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Let's Talk About It: The Importance of Communication and Translation in Interdisciplinary Cooperation

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Abstract

Archaeology is very interdisciplinary in its orientation. Therefore, it presents a good case study for thinking about interdisciplinary cooperation. Most, if not all, problems with interdisciplinary cooperation ultimately reduce to problems of communication. An important part of these is due to cultural differences between academic disciplines. Real cultural differences underlie disciplinary divides, and these shape the ways people communicate. Such cultural differences can cause serious (and difficult to detect) communication problems. With careful attention to communication that is sensitive to disciplinary cultural differences, a lot of problems that are practical in nature but are fundamental to effective cooperative research can be mitigated. The importance of translators in interdisciplinary research teams is highlighted. Archaeology can use its slowly growing experience with intercultural communication to enhance its interdisciplinary effectiveness. In order to reap such benefits, it is important that attention is paid to training and employing people with a broad interdisciplinary basis, so that there are people equipped to fill the important role of translator.

Keywords

Interdisciplinary research, communication, translators

Zusammenfassung

Archäologie ist ausgesprochen interdisziplinär ausgerichtet. Daher ist das Fach ein gutes Beispiel, um über interdisziplinäre Zusammenarbeit nachzudenken. Die meisten, wenn nicht alle Probleme interdisziplinärer Zusammenarbeit lassen sich letztlich auf Kommunikationsprobleme zurückführen. Ein wichtiger Teil davon ist auf die kulturellen Unterschiede zwischen den akademischen Disziplinen zurückzuführen. Den disziplinären Differenzen liegen reale kulturelle Unterschiede zugrunde, und diese prägen die Art und Weise, wie Menschen kommunizieren. Solche Unterschiede können ernsthafte (und schwer zu erkennende) Kommunikationsprobleme verursachen. Durch eine sorgfältige Kommunikation, die den kulturellen Differenzen zwischen den Disziplinen Rechnung trägt, können viele praktische Probleme entschärft werden, die für eine wirksame kooperative Forschung von grund-legendender Bedeutung sind. Die Bedeutung des Übersetzens in interdisziplinären Forschungsteams wird hervor-gehoben. Die Archäologie kann ihre langsam zunehmenden Erfahrungen mit interkultureller Kommunikation nutzen, um ihre interdisziplinäre Effektivität zu steigern. Um diese Vorteile zu nutzen, ist es wichtig, auf Ausbildung und Beschäftigung von Personen mit einer breiten interdisziplinären Basis zu achten, damit in Teams die wichtige Rolle des Übersetzens ausgefüllt werden kann.

Schlagwörter

Interdisziplinäre Forschung, Kommunikation, Übersetzer*innen

Introduction

In this article I argue that explicit attention to communication patterns can be very beneficial in cooperative research across disciplinary boundaries. In particular, the role of disciplinary translators merits special attention. My argument comes with all the baggage of an author who is a white male archaeologist, trained in humanities departments in western European universities, but with a sciences training from secondary education. In line with the personal inspiration of the content, I have opted not to write this paper solely in traditional authoritative depersonalised language. The argument should stand and be judged on its own merits, not on what is in effect a rhetorical trick.

Due to my background, the focus of this paper is on archaeology. Because of archaeology's "magpie" approach to its object of study, however, combining as many disciplines as it can (cf. Kristiansen 2009; Sinclair 2016), the disciplinary question of how to integrate new approaches within archaeology presents a microcosm of larger interdisciplinary movements within the academy (Wallerstein 2003; Klein 2005). So, while the specifics are concerned with archaeology, the wider implications could benefit interdisciplinary collaboration outside archaeology.

The current special issue is a result of recent developments within archaeology. With the advent of new scientific techniques, old debates have seen a resurgence and older theories have seemingly received a new lease on life. These new strands of research necessitate composite teams made up of specialists from separate and sometimes quite different (sub-)disciplines. Increasingly, interdisciplinarity is also stressed as a requirement for grant success (Ion 2017: 178; Kerr 2020). At the same time, is this a new phenomenon hitting archaeology? As noted, archaeology has always been a magpie. Concerns about communication between different subdisciplines have been voiced throughout archaeology's history (Hawkes 1968; Pluciennik 2011; Sinclair 2016; see also Venclová 2007). In this sense, this recent wave might not be a new buzzword, but something that archaeology has considerable experience with. We can harness this and archaeology's slowly growing experience of intercultural communication (cf. Colley 2002; Levy 2007) to tackle the internal archaeological issue of communication between subdisciplines, but also provide inspiration for interdisciplinarity outside of archaeology (cf. Erickson 2011; Blouet 2019).

