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**quality of academic writing**

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# Data Policies, Data Management and the Quality of Academic Writing<sup>1</sup>

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## Abstract

Publishing in top-ranking journals in the Social Sciences and International Relations requires writing with clarity. Accurately described and transparent methods sections ensure high quality academic writing. In the methodology section of empirical papers explain exact steps taken by the authors when operationalizing concepts and testing hypotheses to facilitate replication. This also allows for monitoring quality, challenging findings and promoting good scientific practice. The quality of methodology sections is not a given, but the result of interaction between academic cultures of data sharing, effective application of rules, academic excellence and good quality Research Data Management (RDM). This article evaluates the impact of standards on the replicability of a paper. Specifically we test the impact of a) research funders' data policies, b) rising expectations of RDM quality at the data collection level, c) replication policy/data policy of academic journals. To do so we run an empirical analysis of a set of 66 articles published during the period 1984-2013 that use data from all waves of the European Values Survey (EVS) to ensure variation in RDM quality across waves. We find differences demonstrating the impact of good RDM and data policies as integral to good scientific practice.

Keywords: data policies, replication, data management, European Values Study, academic writing, social sciences

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<sup>1</sup> The data underpinning this paper is available from Alexia Katsanidou, Laurence Horton, Uwe Jensen (2014) "Data Policies, Data Management and the Quality of Academic Writing" datorium <http://dx.doi.org/10.7802/70>

## Introduction

The focus of this article is the impact of standards on methods sections in Social Science and International Relations journal articles. The methods section describes the research procedure, translating theory into testable hypotheses with information on the research design, hypothesis, operationalization of measures, units of observation, data collection, verification, and analysis. The methods section should provide information to allow other researchers to replicate the research without requesting extra information from the author (Berg 1998).

This article has three goals. First, to express expectations on how methods sections should be structured, we distinguish between papers using primary and secondary data and formulate a typology of what should be included. Second, we examine current data policies, making associations regarding the decisions and actions of research stakeholders and the effect on good RDM practice as reflected in published articles. Third, we test for differences over time and between data types using datasets from the four waves of the European Values Study. Our data comes from coding a set of 66 articles based on EVS data published between 1984 and 2013. This ensures variation in RDM quality across waves. We find differences that demonstrate data policies and RDM expectations have made a difference to the replication standard quality of articles.

An impulse behind the emergence of behaviourism in the social sciences, including international relations, was to bring scientific methods and rigour to social enquiry. With scientific methods comes the requirement to replicate, recreate, repeat, revise or re-compute methodologies and data to test the accuracy and validity of claims purportedly based on evidence. As King (1995:444) states: “the only way to understand and evaluate an empirical analysis fully, is to know the exact process by which the data were generated and the analysis produced.”

Scientific replication - the ability to independently verify the results of an experiment through copying the method of the original experiment or data analysis - goes back to Geber’s investigations into alchemy in the eighth century. Easton (1953) declared the ability to verify one’s generalizations as a foundation of behaviourist political science. It is unsurprising in an age of greater data availability that academic publications are using data more frequently than in the past (Busenitz et al. 2003; King 2006). However, what is surprising, is that the requirement to produce scientific outputs that can be independently understood through clearly described methods, and with data available to research community within legal, commercial and ethical boundaries, was for a long time an ideal rather than a norm.

Replicability can be taken as simply good scientific practice. Following Popper (1959:45) we define it as: “Any empirical scientific statement can be presented (by describing experimental arrangements, etc.) in such a way that anyone who has learned the relevant technique can test it.” Science is the pursuit of a common goal: a deeper understanding of the world and the mechanisms that govern it. Enabling other researchers to replicate a study, to prove support or refute, advances us towards that common goal (King 1995). Using replication standards in papers improves the quality of academic writing by bringing transparency to research. Good scientific practice requires allowing other scholars to

reproduce the results or methods of the papers. A high quality methods section should provide the map towards replication.

