

Response to Reviewer 2 RC2 and Editor EC1

hess-2016-13

Improving together: better science writing through peer learning

Reviewer quote: The paper is a descriptive account of the development of academic writing groups aimed at improving basic scientific writing skills for early career scientists working in climate science / geoscience... I certainly found myself trying to imagine setting something like this...

Reply: This was nice to hear. We appreciate the reviewer's comment.

Reviewer quote: Indeed, one is the actual origins of the ClimateSnack project itself, which is introduced rather unobtrusively (*line 20, page 3*) but I think a sentence or two about its background context would help the reader.

Reply: We can certainly do this, however it will be a personal account, where the lead author will explain where the idea came from. He completed an online writing course (the exact one that we have available on the website) in 2011. During the course, a considerable online community developed; participants commented, peer-reviewed each others work and shared ideas via the course website. Once the course ended, this community disbanded, which was a shame. In order to keep the continuity going and to create a lasting community, the lead author decided that in-situ writing groups would be the perfect solution. The international community (which developed during the writing course) could be nurtured if lots of writing groups started, and if a website acted as a focal point.

Proposed action: Could the reviewer please indicate how much detail within this story he would like to have included in the paper?

Reviewer quote: Firstly, although the authors state that scientists '...must learn to better consider their audience, and communicate their science more clearly', for me, the paper wasn't especially clear on who precisely the ECRs are writing for.

The paper implies the audience is both scientists within their own discipline and those across disciplinary boundaries, so presumably the focus remains squarely on academic writing rather than drifting into popular science writing (for which there is a far richer science communication literature that is not called on here). I appreciate that there is a continuum of writing styles that can be invoked for each different audiences, but it would be helpful if the article could add a sentence making clear the specific readership that ClimateSnack participants are targeting, as that sets the rubric for all that follows in terms of how they prepare and hone their contributions.

Reply: We fully agree that the definition of the audience is indeed very important and, as the reviewer pointed out, has an impact on the writing style. The definition of the audience in the reviewed submission is stated on page 4, lines 7+8:

"The audience for these snacks are fellow ECS's. In other words, the audience is assumed to be scientifically literate but not from a single research discipline."

Arguably, the target audience should be mentioned earlier in the introduction of the ClimateSnack project in the paragraph starting on page 3, line 20 for example.

We could also be clearer that we're not aiming at popular science. But that within the 'scientifically literate' sphere, there is still a wide spectrum of possible audiences with different levels of familiarity with the ideas and themes being discussed.

Proposed action: We will be happy to make changes as the reviewer suggests. We will move the information on the proposed audience to the Introduction and include more details as we indicated here.

Reviewer quote: **Secondly, and in a similar vein, although the scheme seeks to improve 'basic writing skills, and thereby also their scientific writing skills' it is never made explicit what the deficiencies are that the initiative is trying to redress. As the paper notes, there are plenty of academic voices bemoaning the quality of academic writing but precious few that actually dissect the problem in a meaningful way; one telling exception is Goben, G.D. & Swan, J.A. 1990. The Science of Scientific Writing. American Scientist, 78 (Nov/Dec), 550-558. While the authors direct the reader to papers that presumably shed light on the substance of this problem, that is not especially helpful for an individual interested in improving their writing. Given that this paper attempts to set out the theoretical basis for this practice, it is important to be as explicit and transparent about how those championing the ClimateSnack initiative perceive the *fundamental weaknesses and limitations in mainstream academic writing*. A short section or paragraph on this should be added**

Reply: The reviewer touches on an extremely pertinent issue, and one that we should absolutely have made clearer!

So what are these "fundamental weaknesses and limitations in mainstream academic writing"? Despite us not mentioning them explicitly in the paper yet, we believe that these are addressed implicitly in the online courses that we supply plus the other expert advice. Goben and Swan hit the nail on the head when they write (paraphrasing slightly):

"Readers do not simply read; they interpret. (...) It has helped to produce a methodology based on the concept of reader expectations."

Goben and Swan also state: *"In our experience, the misplacement of old and new information turns out to be the No. 1 problem in American professional writing today."*

As Goben and Swan suggest, these issues of reader-expectations and information-placement can be addressed by considering (and practicing) sentence structure, topic and stress positions, etc. In ClimateSnack, we feel that these deficiencies are common in both our scientific publications and other forms of general outreach. Hence we need to practice and improve. Blogging within a writing group environment is a powerful way to encourage this practice and improvement. We believe that all the writing skills we practice together are transferrable to scientific writing. But as we have responded to reviewer 1, we are very aware that scientific writing needs other writing skills too.