What Is Interdisciplinarity?

I do not believe that interdisciplinary knowledge is of an inherently different nature to knowledge gathered within a single discipline. Rather, the human quest for knowledge is a single rope made of different disciplinary strands (cf. Graff 2015: 1–19). In this metaphor, where one discipline ends and another one starts is largely irrelevant, as the strands are twisted in the rope-laying process. Different disciplines have different methods, rationales and truth criteria, certainly, so the metaphor should not be taken too far. I will argue below that there are very real (cultural) differences underlying disciplinary divisions, but the knowledge gained within different disciplines is not of a radically different order, although care should be taken when translating it between disciplinary languages.

Reflection on interdisciplinarity is largely the result of practical difficulties encountered in carrying out interdisciplinary research; questions such as where to report results in a publishing landscape that is organised along disciplinary lines or how to make sure that interdisciplinary research is more than mere juxtaposition of disciplinary results (cf. Birnbaum et al. 2017: 12–13, 23; although see Klein 2005). This does not mean that difficulties encountered are not real, but I contend that these are largely practical, rather than epistemological. Because of this, my focus will be on practical observations and suggestions to guide our thinking about, and improve our execution of, communication in interdisciplinary research. As my focus is on communication, there will not be space to address the political dimensions of interdisciplinarity (cf. Lotrecchiano and Hess 2019), important though they are. Furthermore, because of this comparatively practical focus, I will not delve into the differences between the various ways in which researchers from different disciplines can work together (interdisciplinarity, multidisciplinary, transdisciplinarity; see Wagner et al. 2011). Here, I will use the term interdisciplinarity to contain all the instances where people from different disciplinary backgrounds cooperate towards a common research goal.

The idea of interdisciplinarity rests on the academic “given” of different disciplines that complement each other. This is not to say that this is the only route through which interdisciplinary collaborations are forged, but if disciplines did not exist, or if they offered nothing to outsiders, there would be no point in calling such research interdisciplinary. This means that questioning interdisciplinarity can proceed in two directions. We can examine the legitimacy of dividing the human quest for knowledge and understanding, or we can probe the complementarity of the resulting disciplines. The latter path only really makes sense if we accept a very reified version of an affirmative answer to the former question. Only if we suppose that the boundaries between disciplines are natural and very rigid, and we assume that anyone’s choice to pursue a given discipline is final and absolute, can we even entertain the possibility of suggesting that different disciplines have nothing to offer to each other. Any more nuance to this position forces us to accept that if there are legitimate differences between disciplines, there is at least something that separate disciplines have to offer one another. The question of whether this interest is sufficient to warrant cooperation between disciplines quickly reduces to a practical evaluation of the individual merits of a given research question.

Fundamentally, academic disciplines as we know them today (certainly in the West) exist for practical reasons. The endeavour of human understanding has progressed so far and into such detail that it has become less and less feasible for any individual to keep abreast of all the developments within one’s own discipline, let alone those in many others (cf. Collini 1998). The epithet “the last person to know everything” has been awarded to several people in history, but they share at least one very important quality: they are all dead and have been for a long time. It is simply impossible for a finite individual to master more than a few academic specialisms. As the cutting edge of knowledge production is pushed ever outwards, an ever more specialised foundation is needed for those who wish to contribute to the endeavour. To provide and maintain this foundation, the disciplines as we know them formed more or less organically as divisions of the whole. In this practical sense, the current disciplinary divisions are certainly legitimate.

Differences in Disciplinary Culture

In describing the process of separation as “organic” I do not wish to imply that the resulting disciplines are “natural” or that the current divisions are the only possible ones. There are many different ways in which the process of knowledge gathering and creation could have been subdivided. The appeal of interdisciplinary research points to this fact. This is research that apparently does not sit comfortably in the current subdivision. The fact that positions of academic boundaries have arbitrary qualities does not mean, however, that the division is essentially random. Apart from political pressures that steered development during the growth of the university system (Wallerstein 2003), there are broad, real differences underlying “superficial” disciplinary divisions. While these do not determine where dividing lines between disciplines will be situated, they do influence the ultimate disciplinary map by suggesting natural allies or cognate disciplines, which are closer together to each other than to others.

