found no evidence that overseas Ph.D. experiences rewarded researchers with higher research productivity, and returnee PhDs in some disciplines were even less productive than domestic degree holders (e.g., Singh 2018). Shin et al. (2014) suggested that the boom of foreign Ph.D. holders and research evaluation systems increasingly encouraging international collaboration helped to mitigate the impact of overseas mobility on research productivity. In the job mobility literature, some attention has been paid on academic inbreeding and revealed that immobile researchers tend to be less productive. However, recent studies have shown that for researchers in the fields of social sciences and humanities, this may not be the case (Smyth and Mishra 2014; Tavares et al. 2019). Similarly, Bäker (2015) identified a short-term negative impact of intra-sectoral job mobility on research output, which the author inferred was due to the reduction of social capital resulting from leaving the former institution. This finding is aligned with findings reporting that job mobility could prompt research output, but only rewarding high-productivity researchers (e.g., Bolli and Schläpfer 2015). The differences found in these studies may be related to the fact that mobility is moderated by several factors such as gender, seniority, and discipline, among others (Horta et al. 2019).

Collaborations. The effect of research collaboration on research productivity has been often studied. Rodriguez Miramontes and Gonzalez-Brambila (2016) used structure holes theory to show that both structural holes and density could result in a significant increase in publications. Most of the literature has pointed out that international collaborations could facilitate one's research output, especially for low-performing researchers (e.g., Vuong et al. 2019). Similar results have been obtained when international collaborations were measured by the frequency of co-authoring with international scholars and by whether one had a stable group of international co-authors (Akbaritabar et al. 2018). Conversely, Abramo et al. (2017) demonstrated that only domestic academic collaboration brought about an increase in research productivity, whilst international collaboration did not, partly due to its high transaction costs. In the literature on intra-organization collaboration, several studies have paid attention to peer effects. For instance, Agrawal et al. (2017) found that while the introduction of a new star scientist was likely to increase the number of publications of incumbents who could directly collaborate with the star, it had a potential threat to that of unrelated incumbents. As to why academic collaboration could prompt individual research productivity, Abramo et al. (2017) summarized five possible factors: through complementary competencies, through access to unique or costly resources, through more efficient use of time, through enhanced publication motivation, and through reputation gained in collaboration.

Organizational factors

Working environment. Several studies have examined the effects of the working environment on individual research productivity. Earlier studies mainly focused on the influence of

department size and organization prestige, and found that individual academic publications increase with department size (Jordan et al. 1989). Working at a prestigious department is associated with a higher research output (Allison and Long 1990). Recent research focus has gradually switched to the influence of organization climate. Positive department(/team) climate was found to be correlated to higher research productivity (Fox and Nikivincze 2020). Hedjazi and Behravan (2011) showed that communicating with colleagues, appropriate research facilities, and research objectives that were focused and clear would significantly and positively influence research productivity. Leadership was also of importance. Murayama et al. (2015) reported that team members would yield fewer publications if the managerial role was played by leading scientists. Furthermore, funding mechanisms and rewards may also exert a critical effect on individual research productivity. Some evidence shows that the introduction of performance-based research funding schemes improves the research performance of a country or university (e.g., Checchi et al. 2019). Qualitative evidence further shows that such funding schemes normally accompany a performance management reform within a university that consequently makes academics develop strategies to publish more (Mathies et al. 2020). However, pressure to publish can create working environments that become too stressful, that are overly competition driven, and where researchers feel a lack of autonomy, leading to research agendas that do not result in scientific breakthroughs but instead uphold the existing knowledge paradigm (Rzhetsky et al. 2015).

Teaching engagement. In the teaching-research nexus literature, some studies consider teaching as a competitive activity against research, especially in research environments where research performativity is dominant (Leišytė 2016). Yet, most studies have shown that teaching obligations had a positive or no significant impact on research productivity (Baccini et al. 2014; Jørgensen and Hanssen 2018), and balanced teaching research workloads could favor an increase in individual research output (Leišytė 2016). After distinguishing the level of teaching, it was found that teaching at the postgraduate level was positively related to research productivity (Horta et al. 2012), while this correlation became weaker or even negative in terms of undergraduate-level teaching (Diniz-Filho et al. 2016). The reasons for differences between levels of teaching may relate to the fact that only research-productive scholars can teach graduate courses in many cases, while graduate students' experience and level of participation in research activities are higher than that of undergraduates, which enables them to be regarded more as research assets than constrains. The majority of studies have found that administrative duties and bureaucracy were detrimental to individual research output also due to the scarcity of time (Lou et al. 2018).

Research productivity in the social sciences

Several studies have explored the determinants of individual research productivity, with the majority focused on STEM disciplines while few on the social sciences. Vuong et al. (2019) is one of these few studies. By analyzing the publication records of 406 Vietnamese social science researchers within a 10-year period, the authors found that being affiliated to universities (rather than research institutions) and collaborating internationally would positively impact the research productivity of social science researchers. Empirical evidence has suggested that some factors may be more relevant for individual research productivity in the social sciences compared to other fields. In terms of age, Piro et al. (2013) found that compared with researchers in other disciplines, social scientists remained productive for longer periods of time (up to 69 years old). As they grow older, social science researchers also tended to publish books or monographs (Sabharwal 2013). Relatedly, Mayer and Rathmann (2018) highlighted that

female social scientists had lesser interest to submit publications to competitive journals compared to their male counterparts. As regards institutional reputation, Kim and Kim (2017) showed that having been awarded undergraduate degrees from prestigious universities was associated with higher research productivity. Studies have also identified the less positive effects of international mobility for social scientists. Ph.D. returnees in the social sciences were found less productive than domestic degree holders at the beginning of their career (Shin et al. 2014; Singh, 2018) due to the disciplinary research focuses to develop localized research topics and adapting to the research environment in their home country.