Proposed action: We will certainly include more detailed information in the Introduction about the “*fundamental weaknesses*” ClimateSnack attempts to address. We feel that this will also be made clearer when we include some screen shots as figures. See below.

Reviewer quote: **Thirdly, the reason that the basic deficiencies need to be made more explicit is that it is not immediately clear how - or indeed, if - the ClimateSnack initiative is addressing the core communication issues raised by practitioners working in climate science arena. This is an arena that is pretty frequently addressed by those publishing in science communication. One prominent contributor is Richard Somerville, prof at Scripps and the science director of the nonprofit project ‘Climate Communication’, who has written and blogged extensively on this and highlights a range of issues that do not appear to feature in the ClimateSnack developmental process. For example, his review in Physics Today (Somerville, R.C.J. & Hassol, S.J. 2011. Communicating the science of climate change. Physics Today, October, 48-53.) critiques the conventional academic model of writing and presents some clear recommendations for making climate science writing more accessible. It may be that the authors would disagree with his contentions, but the point is that it is impossible to tell because there is no indication of to what extent the now pretty extensive critical literature on climate science communication is infusing and informing the ClimateSnack initiative. To put it bluntly, is ClimateSnack simply a self-help support group for a particular scientific cohort or is it actively carrying forward the experience of climate science communicators?**

If it is the former then OK but that more limited remit needs to be stated; if it is the latter then the paper needs to be far more explicit on how participants are building on what is out there.

Reply: We agree this is another issue that we need to make clearer in the article. In particular, this speaks to the general objectives of the initiative that we need to expand upon.

Indeed Somerville dissects the climate communication problem. ClimateSnack is concerned with a small portion of the problem that Somerville refers to as: *why don't people believe climate science?* We are interested in his final point on this issue, namely: *“Not least important is how scientists communicate—or fail to do so. Reasons for that failure include what scientists talk about as well as how they talk about it. Narrative skills help reach people.”*

Somerville indicates that this last point resonates in the realm of science-to-public communication. But it is also a problem with science-to-science communication. Somerville excludes the point that communication also needs to improve *between* scientists. Scientists are people just like the public and need to be stimulated when they read in just the same way. This is especially so in this age of increased competition (amongst published articles) and increased interdisciplinarity. We don't/shouldn't write only for researchers in our own fields. We have to accept that anyone can search for and access our articles. We can have impact in any field of research, and this should influence our writing.

We certainly agree with many of Somerville's points. Indeed the "so what?" in Figure 3 should always come up in feedback discussions in ClimateSnack group meetings. However, we would argue that the elements should also be applied to our scientific writing as well. Indeed some style guides actively encourage the "so what?" to come very early in scientific articles (for example Joshua Schimel).

ClimateSnack is not "simply a self-help support group". Firstly, with all due respect, we would argue that using the word "simply" undermines the power and usefulness of support groups such as this within the research community. A self-help support group can provide enormous support for people to get the advice they need. Any research community is comprised of many people of non-english speaking backgrounds. The reviewer will hopefully agree that these types of non-judgemental support groups can give these researchers the platform they need to voice their concerns and ask for help. Secondly, we feel that ClimateSnack does actively carry forward the experience of science communicators in general, not solely climate science. This is achieved through the writing process we have suggested, in particular the funnel model, which was developed by David Schultz. We stress in our paper that the discussions should be based on some prior knowledge. This knowledge is conveyed via the website in several different instances. We have an entire online writing course available, that Kristin Sainani has kindly allowed us to use. We also have expert advice columns and videos. Finally, we have a short book review section where some participants have written about books that helped them with their writing.

Proposed action: We need to clarify our position on the power of the "self-help group" in ClimateSnack. We also need to clarify how we are in fact promoting the advice of (climate) science communicators and experts through different media (books, videos, expert columns). All this information could be included under Section 2, which is concerned with the specifics of the writing process and the discussions.

Reviewer quote: *Fourthly, could some indicative content from the site be included? It could be a screen- shot or two, or brief excerpts from posted articles. I found myself frustrated that all I was reading about what the process and could not view the product (at least, not without accessing the webpage - perhaps a deliberate ploy. I appreciate that it is a sensitive issue, but there must be examples of 'good practice' that the team feel show- cases what the ClimateSnack initiative can achieve in recasting academic writing.)*

Reply: We thank the reviewer for this suggestion. Indeed, a screenshot (example below) from the website should be included in the corrected manuscript. This is especially useful to present some titles as teasers of the products of the ClimateSnack community (which is now called SciSnack, as it has been expanded to welcome ECS's from all disciplines).