I would argue that these very real differences in the approaches of the various branches of the academy can best be characterised as *cultural* differences. The division between the natural sciences and the humanities is the most obvious and the most debated division. How these two branches differ in object of study, truth criteria, or application of method has been debated since at least the 19th century (Collini 1998; Critchley 2001; Gould 2003) and so need not be covered here. The important differences are often found not so much in easily observable things such as the knowledge of basic principles that C. P. Snow decried in *Two Cultures* (Snow 1959; cf. Collini 1998). Snow’s argument was that scientists and those trained in the humanities had too little common ground for meaningful communication. While some of this lack of common knowledge is perhaps true, I do not think that this is ultimately as large an impediment to day-to-day communication as a lack of common phraseology or disciplinary culture. Hans-Georg Gadamer (1990) argues that the characterising difference between the *Naturwissenschaften* and the *Kulturwissenschaften* is the difference between truth and method. The sciences turn to specified replicable methods to guide their search for knowledge, whereas the object of study for the humanities does not conform to the prerequisites of scientific method. Gadamer suggests that the natural sciences and the humanities actually use different types of induction. Natural scientific induction relies on the researcher’s own reason, whereas cultural scientific induction is more instinctive, involving a certain tact, memory, and a feeling for when to allow authority to speak (Gadamer 1990: 11). Both sides think in different ways. Gadamer concludes that these are psychological

differences. I would characterise them as cultural differences, because they involve different values (e.g. in the value placed on replicable experimentation) and cultural elements such as language differences (see below). These are important differences, though they should not be overstated as some Kuhnian incommensurability (Kuhn 1962), nor as clear-cut binary divisions as in Snow's *Two Cultures* (Snow 1998 [1963], though compare later editions of the book). Broad cultural differences exist, but their ways are not wholly exclusive, nor do they map neatly onto disciplinary divisions. None of these ways of thinking is more natural, all are cultural, and intercultural communication is possible. As with any cultural group, though, members need to be taught the proper ways to think, behave, and speak.

Disciplinary Cultural Socialisation

In schools and universities, where humans are disciplined into their respective fields, training sows the seeds of these cultural differences. Students need to learn disciplinary vocabulary and jargon and how to use them. New words and meanings are learned in a relatively straightforward manner, but they are used in culturally specific ways. Where vocabulary is exclusive to the discipline, this does not pose a problem beyond the need to learn new terms. Sometimes, though, disciplines use general terms in discipline-specific ways. The meaning of a term may be different from one discipline to another. For example, in the sciences the word "error" has a specific technical meaning, whereas for many archaeologists it means that someone has done something wrong. Unawareness of such differences can lead to mutual non-comprehension. On the Arch-I-Scan project¹, a collaboration between archaeologists and mathematicians, we archaeologists failed to communicate to the mathematicians that when we were talking about "whole" vessels, we meant vessels from which a complete profile could be extracted. The mathematicians, under the (quite reasonable) assumption that "whole" meant undamaged, were not adequately prepared for what they were faced with. Here, the miscommunication was very obvious, but there are many situations in which it will not be so obvious and miscommunications that linger beneath the surface have a much greater potential for misaligning expectations within interdisciplinary collaborations.

Beside differences in vocabulary, there is the potential for speech patterns to be different between disciplines. Arguments are constructed differently because of subtly distinct truth criteria, and I have had the experience that even certain types of humour can be discipline specific. Because such communication patterns are not directly linked to subject matter, it is very easy for practitioners to see them as natural or universal, whereas they are actually discipline specific, leading to greater potential for confusion when interacting with people from outside one's discipline.

Disciplinary socialisation can also result in different ways of thinking and approaching questions. By and large, (natural) science education revolves around finding the correct answer. This is done through applying the right method for the problem at hand and following it through correctly. In fact, evaluation is largely focussed on this application of the correct method, rather than on the answer itself: "Show your way of working!". The correct answer achieved by the wrong method is not seen as a correct answer, since it was acquired by chance.