The distinct pattern of knowledge production in the social sciences has often been cited to unpack the differential effects concerning research productivity (Najman and Hewitt 2003). Unlike STEM researchers who disseminate research findings mainly through journal articles, social scientists have long been accustomed to publishing books and book chapters as a way of knowledge diffusion (Nederhof 2006; Sabharwal 2013). This trend has been gradually changing with more weight placed on journal publication due to career advancement requirements and changing rewards and extrinsic motivations, than on books and book chapters even if these still account for a significantly higher proportion of the research output of social science researchers than that of STEM researchers (Piro et al. 2013). Some researchers propose to include book chapters and monographs when constructing performance measures for social scientists (Larivière et al. 2006; Piro et al. 2013), but in most publication indexed datasets the inclusion of books or book chapters is either omitted or incomplete. As to the relationship between the production of books and journal articles, through analysis of a sample of Flemish researchers in the humanities and social sciences, Verleysen and Ossenblok (2017) show that publication patterns varied substantially: some researchers in the field of social science were productive in both output forms, while others focused mainly on journal publications. Yet, as Pajić (2015) suggests, since a high proportion of social science studies are concerned with local topics and are not as attractive to international readers as STEM studies are, many social science researchers choose to publish most of their works in national journals, especially when based in non-English-speaking countries. This urges some caution when comparing the research productivity of social scientists across countries based on journal articles, but at the same time, the coverage of journal indexing services increasingly accounts for good national journals in languages other than English which mitigates such concerns (Vélez-Cuartas et al. 2016).

Method

Participants

The data gathering process was initiated with identifying corresponding authors of articles in higher education journals indexed in Scopus from the year of 2004 and until 2014. After the corresponding author's names and e-mails were collected, invitations to participate in an online survey were subsequently sent to these authors. The survey, which was conducted between May and November of 2015, contained socio-demographic questions and the MDRAI, a 35-item questionnaire which aims to evaluate research agendas on 8 dimensions and 12 sub-dimensions (Horta and Santos 2016b). The invitation to participate was accepted by 1,348 higher education researchers. Seventy-three of these responses were duplicates, probably due to the participants opening the link on different devices, and were excluded. An additional 10 participants were excluded due to lack of a valid Scopus Author ID, which is necessary for bibliometrics retrieval. Finally, 333 participants were excluded from the analysis due to failure to complete the survey

up to and including the MDRAI block. The final sample consisted of 932 participants. We decided that it was important to consider the field of knowledge of the respondents' Ph.D. as a control variable since not all social scientists begin their research careers as social scientists and many prominent social scientists started as natural scientists, such as Thomas Kuhn. However, because questions about education were optional in the questionnaire due to privacy concerns, many participants opted not to fill in this information, and the effective sample size was reduced to 604 participants. Considering the tradeoff between sample size and Ph.D. field of knowledge control, it was decided that controlling for the latter would provide more robustness than having an increased sample size. For the working sample, 316 (52.3%) of the participants were females and the remaining 288 (47.7%) were males. The age range was 29 to 83 years (M = 51.46, SD = 10.901). Regarding geographical distribution, the most represented countries were the United States (N = 161; 26.7%), Australia (N = 94; 15.6%), and the United Kingdom (N = 79; 13.1%), which is in line with the geographical distribution of Higher Education researchers (Kuzhabekova et al. 2015). Field of knowledge of the Ph.D. and country are used as fixed effects in the analysis but not shown in the tables to cater for table size.

Bibliometric data was also retrieved from Scopus for all the participants in the study but collected only in 2020 and having 2019 as the most recent year of the participant's publications. The purpose was to have publication data that was collected some years after the questionnaire was completed, so that the effects of the controls and the agendas had a temporal lag between the data collection from the questionnaire and the participant's research performance ever since. The whole of the publication data also informed the analysis included the publications and their received citations from the first indexed publication until the end of 2019.

Procedure and model specification

The precursor analysis concerns the effect of past publications and citations on research agendas and archetypes. This is the most conventional analysis. As such, simple ordinary least squares (OLS) regressions are used for the research agendas, and a logistic regression is used for the archetype (which is a dummy).

In the main analysis, as the dependent variables are bibliometric data, the nature of these variables as non-negative count data means that the choice of model is between Poisson or negative binomial (NB) regressions. As bibliometric data tends to be highly skewed leading to variance in excess of its mean, which constitutes a violation of the assumptions for Poisson regression (Gonzalez-Brambila and Veloso 2007), the NB model was used. The base model can be written as:

$$y_{ij} = \mu + \beta X_{ij} + \alpha_j$$

Where y_{ij} is a negative binomial; *i* identifies individual researchers and *j* a fixed effect. X_{ij} are variables that may vary across individuals and levels of the fixed effect, and α_j is the parameter for the fixed effect. The model further changes depending on the independent variables used for each analysis, which are described in the following sub-section.

Two distinct bibliometric analyses are conducted in the main analysis, each with four different models. In the first analysis, we evaluate the short-term effects of agendas on productivity and visibility, and as such the dependent variables are the publication and citation count after 2016 (2017 to 2019). Career publication and citation count (i.e, from the first publication until 2016

inclusive) is included in the models for control purposes. In the second analysis, we evaluate long-term effects, and as such, career totals are used instead. For both the short-term and long-term, two of the models regress the individual agendas on publications / citations, while the other two employ the agendas archetype instead of the individual agendas. The research agendas archetype is explained in the following sub-section.

Throughout the analysis, incidence rate ratios obtained from the NB model are expressed in terms of percentage change, with the goal of illustrating the magnitude of effect. Every time a given independent variable increases by one unit, the dependent value increases by the stated percentage (all other variables are held constant).

Variables

There are four dependent variables in the main analysis. *Publications* is the simple number of career publications as reported by Scopus, and *Citations* is the simple total of career citations also as reported by Scopus. These two variables are used for the long-term research productivity perspective. *Publications / Citations after 2016* refers only to more recent publications and citations obtained and relate to the short-term research productivity perspective. As the NB model only supports count dependent variables, the bibliometric variables are not field-normalized. Instead, disciplinary differences are controlled for by including the researchers' Ph.D. field of knowledge in the regression, as well as the publication field variables, which account for more specific sub-fields.