The 2003 “Symposium on Replication in International Studies Research” resulted in a set of papers, which broadly examined “issues concerning the potential replication of research results from a number of different conceptual and technical perspectives” (Boyer 2003:72). Gleditsch and Metelits (2003) reviewed data-replication policies arguing that although they have been strengthened, journals fail to enforce them. However the situation might be changing for the better (Gleditsch and Metelits 2003). Ray and Valeriano (2003) studied barriers to replication by testing the replication policy of *International Interactions* from 1999 to 2001. He found existing policy was not properly implemented and better methods, procedures, customs and disciplinary norms are needed. James (2003) looked at *International Studies Quarterly* replication policies and practices concluding international relations and social sciences in general, are losing something important without replication policies. Russett suggested that not following the replication policy in the *Journal of Conflict Resolution* holds the risk of being professionally embarrassed and establishing a bad reputation for future publications with the journal. Gleditsch, Metelits and Strand (2003) evaluated the impact of making replication data available in citations, with significant positive results. Bueno de Mesquita (2003) pointed out that replication policies can speed up manuscript reviews by providing better information for referees to make recommendations to editors. What is more, he argued, they significantly can reduce errors in published research. Finally, King (2003) presented a technical solution, positing that persistent identifiers facilitate reliable sharing and citation of datasets, thereby enabling replication.

### **How to Write a Methods Section to Ensure Replicability**

Although the aim of a methods section is to explain the research process and analysis procedure, there is a difference between papers using primary data and reusing data. This distinction leads to different parameters included in the methods section, and we acknowledge that distinction in this paper.

#### *Primary Data*

Creating primary data gives primary investigators intimate knowledge of their data and methods throughout the operationalization, collection and analysis stages of a project. Simply, they know the data better than anybody, but in a methods section they must attempt to communicate that knowledge to other researchers.

In articles based on primary data, we can identify four main sections: description of unit of observation, design, measures, and procedure. The division of the subsections may vary slightly, but the presence of these verbs or their synonyms should be common.

Observation, the section describing the study, the universe of analysis, and the units, should include demographic information relating to the study. If, for example, individuals were surveyed, this could include- where relevant to the research question, participant’s age, gender, ethnicity, year in school, or marital status. And if required, provide data as

percentages, including descriptive statistics in mean and standard deviation. Design explains the type of study. Was it an experiment, survey, interview, or behavior observation? Further questions that require an answer here include: What type of observation was used?, and Why was this particular design chosen? Measures give information about the capture of observations and responses. Finally, procedure describes the process of the study exactly as it occurred.

#### *Data Re-use*

Articles using existing data do not need so much detail in explaining how the data were collected, as they can - hopefully - refer to the source of the data for information. However researchers, writing a paper re-using data have to convince readers of the suitability of these data and their usefulness in relation to their research question and hypotheses. This task becomes easier if the data are properly documented.

Finally, both types of papers need to properly describe the steps used to conduct their data analysis. The paper needs to explain why the methods employed are the most appropriate considering the nature of the data and the precise formulation of the theoretical hypotheses. If applicable, the section should also describe the specific instruments of analysis used to study each research objective. Finally, it is now expected that authors provide a full, complete reference to the data as part of the reference list. This allows the original data collector to receive credit for the academic effort put into the data collection and allows researchers interested in replication, re-use, or education and training to find the data and allows for bibliometric analysis.

Expectations as to what should be in the methods section for empirical papers are, to a great extent, formalized. However, it was not always this way. The form and accuracy of the methods section depended mainly on the research practices adopted by the individual researcher or research team, and policies employed by the journal editor where the paper was published.

Nowadays, due to a significant focus on data sharing, replicability standards and data management this is no longer the case. In the next section we look at how data policies of research funders, expectations of Research Data Management quality and journal data policies have influenced methods sections and the replication movement.

#### *Policies*

The movement towards data sharing and openness has been facilitated by technology on one side, but also a political movement on the other. Cheaper, bigger and faster storage, transmission and computational power - or the ability to do so - has been matched by the will to do so (see Anderson 2008). In International Relations (IR), the Correlates of War project brings together access to select quantitative IR data sets under the principles of “replication, data reliability, documentation, review, and the transparency of data collection procedures” (Correlates of War 2014). Big scientific challenges that can be addressed by technology and cooperation have brought data sharing agendas with them such as the Large Hadron Collider (LHC) ATLAS and LHCb and Human Genome Project 1990–2003 Bermuda Principles. This has coincided with declarations on open access (Budapest Open Access Initiative 2002, 2012) and open data in the form of the Berlin Declaration and organizational