In the humanities, by contrast, students are taught to give good answers. "Correct" is much more difficult to define in these disciplines, and as such a good answer means a well-argued one that is not blatantly untrue. Here we also see the need to show one's way of working: single-word answers are unlikely to score high marks in humanities exam papers, but the reason for this is slightly different. Humanities teachers are not looking for the correct application of method. They are looking for a demonstration of reasoning and marshalling evidence in support of the thesis or argument. For various reasons, there are certainly incorrect, inadequate, or wrong processes of thought, but not narrowly defined correct ones.

Of course, archaeology is a poor example of this characterisation, since it amalgamates influences from so many different traditions into a single discipline. There are those with degrees in the sciences and in the arts, all equally archaeologists. There is a wide and venerable body of literature on this topic (e.g. Hawkes 1968; Coudart 2006; Criado-Boado 2016). Often, however, collaboration between different branches of archaeology encounters similar

1 <https://le.ac.uk/archaeology/research/new-approaches-to-the-material-world/arch-i-scan>. Viewed: 18.8.2022.

issues of communication that I will discuss below. So while archaeology cannot be neatly mapped onto the caricature sketched above, I would argue that the latter is still relevant for archaeology when the two broad fields of sciences and humanities interact, either internally in exchanges between different subdisciplines or externally in interdisciplinary cooperation.

The differences in training between the sciences and the humanities can lead to different dispositions to problem solving. I have no evidence beyond the anecdotal to back this up, but it might be that people who have followed a science training are primed to look for a general solution first, because it is in the general that problems should be solved. Starting by working through a concrete problem by hand is in some ways an admission of failure to find an elegant general solution out of which the answer to the concrete problem emerges. By contrast, those disciplined in the humanities see it as unavoidable to first work painstakingly through all the specific sources to describe and understand a specific case and then distil a general answer from that. As a result, they may have fewer objections to starting with legwork.

Similarly, there may be different attitudes to quantification. Those socialised in quantitative disciplines may be more inclined to work with quantitative ball-park figures, homing in on an accurate number through iteration, whereas more qualitatively minded researchers are often very reticent to quantify ideas, because they feel that this suggests spurious accuracy or certitude. For example, date ranges for Gaulish *terra sigillata* are often (though not exclusively) expressed in terms of reigns of Roman emperors rather than as numerical dates (e.g. Webster 1996). When pressed to explicate what such ranges mean, pottery experts I have talked to have often been very resistant to put numbers to their date ranges. Conversely, quantitatively minded researchers may find non-numerical data difficult to integrate into their models (Vander Linden and Saqalli 2019). It can be very tempting to exclude such qualitative data from a formal model, or to accord it less importance in the research, to the detriment of the overall conclusions but also severely hampering cooperation within research teams. Differences in disciplinary culture can have deleterious effects on cooperation when they are explicitly observed (see Grey 2012: 151–153 for the example of friction between linguists and mathematicians at Bletchley Park), but when they pass under the radar, the effects may be much more pernicious. I will argue that explicit attention and sensitivity to disciplinary cultural differences can significantly reduce such risks.

The Necessity of Communication

It is in cooperation that the main added benefit of interdisciplinarity lies. While I will argue below that most problems of interdisciplinarity reduce to problems of communication, the foundation of success is ultimately humans joining hands to solve a problem by working together. This goes further than each person supplying their part. In the most successful collaborations, all participants are willing to go beyond their own boundaries to approach their collaborators as fellow humans. This is because true understanding is found in meaningful conversation, where participants actively try to relate to one another over the subject of the conversation (Gadamer 1990: 183–184). In trying to understand the other, one attempts to see how they got to their point, even trying to strengthen their argument to fully grasp their position. This is not accomplished by relinquishing one's own point of view, losing oneself in the other's position as it were, but rather in endeavouring to reconcile perspectives in a "fusion of horizons" (Gadamer 1990: 297, 305–312). In their chapter in a volume about archaeological computational modelling (an interdisciplinary endeavour *par excellence*), Mehdi Saqalli and colleagues (2019) stress the importance of sacrifice to the success of an interdisciplinary project. When all partners in the collaboration are willing to sacrifice some disciplinary specificity, the resulting model can be better overall. Rather than optimise the process for disciplinary standards, the whole can be more than the sum of its parts. The same applies to non-modelling interdisciplinary collaborations. Often, these do end up as little more than the juxtaposition of disciplinary results, often even published separately, but if all sides are willing to compromise, the whole can transcend this.