In the first two bibliometric analyses, the explanatory variables are the bottom-level MDRAI dimensions (Horta and Santos 2016b), which serve as the dependent variables in the precursor analysis. These dimensions are (with sample-specific Cronbach's alphas for the scale in parentheses) *Discovery* (α = 0.761), which relates to the desire to engage in innovative and ground-breaking research; *Branching Out* (α = 0.701), the preference for working in multiple fields of knowledge or topics; *Multidisciplinarity* (α = 0.878), the preference for multidisciplinary endeavors; *Mastery* (α = 0.601), the preference for mastering and operating in a single field or topic; *Stability* (α = 0.611), the preference for avoiding shifts in research interests; *Tolerance to Low Funding* (α = 0.800), the willingness to engage in topics with limited funding; *Prestige* (α = 0.868), the desire to obtain recognition and scientific capital; *Drive to Publish* (α = 0.809), the motivation and drive to publish research findings; *Willingness to Collaborate* (α = 0.882) and *Invited to Collaborate* (α = 0.897), the willingness and the opportunity to participate in collaborative research, respectively; *Mentor Influence* (α = 0.888), how much a researcher's Ph.D. influences their research strategy; and *Conservative* (α = 0.834), the preference for doing research in stable fields of knowledge or topics. All of these variables are continuous in nature and obtained by calculating the means of the dimensions obtained through Confirmatory Factor Analysis (DiStefano et al. 2009). In the third and fourth analysis, the independent variable is the cluster membership dummy variable which indicates whether the individual was classified as a Trailblazer or a Cohesive, where Cohesive is the baseline category. Trailblazing research agendas tend to be more multidisciplinary, risk-taking, and collaborative, while cohesive research agendas are more disciplinary, specialized, and focused on a specific topic with the purpose of developing expert knowledge on it. This classification is derived from previous works (Santos and Horta 2018) and is created from a two-step cluster analysis using the low-level MDRAI dimensions as input variables. This archetype of strategic research agendas is a more generalist and multivariate representation of strategic agendas as a whole, rather than understanding such agendas through distinct dimensions. Table 1 summarizes the characteristics and features of each agenda archetype in greater detail.

Table 1: Characteristics of agendas archetypes

Variable	Cohesive	Trailblazer
Discovery	4.158 (0.048)	5.086 (0.086)
Conservative	3.359 (0.049)	2.292 (0.066)
Tolerance for Low Funding	4.361 (0.062)	5.129 (0.095)
Mentor Influence	2.775 (0.063)	2.211 (0.089)
Prestige	4.905 (0.054)	5.058 (0.092)
Drive to Publish	5.233 (0.057)	5.466 (0.090)
Mastery	3.943 (0.050)	2.669 (0.067)
Stability	3.898 (0.044)	2.834 (0.065)
Branching Out	4.328 (0.049)	5.464 (0.065)
Multidisciplinarity	4.750 (0.057)	6.035 (0.068)
Will to Collaborate	5.277 (0.052)	5.905 (0.066)
Invited to Collaborate	4.835 (0.059)	5.592 (0.076)

Notes: Standard Deviation is in parenthesis.

Control variables were included to account for most of the research determinants which were discussed in the literature review. For demographic-related factors, *Age* and Gender (female researchers are the baseline) were chosen. *Self-efficacy*, which represents the composite score computed from the General Self-Efficacy scale (GSE; Schwarzer & Jerusalem, 2010) was chosen as a psychological predictor. Organizational factors associated to research productivity are considered through several dimensions from the Multi-Dimensional Research University Workplace Inventory (MDRUWI; Santos, 2018). These are *Social Satisfaction*, which represents the degree of satisfaction a researcher has regarding his peers and colleagues; *Leadership Satisfaction*, the degree of satisfaction a researcher has with one's leadership; and *Unconstraint*, which reflects the lack of pressure to do work unrelated to research, such as handling teaching or administrative tasks. *Research oriented university* controls for institutional differences in the workplace– this is a dummy variable which assumes the value of 1 if the participant's institution ranks in the top 500 universities of the Shanghai World University Ranking, and 0 if it does not. *Early Career* is another dummy variable that equals 1 if the participant is under 40 years old, and 0 otherwise. This follows Bazeley's (2003) suggestion to use the age of 40 years as an indicator of early career stage. *Field of Knowledge* is also used, as a factor based on the Organisation for Economic Co-operation and Development's six fields of knowledge of the researchers' Ph.D., where Exact Sciences are used as a baseline. This variable aims to control for bibliometric differentials that exist across disciplinary fields (despite the majority of the participants hailing from the social sciences). *Publications / Citations before 2016* are used in the short-term models to account for past (career) productivity. Several field specific publication controls are included: notably, *publications (psychology), publications (economics & finance), publications (business management), publications (social science).* These variables were built based on the journal's fields of knowledge where the participants tend to publish more, and through it control for their sub-field focuses, expertise and preferences within the broader field of the social sciences. Each of these is a dummy variable that equals 1 if the participant mostly publishes in journals in the aforementioned sub-field. The reference category for these variables is *Publications (other)*, indicating a focus in any sub-field other than those mentioned above.

Results

Prior effect of research productivity on strategic research agendas and archetypes

The precursor analysis aims to ascertain whether past publications and citations are associated with research agendas and archetypes. This analysis is done via OLS regressions for the strategic research agenda variables and a logistic regression for the strategic research agenda archetype. Both are shown concomitantly for parsimony. The first model concerns publications.