and governmental statements from the OECD, UNESCO and G8 Science Ministers Statement, who adopt the argument that publicly funded research data is a public good that should be made open and accessible to the fullest possible extent. The European Union (2010) and national research funders (IFDO 2014) have recognized that these arguments require data infrastructures to support data storage and sharing. Yet although the direction is clear we have not yet arrived at the destination. There are still many research funders who do not require data sharing. IFDO class national funders in three categories, those with data policies that include clear implementation procedures, those with an explicit data policy but without stated implementation suggestions, and a third group of funders without policies. Of 32 nations, 52 percent do not have research funders with data policies, and of those that do, only Australia, Canada, USA, UK, Norway, Denmark, Sweden, and Finland have funders with clear recommendations on how to implement their data policy.

#### *Data Management Quality*

Since the 1960s social science data archives have been active in managing and preserving research data. Yet there remains no universally accepted Research Data Management standard. Each archive and data centre adopted their own standards to fit with funder requirements and match expectations of their user community. However, as research has become more cooperative and international, European social science data archives have actively sought to cooperate on standards of data description (DDI) and building a pan-European social science data infrastructure (CESSDA) supported by national governments. While archives started in the beginning to offer basic archive and dissemination services, they advanced their data services to current needs offering advice and support on Research Data Management and data sharing without necessarily ever archiving the research they are advising and supporting. Even within the archive aspect, there has been an emergence of recognised international standards of digital preservation (Data Seal of Approval 2014).

#### *Data Policies of Academic Journals*

Journal data policies requiring data and code underpinning articles be made available or refer readers to its availability have direct and indirect impact on the quality of methods sections. The direct impact is meeting requirements of the policy in order to publish, requirements which often ask for an explanation of the process of data collection and analysis. The indirect impact on researchers creating primary data is that to comply with data availability requirements on availability, they have to ensure sufficient contextual information is provided to make the data comprehensible and document its collection to provide transparency. Policies also challenge researchers to justify cases where data cannot be shared or shared with a limited audience rather than expect an exemption. In effect these policies impose RDM requirements on researchers. Papers based on good RDM practices should offer higher quality data and clear record of data collection in the method section.

The adoption of data policies by journals is a big step towards replication standards. King (2003) proposed a checklist of what information should be included in a proper data availability policy that would ensure the replicability of empirical papers. This list includes not only original data and code used to produce the results but details on any specialized software, with an explanation of how to reproduce the exact output presented in a published article. These requirements provide confidence in the credibility of results (Freese

2007). Likewise the PREPARDE project produced guideline requirements for data repositories to providing preservation and access to datasets as part of the scientific record. In 2014, a group of political science journal editors drafted a joint statement on Data Access and Research Transparency (DA-RT 2014:2) that committed their journals<sup>2</sup> to transparency, access and availability and included a requirement to: "...authors...delineate clearly the analytic procedures upon which their published claims rely, and where possible to provide access to all relevant analytic materials."

A number of studies have examined the presence and strength of data policies, for example JoRD (2014). In political science (Gherghina and Katsanidou 2013), economics (Vlaeminck and Siegert 2012), and sociology (Zenk-Moeltgen and Lepthien forthcoming) have contributed discipline specific overviews. In International Relations, the pressure came from the researchers themselves. International Studies Perspectives, organized a symposium on Replication in International Studies Research where researchers shared their views on the importance of replication policies. The first step was to organize a set of presentations at the 2002 Convention of the International Studies Association. They then moved to a special issue with a set of journal articles that appeared in print in 2003. The result was a bottom-up imposition to adopt a single common replication policy by the four leading international relations journals (Gleditsch et al. 2003b).

The journal's impact factor is the single biggest influence for the adoption of data policies. Top ranking journals are leaders in good research practice and there is an interaction between journals adopting data policies and what is accepted as the norm of good scientific practice. Higher impact journals are more likely to have a data availability policy (Gherghina and Katsanidou 2013), and as journals follow the leaders in making replicability a requirement, it becomes integrated as a common and accepted demand in publishing. However applying a data policy gives a boost to the journal impact factor too. International Relations journals that make their data available have a much higher impact than those that do not comply with this rule (Gleditsch et al. 2003a, b).