The importance of conversation to understanding highlights the crucial role that communication plays in interdisciplinary collaboration (cf. Lotrecchiano and Hess 2019: 183). While it will not solve all issues, communication's importance in the success of interdisciplinarity cannot be overstated. Certainly, this is because of the positive, constructive aspects of communication in bringing humans together in pursuit of a greater good, but also because most, if not all, problems of interdisciplinarity ultimately reduce to a range of problems of communication. Gunther

Tress and colleagues (2006: 467; cf. Spanner 2001) list some of the major barriers to interdisciplinary research:

“spatial distance separating research teams, additional time needed for integration, difficulties in leadership and personal chemistry, lack of common terminology, different academic traditions, different methodologies, incompatible power hierarchies between disciplines, unsuitable organizational infrastructure and the current merit system. These studies also all mention difficulties in publishing from integrative research projects.” (Tress et al. 2006: 467)

All these barriers are variations of communication problems, with the possible exception of organisational structure and the merit system (although the main way in which organisational structure impedes interdisciplinary research is by hampering effective communication). The differences in disciplinary culture described above, both in language and in practical approaches, are only problematic where they lead to misunderstandings or to a lack of communication. We need to be aware of the differences in order to address them, and often they only become apparent if some misunderstanding arose because of them, but the best way of detecting and mitigating them is open (and, ideally, face-to-face) communication.

Of course, in (interdisciplinary) teams differences of disciplinary culture are added to the cultural diversity that exists in the group of people. Academic teams are often comprised of people from different countries, with all the cultural baggage that entails. Add to this that many of these people will be communicating in what is not their first language and the (cultural) Babel that can ensue is obvious. Here, again, the only solution is more (culturally sensitive) communication.

Disciplinary jargon is, of course, another obvious issue of interdisciplinary research. It is also an overtly communication problem. The words we use to express ourselves may not be shared between project partners and need to be explained. The same holds when one partner in the collaboration does not understand the process or results of another partner. This simply reduces to not (yet) having spent enough time explaining it. Of course, not everyone in the collaboration can be an expert in all aspects of the project – that is the whole premise of interdisciplinary research – but it pays to bring people up to speed with at least the basics of the process and reasoning that go into the disciplinary input, even if only to avoid misunderstandings and misrepresentations.

Different expectations are a further problem that is ultimately a communication issue, for example, around funding. While funding is increasingly advertised as prioritising interdisciplinary research, this does not mean that interdisciplinary projects are more successful in securing it (Bromham et al. 2016). Funding may come with requirements with which some members of the research team may be unfamiliar. When we are talking about collaboration between different subdisciplines of archaeology, these problems might not be as pressing (though science-oriented archaeology often gets funded from different sources than humanities-oriented archaeology), but the wider the interdisciplinary scope of a project is, the more likely it is that certain partners in the collaboration are unfamiliar with the expectations of the funding body. Even then, it is a relatively minor issue, which can be easily dealt with, but it is one that flags the importance of communication at every stage of an interdisciplinary project, from the very inception to the final crossing of t's.

This leads to a related, but less easily resolved, problem: that of where to publish the results of interdisciplinary research. Even though interdisciplinary research is being promoted by funding bodies, publication outlets are by and large still organised along disciplinary lines. This means that it can be difficult to judge where results of interdisciplinary collaboration can and should be published (Tress et al. 2006), because it is harder to identify a suitable outlet, or because editors may (be perceived to) feel that it falls outside the scope of their journal. This need not be because of overt territorialism. Within one's discipline, one often has a feeling for which publication outlets are most prestigious. Especially if the earlier exhortation of sacrifice is adhered to, interdisciplinary research can be harder to publish, because concessions may have been made to disciplinary specificity for the common goal. The overall results of the work may be better, but that may not be reflected in the evaluation along disciplinary lines.

