

Peer review process documentation

of the article

Building Movement Resilience: Structural and Psychological Aspects Associated With Environmental Activist Burnout

by

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Review Round 1

Comments by Reviewer A

Authors' Response to the Reviewers Round 1

I thank the authors for the opportunity to review this manuscript. Overall, the study addresses an important topic and demonstrates several notable strengths. In particular, the authors succeeded in recruiting a hard-to-reach sample, which substantially enhances the value and relevance of the findings. The analyses are robust and carefully conducted, with appropriate attention to testing underlying assumptions. Furthermore, the manuscript stands out for its commitment to transparency and reproducibility, which strengthens confidence in the reported results. That being said, I do see some shortcomings in the manuscript, mainly relating to the explication of the research gap and relatedly, the structure of the Introduction, as well as some needs for clarification or Discussion throughout the manuscript.

I wish the authors best of luck in revising their manuscript and hope that they find the below comments useful in that processes.

Thank you very much for acknowledging our work and recruitment efforts, and for providing such a helpful review. We hope that we were able to address and clarify all issues raised.

Major:

Please avoid wordings such as that your study was the first to do something. Due to the vastness of research and the global nature of output, this is usually impossible to prove and thus futile to attempt to claim. Additionally, our discipline is (luckily) moving away from its overly strong focus on novelty, towards a focus on impact and robustness of evidence. Rather, the authors should make clear how they build on and extend previous research. This is something that could be emphasized more strongly in the Introduction.

We agree that novelty should not be stressed too much as it cannot be assured and as other criteria for evaluating scientific work are much more relevant. We therefore identified the instances where a novelty focus was present and adapted them. Our contribution, however, remains that we set out to replicate many qualitative findings on activist burnout using quantitative methods – so we stuck with the label of an „emerging field“ in the hope that more quantitative and qualitative work on the topic of (environmental) activist burnout is to follow our article. An example:

We extend this emerging field by thoroughly investigating the correlates of environmental activist burnout using a quantitative approach.

Could the authors specify their research question? I am not sure I fully understand it, the way that it is phrased now. Are the authors interested in which factors predict activist burnout that

also predict collective action? Or which characteristics and elements of collective action predict activist burnout? I think the RQ could be clearer.

Thank you for pointing out that our research question was ambiguous. Overall, we were simply interested in factors associated with activist burnout. Out of the practical question on how to design collective action, we thereby put a special emphasis on factors that are known for predicting collective action. We adapted the question accordingly:

The present article therefore addresses the following research question: Which variables are associated with activist burnout? In order to learn about resilient forms of collective action, we particularly focus on psychological variables commonly known to predict collective action.

I think the authors need to restructure their Introduction a bit, particularly sections 2.1 and 2.2. Those two sections currently read a bit like a somewhat random list of factors influencing activist burnout. To me it currently is, but should not be, unclear how they authors came up with these factors, how the factors relate to each other, and what the existing empirical support there is for those factors. I think this section would benefit from (1) introducing more literature in general burnout, as opposed to just activist burnout specifically – particularly review and metanalytical work could be useful here, and from (2) making more explicit what sources the authors draw from in outlining their framework (a qualitative study seems to be at the core of it?). Further, relationships between influencing factors should be made clear, where possible.

This is a valid point. We revisited our theory section and noticed that we had not completely laid open our path of arriving at the hypotheses. In the absence of a suitable framework for choosing variables in the context of activist burnout, we based our hypotheses on the only quantitative study that resembled our own study context (Hamann et al., 2021). We also chose this approach as the variables tested in this study were backed by the few qualitative studies on activist burnout. First and foremost, we aimed to replicate these findings. Additionally, we wanted to extend them by further factors that could be of unique relevance in the environmental activist context. Therefore, one could say that we did not apply a particular framework but rather wanted to lay the groundwork for building such a framework. The literature on general occupational burnout did not directly inform our hypotheses. This body of research has developed an abundance of variables potentially associated with burnout – some of which may be transferable to the activist domain and others not. While another strategy for our work could have been to test their transferability, we decided against this approach based on our consideration of qualitative studies and the particularities of activist contexts. Nevertheless, we agree that connections to this body of literature should be made.