### *Implications for the Methods Sections*

Based on this development we expect to see that methods sections increasingly include elements essential to enable replication. In the recent years there has been a significant movement towards the adoption of replication standards. Journals especially, have updated guides for submission of manuscripts to include specific rules of referencing literature, data and other resources, explaining the methodologies used and of increasing transparency in the methods section. These expectations hold for both types of papers, those using primary and those reusing data.

The basic elements of a methods section are: a reference to data, data description and variable description. These are essential components for replication and appear in almost all journal data policies in Political Science (Gherghina and Katsanidou 2013)

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<sup>2</sup> *American Political Science Review, American Journal of Political Science, Comparative Political Studies, Journal of Conflict Resolution, Journal of Theoretical Politics, Quarterly Journal of Political Science, Political Analysis, Political Science Research and Methods, State Politics and Policy Quarterly, and Research & Politics.*

Table 1 shows these elements. Each element is paired with specific indicators that need to appear in the methods section to ensure replicability.

We expect to find an overall positive effect of these factors. In practice this translates into a time effect, as these factors intensified the closer we move to the present. The expectation is that more of the quality indicators of Table 1 will be present in empirical papers published closer to 2014.

The distinction between papers using primary data and those reusing data remains an important one. We expect empirical papers using primary data will have higher standards in their methods due to the need to describe the data. Primary investigators of a study designed for sharing, use their publications also to promote their data. Additionally, primary data are unknown and thus are expected to be presented in the paper. We expect that papers based on data re-use will reference the data description through citing the dataset so as to save space for the rest of essential methods section components.

Table 1: Elements of the Methods Section Describing Data

Elements of Methods Section	Indicators
Reference to data	Referring to the data in the text
	Indication where to find data
	Full reference in the bibliography
Data Description	Sample description
	Reporting the response rate
	Fieldwork description
	Handling missing cases
Variable Description	Question phrasing
	Scales description

*Case Study: European Values Survey (EVS)*

To investigate whether our expectations hold true we use a case study. We have chosen the European Value Survey, a survey that is widely used by Political Science, International Relations, and Sociology. It is a large-scale, cross-national, and longitudinal survey research



program focusing on how Europeans think about life, family, work, religion, politics and society with repeat waves every nine years. The first EVS wave was 1981, when Research Data Management was not well developed and there were no standardized documentation or metadata standards. Further waves took place in 1990, 1999 and 2008, with each wave surveying a larger sample in more European countries. In 1981, a thousand citizens in the European Union member states of that time were interviewed. In 2008 the survey expanded to 47 European countries interviewing 70,000 people.

This study enables us to test our expectations because it stretches over time and space, but the conditions through which it was conducted have not changed much over time. Firstly, it is an international study funded by a long list of different funders<sup>3</sup> that includes funders at the forefront of the data sharing movement. Our expectation is that change in the research environment that came with data policies will become clear. Secondly, every wave of the EVS had higher methodological standards and greater RDM needs. RDM throughout the whole lifecycle of these data is done by GESIS – Leibniz Institute for the Social Sciences (formerly the Zentralarchiv in Cologne). Since the 1980s, RDM at the GESIS data archive has become more professionalized, making the archive one of the leading survey data archives specializing in international comparative surveys. EVS experienced this increase in data management quality and became one of the important data sets in the GESIS archive. Thus, we expect to see the clear impact of increased RDM quality over time. Finally, EVS has been used as data source by its primary investigators and secondary users alike and has enabled them to produce empirical papers published in a wide range of journals. This enables us to test the impact of journal data policies on their methods sections using the same data source.

The empirical part of the paper is based on the coding of 66 published empirical articles published in the period 1984-2013 using datasets from all waves of the European Values Study. Table 2 shows how the 66 articles are divided among the four EVS waves. The articles were identified through the EVS Repository<sup>4</sup>, and Google Scholar using the search term “European Values Study.” We selected only empirical articles written in English and published in political science or sociology indexed in Web of Science. Articles using multiple EVS waves are coded on the basis of the latest wave they have used to reflect the latest standards in methods sections. Other variables include whether the author belonged to the EVS group at the time of data collection, if the journal where the article was published had a data policy at the time of publication, as well as the indicators describing the three elements of high quality methods sections from the side of data. All variables apart from the EVS Waves were coded as dummies.<sup>5</sup>

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<sup>3</sup> For a list of EVS funders, see:

[http://www.europeanvaluesstudy.eu/frmShowpage?v\\_page\\_id=2449946359342494](http://www.europeanvaluesstudy.eu/frmShowpage?v_page_id=2449946359342494).