Additionally, academic positions are also organised along these same lines and applicants are judged on disciplinary (publication) criteria (cf. Graff 2015: 1–2). At least there is a strong perception that this is the case (see Anderson et al. 2007). Even if in reality other things (also) get taken into account (Nosek et al. 2012: 621–622), the perception of a premium on disciplinary publications can be enough to potentially make interdisciplinary publications less valuable to the careers of members of interdisciplinary teams, since they would not carry the same weight as work published in traditional disciplinary journals. The extent to which advancement in the profession is

tied to high-impact journal publications can also act as a barrier to interdisciplinary collaboration, since this work fits less comfortably in a disciplinary publishing landscape. For the same reason, the establishment of journals dedicated to interdisciplinary work is only going to be a partial solution, since, until these carry the same prestige as discipline-specific ones, it is going to be safer to publish in disciplinary outlets. In a context of precarious contracts, careers, and livelihoods, this can feed a process whereby partners in the collaboration prefer to publish the results of their specific work package separately, hampering interdisciplinary projects' success (cf. Giner-Sorolla 2012 for a similar argument regarding questionable methodological practices). The problem of communicating interdisciplinary results (to disciplinary audiences) can therefore seriously impede interdisciplinary research efforts. Of course, problems of precarity are unlikely to be resolved with solutions directed at the "narrow" issue of interdisciplinary research. Wider, institutional changes are needed, such as widening the publication bottleneck, using broader hiring criteria, and providing more secure (or at least less extremely precarious) employment opportunities in academia. While desirable, such discussions fall outside the scope of this paper.

Communicating Better

So far, I have argued that real cultural differences exist between disciplines and that these get added to the cultural spectrum of bringing together an international group of scholars when working on interdisciplinary projects. I also maintain that most problems of interdisciplinarity ultimately reduce to communications problems. The only solution to communication problems is more (and better) communication (cf. Laneri 2002; Watkins 2006; Harding 2007; Holtorf 2007 for similar approaches to specifically archaeological versions of this problem). The most important practical improvement to interdisciplinary cooperation lies in more and better intercultural communication. Within archaeology there is growing expertise, or at least experience, with intercultural communication (Martindale and Lyons 2014). This has been driven primarily by increasingly sensitive engagement with indigenous groups by archaeologists and the emergence of indigenous archaeology as an explicit mode of practicing archaeology (Ferris 2003; Smith and Wobst 2005a; Zimmerman 2005; Atalay 2006; Watkins 2006; Levy 2007; although see these very same publications, and compare Hamilakis 2016: 679 for how easily and often archaeology still gets this wrong). We should learn from this experience in our approach to interdisciplinary cooperation.

The analogy should not be seen as a perfect mapping of work with descendant communities onto interdisciplinary academic work. Of course, the scale of cultural differences and sensibilities is vastly different. The distress involved (largely borne by indigenous people) in their intercultural interactions with archaeologists is on a completely different scale to the inconvenience in which interdisciplinary miscommunication can result. It can, however, be enlightening to consider a more extreme case so that problems and the relevance of potential solutions are clearer. Since the 1970s archaeologists, most prolifically in North America, started to pay increasing attention to archaeology's relation to indigenous groups (Ferris 2003; Levy 2007). Cultural sensitivities of such groups, and the ways in which archaeological practices offended them, became more apparent to archaeologists. Not all were (or are) wholly sympathetic to indigenous groups' claims to what they consider to be their ancestors, as became clear in debates surrounding NAGPRA legislation (e.g. Meighan 1992). The 2000s saw an increase in attention to archaeological ethics (e.g. Tarlow 2001; 2006), in which the treatment of descendant communities was accorded a prominent position (see the editorial statement of the *Journal of Social Archaeology* 2001; contributions to Smith and Wobst 2005b). This movement fed into, and was driven by, a desire to create archaeological practices that were inclusive of, rather than in opposition to, descendant communities (Lyons and Supernant 2020). By attempting to collaborate to mutual benefit and devising methodologies that actively take cultural differences into account, both academics and indigenous groups can end up better for the process (Kovach 2009).

One of the most important lessons of this more thoughtful engagement with descendant communities was humility (Colwell-Chanthaphonh and Ferguson 2004; Zimmerman 2005; Hoffman 2020). Unsurprisingly, indigenous communities did not appreciate outsiders (descendants of their colonisers) coming to them to tell them what their past was like, contradicting their own narratives of their place in the universe. Being humble, not according yourself more importance than you should (when working with people who know more than you do, your importance should probably be lessened), can go a long way to establishing trust, although the process takes time and effort. Extrapolating to this article's concern for interdisciplinarity, it is worth noting that this central

value of humility resonates with Saqalli and colleagues' (2019) emphasis on self-sacrifice in interdisciplinary cooperation, discussed above.