Table 2 shows that the number of publications is strongly associated with research agendas. *Publications Until 2016* has positive impacts on *Prestige* (B = 0.009, Beta = 0.226, $p < 0.01$), *Drive to Publish* (B = 0.008, Beta = 0.272, $p < 0.01$), *Branching Out* (B = 0.003, Beta = 0.110, $p < 0.05$), *Multidisciplinarity* (B = 0.004, Beta = 0.124, $p < 0.01$), *Tolerance to Low Funding* (B = 0.002, Beta = 0.079, $p < 0.1$), *Willingness to Collaborate* (B = 0.005, Beta = 0.182, $p < 0.01$), and *Invited to Collaborate* (B = 0.007, Beta = 0.208, $p < 0.01$). This also resonates with the positive effect in terms of the increased likelihood of being a researcher adopting the Trailblazer research agenda archetype (B = 0.011, OR = 1.011, $p < 0.01$). Past publications have a negative effect on *Mastery* (B = -0.003, Beta = -0.114, $p < 0.05$), *Stability* (B = -0.002, Beta = -0.090, $p < 0.1$), *Conservative* (B = -0.005, Beta = -0.177, $p < 0.01$), and *Mentor Influence* (B = -0.004, Beta = -0.129, $p < 0.01$). These findings suggest that past productivity influences the degree to which researchers adopt riskier and more ambitious research agendas. Those with a stronger publication track record are more inclined to pursue more ambitious, multidisciplinary, riskier, and collaborative research agendas. This makes sense if one reasons that these researchers' large number of accumulated publications may represent an "insurance policy" that allows them to assume riskier research agendas. Even if the new research agendas fail to produce anything relevant, the researchers may not be necessarily concerned about a lack of new publications in terms of their career stability or progression as the publications they have already accumulated ought to be a strong enough safety net, sufficient to keep them afloat career- and prestige-wise. The findings give credence to the accumulation advantage hypothesis because researchers that accumulate an advantage in terms of their publication numbers may feel motivated to achieve more, having the conditions to do so (Merton 1968). However, prolific researchers may also be the most interested in continuing to have research agendas focused on risker, collaborative, multidisciplinary research as a result of inner motivation and scientific curiosity, meaning that these findings also give credence to the sacred spark hypothesis (Cole and Cole 1973).

Table 2. Effects of pre-2016 publications on present research agendas

Variables	Prestige	Drive to Publish	Mastery	Stability	Branching Out	Multidisc.	Discovery	Conservative	Tolerance to Low Funding	Willingness to Collab.	Invited to Collab.	Mentor Influence	Agenda-type (Trailblazer)
Publications until 2016	0.009***	0.008***	-0.003**	-0.002*	0.003**	0.004***	0.005**	-0.005***	0.002*	0.005***	0.007***	-0.004***	0.011***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Research Oriented Uni.	0.258**	0.015	0.035	0.038	-0.024	0.017	-0.027	-0.014	-0.127	0.016	-0.004	-0.069	-0.124
	(0.101)	(0.078)	(0.068)	(0.059)	(0.068)	(0.087)	(0.081)	(0.077)	(0.079)	(0.072)	(0.078)	(0.079)	(0.196)
Gender (Male)	0.007	-0.071	-0.091	-0.084	0.147**	0.008	0.165**	-0.045	0.189**	-0.139**	-0.074	0.070	0.224
	(0.101)	(0.077)	(0.069)	(0.060)	(0.068)	(0.089)	(0.076)	(0.085)	(0.078)	(0.066)	(0.075)	(0.080)	(0.196)
Age	-0.003	-0.015***	0.003	0.004	-0.012***	0.001	0.000	-0.006	-0.002	-0.006	-0.004	-0.005	-0.013
	(0.006)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)	(0.011)
Self Efficacy	0.287**	0.129	-0.336***	-0.305***	0.337***	0.475***	0.371***	-0.454***	0.248***	0.310***	0.340***	-0.134	0.965***
	(0.125)	(0.095)	(0.080)	(0.070)	(0.083)	(0.103)	(0.094)	(0.093)	(0.090)	(0.088)	(0.101)	(0.091)	(0.232)
Pubs (Psychology)	0.137	0.267	0.118	0.122	-0.179	-0.374	-0.287	0.451	0.504	0.011	0.212	0.309	0.286
	(0.343)	(0.266)	(0.268)	(0.225)	(0.267)	(0.378)	(0.261)	(0.324)	(0.312)	(0.232)	(0.317)	(0.256)	(0.709)
Pubs (Economics & Finance)	0.345	0.286	0.260	0.244	-0.150	0.113	0.171	0.223	0.141	0.228	0.271	-0.147	-0.389
	(0.354)	(0.300)	(0.230)	(0.198)	(0.257)	(0.329)	(0.308)	(0.254)	(0.266)	(0.227)	(0.267)	(0.304)	(0.677)
Pubs (Business Management	0.766***	0.584***	0.025	-0.011	0.098	0.107	0.415*	-0.167	0.341*	0.221	0.405**	-0.039	0.712
	(0.245)	(0.204)	(0.167)	(0.140)	(0.187)	(0.234)	(0.219)	(0.196)	(0.198)	(0.175)	(0.200)	(0.206)	(0.474)
Pubs (Social Sciences)	0.404**	0.237*	0.009	-0.005	0.067	0.140	0.302**	0.069	0.341**	0.194	0.441***	0.166	0.177
	(0.181)	(0.132)	(0.120)	(0.100)	(0.121)	(0.173)	(0.145)	(0.144)	(0.132)	(0.122)	(0.144)	(0.138)	(0.332)
Unconstraint	-0.050	0.020	-0.007	-0.015	-0.042	-0.040	-0.030	-0.014	0.044	-0.054**	-0.044	0.015	-0.014
	(0.040)	(0.032)	(0.028)	(0.024)	(0.030)	(0.037)	(0.035)	(0.034)	(0.034)	(0.027)	(0.034)	(0.032)	(0.077)
Social Satisfaction	0.070	0.046	-0.063	-0.061	0.094*	0.103*	0.146***	-0.036	0.016	0.483***	0.432***	-0.044	0.524***
	(0.067)	(0.054)	(0.046)	(0.040)	(0.051)	(0.061)	(0.053)	(0.055)	(0.051)	(0.053)	(0.059)	(0.051)	(0.145)
Leadership Satisfaction	-0.018	-0.002	0.069**	0.060**	-0.045	-0.055	-0.059	0.088**	-0.014	-0.012	0.019	0.054	-0.151*
	(0.041)	(0.034)	(0.032)	(0.027)	(0.032)	(0.040)	(0.037)	(0.035)	(0.035)	(0.027)	(0.032)	(0.034)	(0.083)
Early Career	0.212	0.139	0.085	0.054	-0.033	-0.047	0.003	0.058	-0.177	-0.081	-0.187	0.204	-0.668**
	(0.157)	(0.123)	(0.106)	(0.092)	(0.106)	(0.142)	(0.126)	(0.130)	(0.126)	(0.119)	(0.132)	(0.129)	(0.329)
Observations	604	604	604	604	604	604	604	604	604	604	604	604	588

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. Field of Science and Country are included in the model but omitted from the table for parsimony. A logistic regression was used for the Agenda-type (Trailblazer) variable, all others represent OLS regressions.