<sup>4</sup> The EVS repository is found at: <http://www.europeanvaluesstudy.eu/evs/publications/>.

<sup>5</sup> Description of variables in the Appendix.

Table 2: Coded Articles Using EVS Data

EVS Waves	Number of coded articles
Wave 1: 1981	9
Wave 2: 1990	11
Wave 3: 1998	25
Wave 4: 2008	20
Sum	66

## Empirical Evidence

### *Descriptive Statistics*

A first look at the descriptive evaluation of our data in Table 3 shows clear differences among the primary data and data re-use. Primary users make up 30.3% of our sample and data re-users 69.7%. Compared to data re-users, primary data users indicate more frequently where their data is to be found and provide full references in the biography, but they run slightly behind in references to the data in the text. Looking deeper, this refers to articles published after the first wave of EVS data collection when the survey was not fully consolidated and primary investigators also used the data for each country as independent data collections without referring to the study as EVS, but with thorough describing of the data as one country study.

Data and variable description are also better documented by primary users than data re-users. Reporting the response rate and describing the field work proved to be statistically different between primary and secondary users. Despite the fact that data re-users have high scores in reporting data and variable description that enables users to have a better understanding of the data, they are definitely overtaken by primary data users. This might be due to the fact that data re-users restrict themselves to the information they consider relevant for the specific analysis at hand. Primary users in turn, having themselves been involved in the collection and analysis have a deeper knowledge of the data, want to give as much information as possible to the reader.

Table 3: Indicators of Methods Section Quality for Primary and Secondary Data Users

	Primary data users	Data re-user	Chi2
In our overall sample	30.3%	69.7%	-
Referring to data source	90%	100%	4.74**
Indication where to find data	60%	32.6%	4.33**

Full reference in the bibliography	48%	39%	0.67
Sample description	80%	67.4%	1.08
Reporting the response rate	35%	23.9%	3.57*
Fieldwork description	55%	30.4%	3.57*
Missing Cases handling	55%	65.2%	0.62
Question phrasing	75%	82.6%	0.51
Scales description	80%	73.9%	0.28

Note: \* p < .1, \*\* p < .05, \*\*\* p < .01 Source: Self collected data on Journal articles using EVS data N=66

Table 4 shows descriptive statistics by EVS wave, dividing our coded papers according to the latest wave they have used starting from Wave 1 in 1981 through Wave 4 in 2008. The concentration of primary data users is higher in Wave 1 and Wave 4 and lowest in Wave 3. The first element of the methods section, referring to data is clearly better done in later waves. Referring to the data sources in a place within the body of the article starts at 88.9% in Wave 1 and reaches 100% in Waves 3 and 4. Indicating within the text where the data can be found and downloaded also increases over time. Giving a full reference of the data in the bibliography of the article is non-existent in Wave 1, possibly as it was not common at that time, but reaches 42.9% by Wave 4.

Table 4: Indicators of Methods Section Quality for the Four EVS Waves

	Wave 1: 1981	Wave 2: 1990	Wave 3: 1999	Wave 4: 2008	Total
Overall sample	13.4%	16.4%	38.8%	31.3%	100%
Primary data users	44.4%	36.4%	11.5%	47.6%	31.3%
Referring to data source	88.9%	90.9%	100%	100%	97.9%
Indication where to find data	11.1%	36.4%	42.3%	57.1%	41.8%
Full reference in the bibliography	0%	36.4%	42.3%	42.9%	35.8%

Sample description	88.9%	36.4%	65.4%	90.5%	71.6%
Reporting the response rate	22.2%	9.1%	26.9%	38.1%	26.9%
Fieldwork description	77.8%	18.2%	19.2%	52.4%	37.3%
Missing Cases handling	13.4%	10.4%	37.3%	13.4%	74.6%
Question phrasing	55.6%	63.6%	92.3%	80.9%	79.1%
Scales description	77.8%	45.4%	84.6%	80.9%	76.1%

Source: Self collected data on Journal articles using EVS data N=66

Overall, the descriptive results show that primary data users are more tentative towards describing their data in the methods section. Time is also a significant component. The first wave seems to have an effect towards high quality methods sections. We then see a drop in referring and describing the data, which changes in waves three and four when replication standards become more relevant.