In exploring how to ethically engage with indigenous and descendant communities, it quickly became apparent that there were culturally different ways of communicating, which were hampering communication (Watkins 2006). Archaeologists (a largely white, middle-class group) often use rather direct, explicit speech patterns, whereas members of culturally different groups are often much more comfortable with less direct, more implicit forms of speaking (cf. Elliott et al. 1999). Written contracts may also trigger very different responses depending on whether or not groups have a history of broken treaties or other reasons to mistrust officialdom (Zimmerman 2005).

Of course, archaeologists were not the only ones, nor even close to the first, to notice the differences in communication styles between minority groups and those of European descent. In wider society, the same issue was identified and acted upon. In America, publications such as the Peace Corps' *Culture Matters* (1997) and the *Toolkit for Cross-Cultural Collaboration* (Elliott et al. 1999) identified intercultural communication as a major area of potential enhancement and suggested ways of improving skills in this direction. Archaeologists wisely looked to this wider expertise to improve their own practice (Watkins 2006; see Atalay 2007 for archaeological applicability of more sensitive ways of working outside the context of working with indigenous groups). As almost all problems of interdisciplinary collaboration reduce to problems of (intercultural) communication, the utility of such tools will be obvious. I will focus on the *Toolkit for Cross-Cultural Collaboration*, as the way the authors phrased their recommendations resonates with my argument in this article, but the message is not unique to this document. Again, the cultural differences underlying interdisciplinary misunderstanding are clearly much smaller than those discussed in the report. As such, the adaptations and accommodations perhaps need not be as fundamental as some of those identified in the toolkit, but using them to shape our ideas can be very beneficial.

In the *Toolkit for Cross-Cultural Collaboration*, the authors identify unawareness of culturally different ways of communicating as one of the biggest barriers to sensitive and successful intercultural collaboration. Such unawareness is understandable in the sense that everybody is enculturated within their own group to be familiar with that group's speech patterns. It is only too easy for these to become so self-evident as to be considered part of human nature. In an American context, Candia Elliott and colleagues note that such latent assumptions can lead to problems where representatives of officialdom (who are statistically more likely to be of European descent) take their own speech patterns to be normal and others' deviations from this norm, rather than realising that theirs is but one ethnic variation in the mix, albeit the dominant one. Members of other minority groups may feel disrespected because they themselves are not familiar with the culturally particular speech pattern and what the underlying intent is.

In our example of interdisciplinary cooperation, it is not automatically the case that there is a normative difference between the various disciplinary cultures, although recognising the distinctions in disciplinary culture will still take effort. We potentially start higher up on Elliott and colleagues' (1999) "stages of intercultural sensitivity", possibly making the necessary adjustment process less complicated. Because our disciplinary cultural differences do not correlate necessarily with a disparity in privilege or power, we have a better starting point.

Elliott and colleagues emphasise that it is not outwardly visible markers of cultural diversity that are the key ones that inhibit collaboration. Rather, it is the underlying goals, values, and communication styles that "cause cultural differences to be misinterpreted as personal violations of trust or respect" (Elliott et al. 1999). It is such more subtle differences that I highlighted earlier as the important disciplinary cultural differences to bear in mind in interdisciplinary cooperation. The *Toolkit for Cross-Cultural Collaboration* further stresses that the cultural competence that forms that basis for truly successful cooperation is not "something we pick up, with time, by working with persons who are different from ourselves" (1999, cf. Lyall et al. 2013: 67 for a similar argument in the context of interdisciplinary collaboration); it requires prolonged, conscious effort. Just being exposed to difference does not automatically lead to better or more culturally sensitive communication. It is possible that such exposure can lead to accommodation, finding a *modus vivendi*, but this is not the same as understanding. Understanding forges deeper relations which enable more than simple coexistence. Such understanding is important in the building of trust, which is an invaluable component in the process by which an interdisciplinary project can achieve a whole that is greater than the sum of its parts.

