2.2 Socioeconomic aspects of data opennessAdvantadges and benefitsThe advantages that data sharing can bring to researchers at the individuallevel and to science in general are known and defended by numerous authors.Costello [15] lists the benefits of openness, many of which have been repeatedand expanded by other researchers [10]:

•Added value to research

•Validation of results

•Prevention of scientific misconduct and methodological fraud

•Help with policy making

•More sustainable research, as in many cases reuse has a lower cost thancreating new data

•Return of the public investment made in research

•Return of data to its place of creation or collection or to the people or communities to which it originally belonged

While the benefits are certainly more visible at the community level, it hasalso been highlighted that data sharing can bring advantages at the individual level. Some studies have related data sharing to higher citation of associated publications and higher productivity [46]. According to Costello [15], opendata increase recognition, making their productivity more visible, and reusecan lead to a lower cost in investing time and money for researchers [10

<p class="dark">Several researchers have discussed about data sharing in Archaeology fromdifferent points of view [14] [54]. The growing interest on this topic is demon-strated by the rising number of publications on open data, such as the issueof Open Archeology in the journal World Archaeology [42], the forum on thistopic in the first issue of the Journal of Eastern Mediterranean Archaeology& Heritage Studies [34] and the book dedicated to open source archaeology[17]. Also, the growing number of communications on this topic in the variousarchaeological conferences1highlights this trend [14].</p>

<p class="dark">Open data in Archaeology has been one of the main topics of interest forresearchers in this discipline advocating for open science [2] [14]. Most publica-tions on open data and open archeology in general focus on the transformationsthat these new models and practices will bring about in the discipline, for betteror worse. In this regard, the reflections of Jeremy Huggett and Andrew Bevan,who have been skeptical about the increasing volume of freely accessible data,should be highlighted. Both researchers call for caution and professionalism inthe face of the new situation, which can lead to many problems [7], in order toensure the quality of the results of archaeological research.</p>

<p class="dark">However, the majority of researchers emphasize the possibilities that opendata can provide to the discipline [33] [14] [47]. In some cases, the openness of Archaeology and in particular of research data is seen not only as a beneficialpractice but necessary for the advancement of the discipline, practically a sinequa non condition to be able to respond to the big questions that Archaeologyhas not yet been able to solve [41]. In this sense, data sharing is seen, in somecases, as a practically imperative solution to the already destructive nature ofthe archaeological research method [34] [54].</p>

<p class="dark">In their chapter included in the book Open Source Archeology [17], Mooreand Richards [54] break down the potential benefits of open data for archaeo-logical research:</p>

<ul>

<li><p class="dark">Greater participation and democratization of archeology, whichwould increase the commitment between society or the community, con-sidered the public of Archaeology [14] [18]. In short, a more open Archaeology would bring archaeological information and knowledge cloto society, it would allow the creation of a network or community with in-ternal interactions [42] [54], and it would become a more inclusive science[5] [47]. This argument is largely linked to a socio-economic reason, con-sidered one of the main justifications for defending open data in general.In publicly funded projects, very numerous in the case of Archaeology,opening the data to return to society of the investment made is presentedpractically as a moral obligation [14] [47] [2]</p></li>

<li><p class="dark">Better preservation of archaeological data, which, due to the al-ready mentioned destructive nature of the research method, becomes akey point in the work of researchers as stewards of the common culturaland historical heritage [54]. Digital data require maintenance in order tobe preserved; if shared in well-prepared repositories, the chances of thembeing preserved are much higher [33]</p></li>

<li><p class="dark">Improved archaeological research, as open data implies an increasein collaboration between members of the scientific community [4] [35].It is also seen to open up the possibilities of reaching more people andfostering multidisciplinarity [5], generating dialogue and rising new ques-tions, hypotheses and interpretations of the past [54]. At the same time,data openness increases transparency [5] and is a first step towards repli-cability of results, necessary to evaluate hypotheses and explore new pos-sibilities [4] [54] [47] [29]. In this sense, the potential of data integrationshould also be highlighted, for which it is essential to have accessibleand well-documented datasets [5] [33]. All of this certainly contributesto an improvement of science in every way, and a greater appreciation ofresearch [4] [5] [54]</p></li>

<li><p class="dark">Increased sustainability of archaeological research, which has sofar focused on funding excavation campaigns to generate new data. Al-though the process of preparing the data for later reuse is also a task thatrequires an investment of time and money, it does not involve mobilizingsuch a large number of economic and human resources [29] [70]</p></li>

<li><p class="dark">Greater impact on politicsor the cultural world beyond research [5][19].</p></li>

</ul>

<p class="dark"></p>

Disadvantages and barriersDespite widespread acceptance by international organizations and institutions,data publications are still less valued in the scientific community than articles.Overcoming this gap is presented as a key point in securing the future of theopen data model. Working to improve education in the culture of sharing andincorporating data sharing into good scientific practice [10] are necessary stepsto popularize open data and thus achieve a profound change that must affectthe whole process of scholarly publication, and all the actors involved [15] [1].In a recent systematic review of the open data literature, Chawinga [10]identifies the main barriers to data sharing

Disadvantages and barriers of data openness in ArchaeologySeveral researchers have written about the reasons why archaeologists do notshare data, barriers that some authors believe will lose weight as the open datamodel advances [33].The low number o]hat mightbe slowing down the adoption of this paradigm. For this reason, when analyzingthe disadvantages perceived by researchers, most authors have extended tothe archaeological community the reasons for not sharing identified in broaderstudies or in other disciplines. Thus, in many cases authors have commentedthe lack of incentives and appreciation from the academic community [4] [5] [42][54] [47] [2]; the existance of ethical barriers to sharing sensitive information[47] [5] that in the case of Archaeology, could lead to enhance heritage looting[14] [5]; the investment of time needed for the preparation and cleaning of thedata [46] [2];the idea of ownership over data [5] [33] [47] [2]; the fear of dataabuse, either due to misinterpretations or commercial uses [33] [5] [54] [47]; andthe fear of losing data exclusivity [4] [54]

Beyond these widespread barriers, some authors have identified specificchallenges for the implementation of the open data model in the archaeologicaldiscipline. In this sense, first of all, it should be noted that in Archaeology thereare still many data that are paper-born [63], which, in order to be shared,need go through a process of digitization that requires an extra investmentof time and money. This process therefore increases the perceived cost ofcleaning and preparing the data [63]. Second, the lack of clarity in policies hasbeen emphasized, which often do not make the publication of excavation datamandatory, which means that many archaeologists never get to publish them[5]. Finally, there has been much talk of Archaeology’s reluctance as a disciplineto adopt this new paradigm. Some authors consider this a conceptual problem,as many archaeologists are not yet convinced of the benefits that data opennesscould bring [54]. This translates into a need to “educate” the archaeologicalcommunity on the potential of open data [14] [47]

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