We feel that this important suggestion may also address some of the issues the reviewer has brought up earlier. Via this figure, we can show that ClimateSnack does try to carry *"forward the experience of [...] science communicators"* as the reviewer mentioned earlier.

Proposed action: If we show four small screen shots, then we can include the homepage, a sample article, one of the video course pages and expert advice. These screen shots

and accompanying text will help illustrate that we use the web site as an outward broadcast tool, but also as a learning resource where we provide the knowledge required for informed feedback discussion and further learning.

1. *Cutting the Clutter*
 In 2012, [Kristin Sainani](#) (of Stanford University) led a [Coursera](#) course on Scientific Writing. Thousands of students followed the course. It introduced many important topics about how to improve your scientific writing. Kristin has been kind enough to allow ClimateSnack to republish her lectures from this course. The lectures from part one look at how we can 'cut the clutter' and write more concisely.

[All videos are republished with the permission of Kristin Sainani, Stanford University]

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1.1 Introduction principles of effective writing 1.2 Examples of what not to do

The mystery of the Norwegian mountains
 BY [Vol. Pfeiffer](#) • February 25, 2013 [Comment](#)

Norwegians love their mountains. They go there for hiking in the summer, skiing in the winter, and all year round to enjoy the company of friends and family in remote, cosy cabins. But I wonder, do the Norwegians know why their mountains are there in the first place? If they do, they know more than the scientific community. Here significant controversy surrounds both age and origin of these mountains.

Controversy exists because it is inherently difficult to assess mountain heights back in time. Scientists can easily measure the age of the rocks that make up the mountains. However, the resulting ages will tell us when minerals crystallized to form rocks deep in the Earth, and not how or when the rock surface has moved up or down relative to sea level. A mountain range that formed 10 million years ago can therefore easily consist of rocks that are billions of years old. In most cases of mountain formation, these older rocks are forced upwards when the stiff outer layers of the Earth (known as tectonic plates) collide. Scientists can trace these plates back in time, and assess when collisions and mountain formation took place. However, the Norwegian mountains are located in an area where the plates are currently moving away from each other. In fact, plates last

Dallas Murphy
 Dallas Murphy is a professional writer, who conducts annual science-writing workshops for Ph. D. candidates and post docs at the Max Planck Institute for Meteorology, the Bergen Geophysical Institute, the Rosenstiel School of Marine and Atmospheric Science, and, beginning this March (2014), the University of Hamburg.

For most of my students, English is not their native language, and when, some ten years ago, I began to formulate the workshop, I assumed they would need remedial work in English usage. No so. They are fully capable of writing English sentences, agreeing subject and verb, handling pronoun referents and modifiers, etc. No, the common writing problem, regardless of the writer's national origin and institution, is structure. It's not coincidental that this problem appears most starkly in the introduction, where the paper's logical structure needs to be stated clearly and succinctly. So let's talk a little about introductions and touch upon establishing a logical process for addressing structure.

The science literature published in most technical journals is highly conventionalized. You need, among other "pieces," an abstract, an intro, a methods section, and a conclusion. On the plus side, you have a kind of template as a guide.

Example of the extra figure that could be included. (Top left) Homepage. (Top right) short excerpt from one of the articles. This one was also published in Norwegian in one of Norway's national newspapers. (Bottom left) One of the chapters in the video writing course: Cutting the Clutter with Kristin Sainani from Stanford University. (Bottom right) An excerpt from one of the expert advice columns by Dallas Murphy.

Reviewer quote: Finally, many readers of this paper will lament the omission of some kind of empirical analysis of its efficacy. The informal 'survey' of why groups succeed or not simply adds to the frustration of not getting a better sense of how effective this novel approach is; to make a useful contribution more specifics on what this survey involved should be given. Overall, I'm sympathetic to the nascent nature of the initiative and also to the difficulties in determining meaningful metrics, but I agree with the other reviewer that there are indicative measures that the authors could and should consider regarding readership and impact.

Reply: It is understandable that both reviewers brought up this poignant issue. We have answered Reviewer 1 in detail on this issue. We paste this answer here for the present reviewer to consider:

Thanks to the reviewer for a very constructive suggestion. Since we received both the reviews we have had an intensive discussion within the author group about such metrics.

The author group agrees that getting formal metrics in retrospect would not be desirable. The metrics from the UEA group are very clearly described as “informal” and we only use these as indications of the effects.

Metrics are something the project managers should absolutely have considered at the beginning of the project. However, ClimateSnack has always been a voluntary project where many of us have used our free time, with little or no funding, to develop groups, support authors, and write ourselves. We feel that formal metrics would have taken considerable time to develop and instigate. This would have required considerably more funding.