The second model focuses on the association between citations and research agendas (Table 3). Unlike publications, citations have no effect on any of the individual agendas, only exhibiting a negative effect on the likelihood of being a Trailblazer (B = -0.013, OR = 1.000, $p < 0.1$). Although statistically significant, the effect is close to zero. This reinforces the finding that the number of citations is not associated with the shaping of research agendas. Considering both models, this result suggests that research production, but not visibility, influences the strategic research agendas of researchers in the social sciences. Although the mechanism underlying this outcome can only be speculated upon, a possible explanation is that publications are outputs that the researcher can control, whereas citations are outcomes that are beyond the control of the researcher. In this sense, a researcher's interest in and motivation to do research may not be related to the recognition that is received for conducting and publishing research, but instead to the fact that the researcher is publishing research that he or she considers to be relevant (Brew et al. 2016). In this context, the sacred spark hypothesis seems to be more meaningful in explaining how adopting specific research agendas seems to be more dictated by interest in conducting and publishing research than anything else (Cole and Cole 1973). The effect of the accumulative advantage (Allison et al. 1982; Allison and Stewart 1974) in research productivity affecting the shaping of research agendas would probably be more convincing if the accumulation of both publications and citations were identified. The findings may also be indicative of "publish or perish" dynamics, exacerbated by evaluative and performative regimes that are a key component of environmental theories and that emphasize publications rather than citations above anything else (Tonta and Akbulut 2020).

Table 3. Effects of pre-2016 citations on present research agendas

Variables	Prestige	Drive to Publish	Mastery	Stability	Branching Out	Multidisc.	Discovery	Conservative	Tolerance to Low Funding	Willingness to Collab.	Invited to Collab.	Mentor Influence	Agenda-type (Trailblazer)
Citations until 2016	0.000	-0.001	0.001	0.001	-0.001	-0.001	0.002	0.002	0.002	0.003	0.000	0.001	-0.013*
	(0.003)	(0.004)	(0.002)	(0.001)	(0.002)	(0.003)	(0.005)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.008)
Research Oriented Uni.	0.315***	0.067	0.015	0.023	-0.003	0.045	-0.007	-0.048	-0.119	0.047	0.036	-0.086	-0.028
	(0.103)	(0.080)	(0.067)	(0.058)	(0.067)	(0.086)	(0.082)	(0.079)	(0.080)	(0.072)	(0.080)	(0.079)	(0.194)
Gender (Male)	0.077	-0.007	-0.113	-0.100*	0.171**	0.041	0.196**	-0.084	0.204***	-0.095	-0.022	0.047	0.310
	(0.102)	(0.079)	(0.070)	(0.060)	(0.068)	(0.088)	(0.077)	(0.086)	(0.077)	(0.066)	(0.075)	(0.080)	(0.194)
Age	0.001	-0.011**	0.002	0.003	-0.010**	0.003	0.003	-0.009*	-0.001	-0.004	-0.000	-0.007	-0.005
	(0.006)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.004)	(0.011)
Self Efficacy	0.262**	0.104	-0.327***	-0.298***	0.328***	0.462***	0.360***	-0.437***	0.243***	0.296***	0.321***	-0.122	0.905***
	(0.128)	(0.098)	(0.082)	(0.071)	(0.084)	(0.105)	(0.095)	(0.094)	(0.090)	(0.090)	(0.104)	(0.092)	(0.232)
Pubs (Psychology)	0.165	0.288	0.114	0.121	-0.173	-0.364	-0.273	0.446	0.513	0.036	0.231	0.307	0.271
	(0.344)	(0.261)	(0.277)	(0.231)	(0.272)	(0.383)	(0.274)	(0.333)	(0.316)	(0.230)	(0.320)	(0.262)	(0.741)
Pubs (Economics & Finance)	0.426	0.365	0.232	0.225	-0.123	0.151	0.216	0.170	0.164	0.278	0.333	-0.184	-0.287
	(0.362)	(0.307)	(0.229)	(0.196)	(0.259)	(0.338)	(0.317)	(0.260)	(0.251)	(0.235)	(0.284)	(0.299)	(0.658)
Pubs (Business Management	0.701***	0.518**	0.049	0.006	0.075	0.075	0.378*	-0.120	0.323	0.183	0.353*	-0.006	0.592
	(0.250)	(0.213)	(0.169)	(0.142)	(0.187)	(0.236)	(0.221)	(0.203)	(0.197)	(0.180)	(0.202)	(0.209)	(0.478)
Pubs (Social Sciences)	0.329*	0.163	0.038	0.017	0.037	0.101	0.270*	0.122	0.327**	0.154	0.383***	0.199	0.026
	(0.184)	(0.139)	(0.123)	(0.103)	(0.122)	(0.175)	(0.146)	(0.147)	(0.131)	(0.127)	(0.147)	(0.140)	(0.323)
Unconstraint	-0.035	0.035	-0.013	-0.019	-0.038	-0.033	-0.021	-0.024	0.049	-0.044	-0.033	0.008	0.008
	(0.041)	(0.034)	(0.028)	(0.024)	(0.030)	(0.038)	(0.036)	(0.034)	(0.034)	(0.028)	(0.035)	(0.032)	(0.078)
Social Satisfaction	0.088	0.064	-0.070	-0.066*	0.101**	0.112*	0.154***	-0.048	0.020	0.492***	0.445***	-0.051	0.554***
	(0.069)	(0.056)	(0.046)	(0.040)	(0.051)	(0.062)	(0.053)	(0.055)	(0.051)	(0.054)	(0.060)	(0.052)	(0.146)
Leadership Satisfaction	-0.025	-0.008	0.072**	0.061**	-0.048	-0.058	-0.063*	0.092**	-0.016	-0.016	0.014	0.057	-0.157*
	(0.041)	(0.036)	(0.032)	(0.027)	(0.032)	(0.040)	(0.038)	(0.036)	(0.036)	(0.027)	(0.033)	(0.035)	(0.083)
Early Career	0.164	0.099	0.104	0.070	-0.057	-0.073	0.008	0.083	-0.168	-0.100	-0.217	0.205	-0.787**
	(0.159)	(0.125)	(0.108)	(0.093)	(0.107)	(0.144)	(0.127)	(0.131)	(0.126)	(0.121)	(0.135)	(0.130)	(0.330)
Observations	603	603	603	603	603	603	603	603	603	603	603	603	587

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. Field of Science and Country are included in the model but omitted from the table for parsimony. A logistic regression was used for the Agenda-type (Trailblazer) variable, all others represent OLS regressions.