Translators

In light of this required effort, it can be useful to select liaisons, not to offload responsibility onto single individuals or to have them act as representatives to speak for a group, but to facilitate smooth communication. In the context in which it was written, the toolkit suggests that liaisons can play an important role as go-betweens between officials (or the system) and minority groups. Liaisons should not necessarily act as representatives to speak for the group but act as go-betweens to facilitate communications between groups of people (Elliott et al. 1999). Of course, they need to be sufficiently versed in both cultures to successfully fulfil this role (cf. Allen and Phillips 2010: 18–19 for similar remarks regarding mutual understanding between archaeologists and indigenous communities). In a sense, they need to be cultural translators. Even though the original context is rather different than the academic context under discussion, I think this concept of the cultural translator is a good model for improving interdisciplinary communication and cooperation. Interdisciplinary research teams are not often so large as to require representatives to speak for subgroups. In this sense, appointing a separate individual to fulfil this role will not be necessary. This does not mean, however, that the idea is not useful for smaller teams. Employing someone who is versed in different disciplinary cultures (ideally, of course, those represented in the project) and who can translate between them can significantly benefit an interdisciplinary project. As a central figure who intensively communicates with the different subgroups while keeping an eye out for potential misunderstandings, they are better positioned to spot where one party interprets something differently to how another intended it, catching miscommunication early. Furthermore, because of a translator's familiarity with disciplinary cultural backgrounds present in the team and (ideally) the idiosyncrasies of different subgroups, they are also in a position to rephrase communication so as to have a better chance of being understood in the intended way.

This translating need not be someone's only task within a project team. For this reason, there is merit in considering translators in an early stage in a project (cf. Lyall et al. 2013). When putting a team together, it might be a good idea to discuss who will play the role of translator (see Gibson et al. 2019 for wider communications and career concerns in interdisciplinary project design). If new people need to be hired, it is worth contemplating having representatives of all disciplinary subgroups on the committee and paying explicit attention to this translator role in the hiring process. Of course, the translator needs to possess certain qualities, such as affinity and experience with a range of the disciplinary backgrounds in the team. Ideally, this affinity would date back to their education, as it is in this stage that disciplinary cultural attitudes are inculcated and such things may be more difficult to pick up through simple exposure (see above). We might use this point to argue for a broad educational basis for students, where they experience a broader range of disciplines than is common in western European universities. At least candidates who have received an education in more than one discipline have a leg up when it comes to being interdisciplinary translators.

Since I have argued that most, if not all, problems of interdisciplinarity reduce to communications problems and that the only solution to problems of communication is more communication, the potential role for translators is obvious (see Ng and Litzenberg 2019 for an argument for an analogous role in integrating interdisciplinary research in departments). This role is not one of a scapegoat onto which the communications problems can be offloaded, but a guiding one: helping project members engage in open, sensitive communication. This is especially so since more communication is the *sine qua non* of solving problems of interdisciplinary communication, but it is not a case that more of the same is a sufficient condition for solving communications problems. It is the better, more streamlined, (disciplinary) culturally sensitive communication that translators offer that, in my opinion, hold most promise for practical improvements in interdisciplinary collaboration.

Conclusions

In this article I have argued that most problems of interdisciplinarity reduce to communication problems. While some of these problems are systemic and, to a degree, built into the framework of academia, many of them are quite practical in nature and can be addressed or at least mitigated with sensitive attention to underlying disciplinary cultural differences. Especially the role of translators of interdisciplinary culture is very promising in addressing the practical communications difficulties that interdisciplinary teams are likely to encounter. Though technically not an act of interdisciplinary research in itself, such translation has the potential to contribute

significantly to the success of interdisciplinary research efforts. Throughout this article, I have abstracted from archaeology to academia more generally, as the points are more easily illustrated using more general examples. Archaeology, however, can be seen as a microcosm of the wider interdisciplinary landscape. Therefore, the problems and solutions in general are also present and applicable in archaeology. In intercultural communication, archaeology has considerable experience, and this experience puts us in a good place to treat disciplinary cultural differences sensitively and appoint successful translators. As a discipline, archaeology might be uniquely well placed to successfully negotiate the difficulties that come with interdisciplinary cooperation.

In the end, of course, I do not offer a silver bullet. Simply having translators is not going to solve all problems, or even all the ones that I have identified above. Interdisciplinary collaboration will still require hard labour from all parties, including the translators, although the latter's presence has the potential to smoothen the process. Furthermore, the problem of publishing the results of interdisciplinary research will not be remedied by the mere presence of translators. I am convinced, however, that a broader (inter)disciplinary mindset is advantageous to most research teams as well as outside academia. Our times call for more sensitive attention to cultural differences whatever their source, and paying explicit attention to such differences in the training of students will help the human pursuit of knowledge, whether or not these students end up in academia.

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