The reason we think that this would have been more complicated than maybe first imagined, is that the effects of such writing groups are so multi-faceted. As we have discussed in the paper, it’s not just about writing quality; the effects are also concerned with general confidence, critical thinking, and network building. We must also consider the writing *process* in addition to the quality of the final product.

We also discussed how we could have measured improvement in writing quality. This would likely have been left up to the participant to judge himself. One of our co-authors pointed out a substantial challenge with this. He told us that he was a very confident writer before he joined ClimateSnack. However, through the writing process and group feedback, he started to understand that his writing was not as skillful as he first assumed. If he had filled out a self-assessment form before and after his participation, he may have actually perceived a decrease in writing quality, whereas objectively his writing had actually improved.

Moreover, ClimateSnack is an initiative where virtually all participants are early-career researchers. Most objective metrics would require members to have relatively long control periods both before and after joining ClimateSnack. The former requirement already excludes the large majority of members, who joined ClimateSnack during their Ph.D.

As part of the review process we carried out a survey to gather information such as acceptance rates of paper and abstracts, success in applying to travel awards etc. However, we quickly realised that most of our members joined ClimateSnack very early during the career, and that the changes in the metrics perhaps reflect more the natural development of their scientific abilities than the benefits of our writing groups.

Our most important point is that we feel our whole paper is already a metric. Indeed, it is not a quantitative metric (as alluded to by the reviewers), but it is a narrative metric. We feel that this is both more valuable and robust than an *ex post* survey, which would encounter all of the issues described above. The whole paper is built upon the narratives of 13 of the most active ClimateSnack members and others. Everyone in the author group has been a member of a ClimateSnack writing group. Some started groups that succeeded, whilst others started groups that dissolved. All the authors have built a network internationally (case in point, the present paper), and also extended their networks where they work.

Proposed action: We will add text explaining that we take a narrative approach in this paper and emphasizing how much the authors have contributed to this project. We will also add text to say that the lack of quantifiable metrics may be a limitation, but that this is something we could consider for the future. Similar projects should certainly consider metrics from the beginning.

We hope this sounds reasonable to the reviewers. Unfortunately we never had funding or time to carry out a formal evaluation from the beginning of the project. Hopefully one day we will have the funding to develop these ideas further.

Reviewer quote: **On a related note, perhaps the authors could mention something more about the international community that has been fostered as a result of ClimateSnack?**

Reply: This was indeed one of our main aims in ClimateSnack. As we wrote in the Introduction:

“ClimateSnack has two unique elements: it is self-organized.... And it tries to build an international community....”

This international community was not achieved in the way we first perceived via the commentary and interaction on the [website](#). However, the author group of the present paper exemplifies the community that did arise. ClimateSnack has been successful in bringing ECS's together. We have also arranged international workshops (separate from the writing groups), town hall events and seminars that have brought ECS's together.

Proposed action: We will certainly include information about the failure to build a community in the way we first envisaged. This should have already been mentioned in the discussion/conclusion section, since we stated it as one of the unique elements.

We can further refer to the present paper and organized events as examples of the networks ClimateSnack has motivated. After all, with all our (the co-authors) varied scientific backgrounds, it is unlikely we would have written a paper together if it weren't for our shared experiences through ClimateSnack.

Reviewer quote: **In summary, the paper is an enthusiastic but rather uncritical account of one initiative to counter perceived limitations in our current academic writing provision. While I share many of the authors' basic contentions and find the ClimateSnack an intriguing and welcome development, the paper as it stands lacks substance in key areas and I would ask the authors to attempt to address these in their revisions.**

Reply: As we mentioned above, we will include clearer indications of the communication problems that ClimateSnack attempts to tackle. We think that this gives a more holistic picture of the project.

We would however argue that we have in fact provided a rather critical account of the ClimateSnack project. We have fully disclosed the limitations and failures we encountered setting up groups. We have described writing groups that have both succeeded and dissolved. We have further stated that the majority of groups dissolved. We have also been open about the project aims that were not achieved. For example we admit that we were not clear enough about the projects objectives to start with, and that

this may have caused confusion amongst new groups. As stated above, we will also add more text about the failure to nurture the international community in the way we first envisaged.

Proposed action: If the reviewer still thinks we are being uncritical, then we would like to hear some specific suggestions to address this point. It is important for us to come across as transparent and honest in our accounts of ClimateSnack's performance. Even though we provide few quantitative metrics, we want our narratives to be as relevant, clear and informative as possible.

Thank you for your honest and constructive suggestions and criticism!