Short-term effects of agendas and archetypes

The second analysis comprises four models. The first two models focus on the association between research agendas and short-term publications and citations, as well as controls. The second two models focus on the association between agenda archetype and short-term publications and citations, as well as controls (Table 4).

Two key findings emerge in this analysis. First, evidence supporting the accumulative advantage hypothesis is obtained (Allison et al. 1982; Allison and Stewart 1974), with past publications being a strong predictor of recent publications at a rate of a 2% increase per past publication (B = 0.021, $p < 0.01$). The same trend is also observed for past citations, with a 0.2% increase (B = 0.002, $p < 0.01$). Most dimensions of the individual strategic research agendas, as well as the archetype, have no significant effect on short-term productivity or visibility, with the notable exception of *Drive to Publish*, which is a significant predictor of both publications, with an increase of 13% per unit[1] (B = 0.130, $p < 0.05$), and citations, with a 19% increase (B = 0.174, $p < 0.01$). *Invited to Collaborate* also emerges as a significant predictor of publications, with a 14% increase per unit (B = 0.138, $p < 0.1$), and citations, with a 21% increase (B = 0.199, $p < 0.01$). These results are expected. Research agendas designed around the specific goal of publishing outcomes tend to lead to more publications and citations, with researchers who set collaborative research agendas producing more publications and getting cited more often, as expected (Mamun and Rahman 2015). Additionally, *Branching Out* (i.e., the desire to expand the research focus to different fields of knowledge or topics) significantly reduces short-term research output, with a decrease of 16% per unit (B = -0.169, $p < 0.1$). This result suggests the need for a degree of topical focalization when the goal is to simply maximize output. Regarding the controls, no effects are observed concerning gender, whereas age is associated with a decline in publications at a rate of 3% per year (B = -0.034, $p < 0.01$) and citations at a rate of 2% per year (B = -0.015, $p < 0.01$). Self-efficacy, surprisingly, is also associated with reduced productivity at a rate of 17% per unit (B = -0.182, $p < 0.1$) and visibility at a rate of 26% (B = -0.299, $p < 0.01$). Concerning the organizational variables, only *Unconstraint* is found to have significant effects, enhancing research output at a rate of 7% per unit (B = 0.065, $p < 0.05$). This aligns with most of the research-teaching nexus literature, which seems to indicate that time dedicated to research competes with time dedicated to other activities (Diniz-Filho et al. 2016). Being part of a top-ranked institution has no effect on publication output but has a positive effect on citations, with a 15% increase (B = 0.147, $p < 0.05$). These findings show a relatively minor influence of environmental theory factors on short-term research productivity. When the research agenda archetype is considered, having a Trailblazer agenda has no significant effect on short-term productivity or visibility.

Table 4. Determinant effects on publications and citations after 2016

Variables	Publications (After 2016)	Citations (After 2016)	Publications (After 2016)	Citations (After 2016)
Prestige	0.025	-0.005		
	(0.044)	(0.044)		
Drive to Publish	0.130**	0.174***		
	(0.054)	(0.058)		

[1] Thus, for a one-unit increase in the *Drive to Publish* variable, the publication count is expected to increase by 13%, controlling for the other predictor variables in the model and similarly hereafter.

Mastery	-0.138	-0.241		
	(0.165)	(0.155)		
Stability	-0.049	0.142		
	(0.215)	(0.211)		
Branching Out	-0.169*	-0.149		
	(0.095)	(0.106)		
Multidisciplinarity	0.016	0.004		
	(0.052)	(0.053)		
Discovery	0.087	0.034		
	(0.057)	(0.055)		
Conservative	0.067	0.046		
	(0.058)	(0.051)		
Tolerance to Low Funding	-0.013	0.003		
	(0.044)	(0.042)		
Willingness to Collaborate	0.084	0.045		
	(0.078)	(0.074)		
Invited to Collaborate	0.138*	0.199***		
	(0.073)	(0.071)		
Mentor Influence	0.026	-0.041		
	(0.053)	(0.053)		
Age	-0.034***	-0.015***	-0.036***	-0.014***
	(0.005)	(0.004)	(0.005)	(0.004)
Unconstraint	0.065**	0.030	0.065**	0.025
	(0.031)	(0.030)	(0.032)	(0.031)
Social Satisfaction	-0.064	-0.054	0.037	0.066
	(0.056)	(0.054)	(0.050)	(0.048)
Leadership Satisfaction	0.025	0.033	0.020	0.023
	(0.031)	(0.030)	(0.032)	(0.031)
Self Efficacy	-0.182*	-0.299***	-0.067	-0.201**
	(0.098)	(0.092)	(0.097)	(0.099)
Pubs (Psychology)	0.041	0.397	0.068	0.432
	(0.273)	(0.278)	(0.296)	(0.292)
Pubs (Economics & Finance)	-0.208	0.282	-0.154	0.394*
	(0.250)	(0.201)	(0.271)	(0.216)
Pubs (Business Management)	-0.038	0.401*	0.032	0.493**
	(0.206)	(0.211)	(0.197)	(0.201)
Pubs (Social Sciences)	0.024	0.163	0.092	0.229
	(0.146)	(0.143)	(0.145)	(0.146)
Publications until 2016	0.021***		0.024***	
	(0.002)		(0.002)	
Research Oriented Uni.	-0.025	0.147**	-0.028	0.127*
	(0.079)	(0.072)	(0.079)	(0.075)
Gender (Male)	-0.068	0.017	-0.098	-0.003
	(0.079)	(0.074)	(0.077)	(0.077)
Citations until 2016		0.002***		0.002***
		(0.000)		(0.000)
Early Career	-0.034	-0.021	-0.024	0.016
	(0.114)	(0.121)	(0.115)	(0.123)
Agenda-type (Trailblazer)			0.078	0.023
			(0.082)	(0.084)
Observations	604	604	604	604

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. Field of Science and Country are included in the model but omitted from the table for parsimony.