The second element of the methods section, data description, does not provide such clear results. In fact we see a high point in Wave 1. Then the frequency of reporting data description issues drops in Wave 2 only to increase again in Waves 3 and 4. This phenomenon could be explained by considering that in Wave 1 the EVS was innovative and those working with these data had an interest in describing them to promote the survey. Data description made their article unique. The innovation wore off in Wave 2, but then data replication and RDM standards caught up boosting data description in the methods section.

The third element of methods section is variable description. This shows a very different pattern. For question phrasing, we see an increase from Wave 1 to Wave 3 and a slight decrease in Wave 4. What we are seeing here might be the effect of referring to data documentation. Authors might not feel obliged to describe in the paper the working of questions from which their variables were derived, as they refer readers to documentation of the data, where the reader can refer to inquire about everything regarding the data. Scales description has a clear low in Wave 4 but remains quite high in the remaining time points.

### *Bivariate Statistics*

In the next step we investigate potential associations between the three elements of the methods section, describing data and three explanatory factors we described in the theoretical part of the paper: being a primary data user, time, and the journal having a data policy. We do so using bivariate correlations. Table 5 shows these associations.

Being a primary data user has an impact only in the first methods component (referring to data). In fact there is a negative association between referring to the data at all (in the text or in the bibliography) and being a primary data user. Interestingly enough, being a primary data user is also positively correlated with providing an indication in the text as to where to find the data.

Time is indicated here through a proxy: wave. What is hiding behind time is the increased quality of RDM, and greater awareness of replication. Thus we find time is the variable with the most significant associations. It has a positive impact on all three referring to data variables, and reporting question phrasing. This indicates the data sharing and replication movement has some impact on the quality of methods sections. However, a contradictory finding is the negative impact on reporting missing cases handling.

Looking into more specific indicators of the data replication movement we tested correlations with the existence of a journal data policy. Findings show a clear correlation between a policy and an indication of where to find the data used to produce the article. This is significant as the major component of journal data policies is expressed by the requirement of making the data used to produce the article available and accessible to the article’s readers. However, the rather low bivariate correlation of 0.34 shows that there is still a lot to be done to have a truly implemented data policy.

Table 5: Correlations between Indicators of Methods Section Quality and Influencing Factors

	Primary data user	Wave/time	Data policy
Referring to data source	-0.26*	0.24*	0.05
Indication where to find data	0.27*	0.28*	0.34***
Full reference in the bibliography	0.03	0.24*	0.14
Sample description	0.14	0.15	0.05
Reporting the response rate	0.1	0.17	0.21
Fieldwork description	0.21	-0.06	-0.10
Missing Cases handling	0.02	-0.34***	-0.09
Question phrasing	-0.13	0.23*	0.15
Scales description	0.08	0.14	0.02

Note: \* p <.1, \*\* p < .05, \*\*\* p < .01 N= 66 bivariate correlation coefficients are reported Source: Self collected data on Journal articles using EVS data.

### Multivariate Analysis

At this stage we construct an index to incorporate all the above mentioned elements of a good methods section. A factor analysis has shown that all items load on a single factor with Eigenvalue 1.35. The new variable is an additive index scaling from 0 to 9. We then use this additive index as the dependent variable in an OLS regression showing the causal impact of the three factors previously discussed. The independent variables used were tested for collinearity (tolerance 0.85) signifying that there is no need for caution.

Table 6: OLS Regression on the Overall Quality of a Methods Section

Constant	3.5*** (0.61)
Primary data user	0.67 (0.41)
Wave/time	0.52*** (0.19)
Data policy	0.49 (0.42)
N	66
Adj. R-square	0.107

Note: \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$  The table reports b coefficients, standard errors in parenthesis  
Source: Self-collected data on Journal articles using EVS data.