Long-term effects of agendas and archetypes

The third analysis comprises four models, following the same logic as the previous analysis. The main difference is that the dependent variables are now career publications and citations (Table

5). Thus, the *Publications/Citations Until 2016* variables are omitted from the model, as this information is incorporated into the career data as per the analytical plan.

Strategic research agendas are found to be strongly associated with career research productivity and visibility. Beyond the positive association of *Drive to Publish*, also found in the previous analysis, a new positive association is also observed between *Prestige* and research output, with each unit of increase in *Prestige* increasing publication rates by 9% (B = 0.094, $p < 0.05$). This result highlights scientific ambition as a key driver of research productivity over the career lifecycle. Furthermore, unlike in the short-term models, *Mastery* has significantly negative associations with career *Publications*, leading to a 32% decrease per unit (B = -0.383, $p < 0.01$), and *Citations*, leading to a 50% decrease (B = -0.693, $p < 0.01$). Similar results are also found for the association between *Branching Out* and both *Publications*, with a 20% decrease (B = -0.222, $p < 0.05$), and *Citations*, with a 30% decrease (B = -0.355, $p < 0.05$). This result suggests that excessive research career specialization in or diversification of topics can be detrimental in terms of productivity and visibility. Regarding specialization, the researcher may be exhausting all publishing opportunities on the singular topic in which he or she is specializing. Regarding diversification, the researcher may be overly dispersing his or her research focus to be able to gain a foothold in any topic. This resonates with the layman notion of being a "jack of all trades, [but a] master of none." *Discovery* is found to have a significant and positive effect on citations, with a 19% increase per unit (B = 0.181, $p < 0.1$). Novel research has more potential to gain visibility when published but often faces obstacles to publication as a result of known conservationism in peer-review processes. *Mentor Influence* is associated with fewer publications, leading to an 8% decrease per unit (B = -0.077, $p < 0.1$). Finally, *Invited to Collaborate* maintains identical effects to those observed in the short-term analysis. *Age*, unlike in the short-term analysis, is positively correlated with career publications, at an increased rate of 1% per year (B = 0.012, $p < 0.01$), and citations (B = 0.013, $p < 0.01$). It is found that males produce more over the career lifecycle than females, by 32% (B = 0.279, $p < 0.01$), and their publications also have more visibility, by 33% (B = 0.289, $p < 0.01$). The associations between self-efficacy and the organizational variables remain the same as those in the short-term analysis, but working in research-oriented universities demonstrates a strong positive association with both research output and visibility.

The archetype analysis results show that researchers that follow a Trailblazer research agenda exhibit a substantial advantage over those pursuing Cohesive research agendas in terms of both *Publications*, by 36% (B = 0.308, $p < 0.01$), and *Citations*, by 27% (B = 0.241, $p < 0.01$). This result suggests that social science researchers who adopt Trailblazer research agendas have distinct advantages in terms of research performance throughout their careers.

Table 5. Determinant effects on total publications and citations

Variables	Publications (Total)	Citations (Total)	Publications (Total)	Citations (Total)
Prestige	0.094**	0.119*		
	(0.041)	(0.067)		
Drive to Publish	0.210***	0.233***		
	(0.054)	(0.089)		
Mastery	-0.383***	-0.693***		
	(0.141)	(0.215)		
Stability	0.189	0.502*		
	(0.181)	(0.283)		
Branching Out	-0.222**	-0.355**		

	(0.092)	(0.150)		
Multidisciplinarity	-0.025	-0.020		
	(0.046)	(0.071)		
Discovery	0.087	0.181*		
	(0.058)	(0.095)		
Conservative	-0.031	-0.004		
	(0.054)	(0.087)		
Tolerance to Low Funding	0.043	0.060		
	(0.042)	(0.065)		
Willingness to Collaborate	0.031	0.154		
	(0.071)	(0.113)		
Invited to Collaborate	0.229***	0.194*		
	(0.065)	(0.108)		
Mentor Influence	-0.077*	-0.116		
	(0.047)	(0.074)		
Age	0.012***	0.013*	0.018***	0.025***
	(0.004)	(0.007)	(0.005)	(0.007)
Unconstraint	0.065**	0.077*	0.080***	0.093**
	(0.026)	(0.041)	(0.030)	(0.045)
Social Satisfaction	-0.035	-0.078	0.085*	0.102
	(0.054)	(0.086)	(0.049)	(0.073)
Leadership Satisfaction	0.015	0.056	-0.020	-0.001
	(0.030)	(0.044)	(0.031)	(0.049)
Self Efficacy	-0.289***	-0.278**	-0.152	-0.042
	(0.088)	(0.135)	(0.096)	(0.154)
Pubs (Psychology)	0.048	0.120	0.112	0.241
	(0.234)	(0.345)	(0.263)	(0.373)
Pubs (Economics & Finance)	0.066	-0.161	0.300	0.340
	(0.275)	(0.327)	(0.359)	(0.440)
Pubs (Business Management)	-0.391**	-0.209	-0.262	0.078
	(0.188)	(0.289)	(0.187)	(0.310)
Pubs (Social Sciences)	-0.377***	-0.432**	-0.252*	-0.188
	(0.136)	(0.214)	(0.145)	(0.246)
Research Oriented Uni.	0.179***	0.310***	0.168**	0.263**
	(0.069)	(0.109)	(0.075)	(0.127)
Gender (Male)	0.279***	0.289***	0.292***	0.374***
	(0.072)	(0.105)	(0.075)	(0.114)
Early Career	-0.163	-0.437**	-0.093	-0.316
	(0.112)	(0.183)	(0.120)	(0.198)
Agenda-type (Trailblazer)			0.308***	0.241*
			(0.083)	(0.132)
Observations	604	604	604	604

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses. Field of Science and Country are included in the model but omitted from the table for parsimony.

Discussion

This study contributes to the advancement of knowledge concerning determinants of research productivity by evidencing that the strategic research agendas of researchers are predictors of research productivity and visibility in the social sciences. This study also provides evidence that research productivity shapes researchers' strategic research agendas. It appears that there is a dialectic process in which research productivity and strategic research agendas appear to shape one another somewhat concurrently.

The analysis of the association between research productivity and strategic research agendas shows that the accumulated number of publications influences several aspects of such research agendas. Prolific researchers are more engaged in new, riskier, multidisciplinary research topics,

probably because the accumulation of publications signals to themselves, to their peers, and to their institutional environments (i.e., their university and field community) that they have achieved a level of research maturity and talent that enables them to engage in that type of research agenda with sufficient confidence (Hollister 2016). Accumulated publications signal talent capacity and trust. This is akin to the level of trust that researchers who benefit from the accumulated advantage hypothesis benefit from to obtain more resources, both human and financial; this subsequently permits them to further boost their research productivity in an ongoing virtuous cycle (i.e., the Matthew effect; Merton 1968). Publishing prolifically grants another advantage: former publications may serve as an "insurance policy" in case of failure, such that if one's new research agenda yields unsatisfactory results or nothing worth publishing, the trust backup of previously accumulated publications will protect against the potential negative outcomes of the failed new research agenda. This is an advantage that less prolific researchers lack, and as such they tend to focus on more stable, conservative research agendas, where the influence of their mentor is more visible. The focus on this latter kind of research agenda, as the findings also show (see Tables 4 and 5), does not lead to further short-term or long-term benefits in terms of both publications and citations. Therefore, the accumulated advantage hypothesis is observed for the effect of publications on shaping strategic research agendas (and it is also observed concerning the effect of this type of agenda on research productivity). However, the lack of any statistically significant effect of the number of citations on shaping the research agendas of researchers indicates that the accumulated advantage effect is not identified for measures of scientific visibility.

The findings also suggest that the sacred spark hypothesis can also explain the dynamic between the number of publications produced and the shaping of research agendas. Researchers who publish proficiently continue to do so and try riskier, multidisciplinary, and discovery-focused research agendas because they may feel encouraged and motivated to do so out of their curiosity and intrinsic interest to conduct research (Brew et al. 2016). Such researchers are not necessarily concerned with the level of interest (citations) that their research findings generate because their motivation is more intrinsic than extrinsic (Cole and Cole 1973). Therefore, the non-statistically significant association between citations and research agendas makes sense under the premises of this hypothesis. The fact that the organizational variables in Table 2 are mostly statistically non-significant also suggests that the sacred spark hypothesis offers a better explanatory power than environmental theories in explaining the association between publication and research agendas (and the reverse association as well; see Tables 4 and 5).

Concerning the analysis of how strategic research agendas are associated with research productivity, the findings show that two dimensions of strategic research agendas are always predictors of greater research productivity and visibility: drive to publish, which pertains to research agendas that are focused from the start on publishing the findings of a research project, and collaboration, which stresses the importance of setting collaborative agendas to improve the likelihood of publication and collaboration. It is relevant to note that the strategic setting of these research agendas originates from the vision and ideas of the social science researchers, and it seems more related to the researcher's convictions and beliefs than from external rewards. This seems to be the case since tolerance to low funding is never a statistically significant predictor of any of the dependent variables, both in short-term and long-term perspectives, suggesting that the drive to publish and collaborate derive more from socialization dynamics and scientific values, norms and taken for granted attitudes than from funding related rewards and pressures. This finding may provide further evidence that the sacred spark hypothesis (Cole and Cole 1973) is the most conceptually attuned to the overall results.

The dimensions of the strategic research agendas of researchers in the social sciences have a relatively minor association with research productivity and visibility when considering short-term timespans, but this changes when long-term research productivity spans (i.e, career) are considered. Those researchers assuming trailblazing types of research agendas, that is research agendas that are more likely to expand into other fields of knowledge, with a degree of multidisciplinary focus, collaborative, and risk-taking, will be more productive throughout their careers and have their publications receiving greater number of citations. This suggests that those researchers in the social sciences who attempt to push the knowledge further and work on knowledge frontiers will likely be rewarded when compared to those working with cohesive research agendas that are dominated by development of expertise within limited fields of knowledge, over-specialization and disciplinary in nature. However, some caution is needed when considering these findings since it is difficult to know whether being a Trailblazer is a preference, an opportunity, or a mix of both. Not every research is driven towards breakthrough research, nor would that be desirable since consolidating existing knowledge is just as important as creating new knowledge. Yet, there is evidence that researchers might simply not have the opportunity to pursue breakthrough research even if they desire to do so. Funding for riskier topics is more difficult to acquire (Young 2015) and this, coupled with institutional pressure to publish for the sake of indicator maximization (Grupp and Mogee 2004), can lead researchers to pursue "safer" options. This is evidenced in the literature when it is shown that conservative options are pursued to the detriment to knowledge advancement due to career considerations (Rzhetsky et al. 2015). This is paradoxical and highlights the perverse nature of incentives to secure research funding, which may be damaging to many fields of knowledge, and particularly for those in the social sciences who are balancing a multitude of tensions (Stephan 2012). Nevertheless, it is important to note that tolerance to low funding does not exhibit significant effects by itself. However, the Trailblazer cluster, which exhibits higher tolerance to low funding scores, is positively correlated with career publications and citations. This finding may suggest that by itself, having a high tolerance to low funding has no direct impact on the results, but it may cause researchers to gravitate, over time, toward riskier endeavors, which will eventually yield greater rewards.

The findings of this study have several implications for the field of scientometrics, to social science researchers and to policymakers concerning research productivity. First, the application of researchers' strategic research agendas applied to bibliometrics studies has the potential to open new avenues of research and offer new insights into the knowledge production processes. The second set of implications is for researchers and their professional careers. Understanding the associations between the dynamics of the strategic research agendas and productivity can offer insights to researchers seeking to improve their research outputs and outcomes. In some cases, the process of strategic research agenda setting may be not fully controlled by the researcher, if for example, one is an early career researcher. However, understanding these dynamics can assist researchers in steering their research work towards specific directions if such is required of them. This is also valid for research agency funding strategists and institutional leaders wanting to foster greater research performance within their institutions.

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