In Table 6 we see being a primary data user and the latest wave of the data have a positive impact on the good quality of the methods section of the paper. The existence of a journal data policy has no significant impact. This result is the most puzzling. The suspected reason for this non-impact is the lack of efficient enforcement. If a policy exists but remains a nicely written text in the journal website, then it is clear that authors take advantage and do not adhere to it. Thus, it is important for journal editors make sure the policy is clear, make it known to the authors at the time of submission, and ensure that the authors have followed the policy before allowing the paper to be accepted for publication.

Unfortunately, we were unable to test for the impact of data policies of funders as only six studies in our sample referred to their source of funding, none of which referred to a funding agency that had produced a data policy at the time of article publication. These data would not have offered any insight and therefore they were omitted from the analysis. The main limitation of our results is that they cannot be generalized to a population of published articles using empirical data. What we analyzed is a convenience sample of published articles using one single comparative survey program. The results can be indicative of what happens in academic publishing in social sciences, but is by no means representative of the entire field.

### Discussion

In a way, attempting RDM is a meta-phenomenon: research about research. While the field of bibliometrics has developed this well, those working in RDM are still working out what it

involves and approaches to implementation rather than studying the effect of its implementation. However, the hypotheses we were interested in testing are focusing on the effects of implementation. If funders and journals are pushing data sharing requirements, and if there is a scientific impulse towards replication, then we should be able to see the emergence of well documented research to facilitate replication of data collection methods and/or analysis of data.

We have identified expectations as to how methods sections should be, and often are, structured. We controlled for papers using primary data or reusing data. We have outlined the general trend in data policies from funder to publication, actors and the effect on good research practice as reflected in published articles. Finally, we empirically tested for differences over time from a general pre-RDM era to the current RDM conscious time using datasets from the four waves of the European Values Study between 1984 and 2013. This test clearly shows that general replication environment and RDM expectations have a positive impact on the quality of methods sections. What we also find is that journal data policies as they now stand do not improve replication standards.

Yet it also shows the ideal of replicable behavioural political science is far from realized. Possible factors that may contribute to this are agents such as funders and journals. They may have data policies but there is variation as to their strength and enforcement, so there is a degree of “wobble room” between “should” and “must,” never mind the gap between these and “advised” exists for exploitation. Likewise if there is no enforcement and no checking up on failures to make data available then efforts to promote replication standards are, ultimately, futile. There may also be a disincentive from the lower level of professional credit given to studies that attempt replication over original research. This is something that should change. For change is necessary, as only with a culture of replication, will researchers have a better appreciation of what information is required to replicate studies. Data infrastructures can only push standards and support so far, but if there is no will to accumulate experience of replication then efforts at establishing standards of RDM will be in vain.

On a positive note, when a journal sets high standards good quality replicable research will follow. High quality examples exist, coming from journals with a standing and enforced data policy such as the *International Studies Quarterly*. In March 2013, the journal published four articles on the same topic, democratic peace, and debated on the data and correctness of the empirical analysis used to reach different conclusions (Dafoe, Oneal, and Russett 2013; Gartzke and Wisiger 2013; Mousseau 2013; Ray 2013;). This is a state-of-the-art research exchange that promotes scientific debate and ensures research quality.

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Appendix

<b>Variable</b>	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>St. deviation</b>
Latest wave used	66	1	4	2.88	1.01
Author part of EVS team	66	0	1	0.31	0.47
Journal having a data policy	66	0	1	0.27	0.45
<b>Reference to data</b>					
Referring to the data in the text	66	0	1	0.97	0.17
Indication where to find data	66	0	1	0.42	0.50
Full reference in the bibliography	66	0	1	0.36	0.48
Full reference in the bibliography with doi	66	0	1	0.12	0.45
<b>Data Description</b>					
Sample description	66	0	1	0.72	0.45
Reporting the response rate	66	0	1	0.27	0.45
Fieldwork description	66	0	1	0.37	0.48
Missing Cases handling	66	0	1	0.75	0.44
Number of cases	66	0	1	0.78	0.42
<b>Variable Description</b>					
Question phrasing	66	0	1	0.79	0.40
Scales description	66	0	1	0.76	0.43
Quality of methods section	66	0	9	5.04	1.79