We made the following alterations to sections 2.1 and 2.2:

- We now begin the sections by explaining our approach.
- We added meta-analytical research to our argument, supporting the chosen variables.

- We slightly adapted the order of presenting the studies, so that the work by Hamann et al. (2021) is presented first.
- We briefly clarified how our IVs are typically linked in models of collective action.

Thank you for this suggestion. We believe that the revised section now makes our argument much stronger.

“... brings me close to a burnout.” -> I see this measure critically. I do not think it is a very good measure of burnout to ask people if they feel burnt out. I don't think the average person knows what specific symptoms burnout comes with. Please discuss this self-categorisation type measure and its shortcomings in the Limitations of Study 1 – and great to see you use a different measure in Study 2!

Thank you for pointing out this limitation of our burnout measure in Study 1. We now added the limitation to the description of Study 2 as suggested. Due to the use of the colloquial rather than technical word for burnout in the German questionnaire (which we now explicated) and the strong correlation of the two items ($r = .75$), we assume that our results were not significantly affected by this operationalization.

First, we improved our self-generated 2-item measurement of activist burnout from Study 1. The first item captured the experience of burnout as it is commonly operationalized (“I feel burnt out by my environmental (volunteer) work”), using the colloquial German equivalent of “burned out” rather than a technical term. The second item assessed self-categorization with respect to burnout by asking “My environmental (volunteer) work brings me close to a burnout”, using the technical term. Notably, the response to this item could have been influenced by participants’ prior knowledge about the concept of burnout and its symptoms. To improve measurement, we adapted the Maslach Burnout Inventory (MBI, Maslach & Jackson, 1981) in Study 2, the most widely used burnout assessment, to the activist domain.

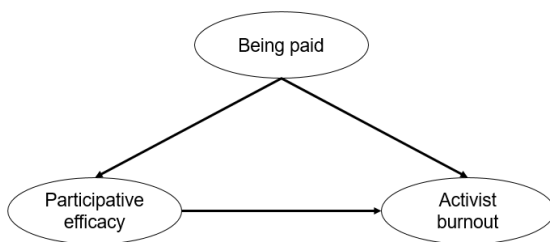
“We modelled predictor sets separately because being paid for one’s engagement may be associated with a particular kind of individual, and we did not want this structural predictor to obscure underlying psychological mechanisms.” -> I find this explanation hard to follow. Could you explain how when putting both types of variables in one block, paid engagement could have obscured the influence of psychological variables?

We took the decision to investigate structural and psychological factors separately before conducting the analyses. At that point, we expected key structural variables to be correlated with psychological variables. Precisely, we assumed participants that were paid for their engagement to report more collective efficacy (as initiatives with more opportunities to pay their members may actually be more effective), participative efficacy (as people who are paid within initiatives typically take responsibility roles) and identification with the initiative (due to the financial bond with the initiative). Moreover, we assumed that participants who were involved in more initiatives would report lower collective efficacy, participative efficacy, and

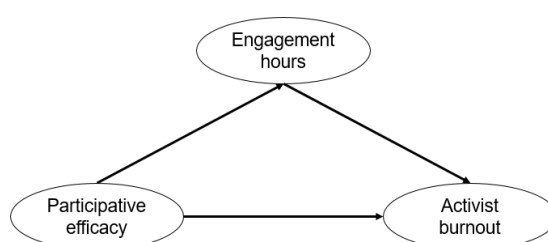
identification with the main initiative, as they are also emotionally and effectively invested in other initiatives.

If a structural variable correlated with both a psychological variable and activist burnout, there was the chance that it would constitute a confounder and mask the association between the two. This may be especially problematic if the potential confounder is a rather stable variable while psychological variables are more dynamic. This stable variable may maximize our prediction but it could also mask psychological mechanisms that are more interesting from a causal perspective. Or in other words: Based on theoretical considerations, we conceptualized being paid as a confounder and engagement hours as a mediator.

Being paid for engagement conceptualized as a confounder



Engagement hours conceptualized as a mediator



To verify our assumptions about group differences, we conducted group comparisons. In Study 1, paid and non-paid participants did not differ significantly on relevant variables such as self-efficacy, collective efficacy, participative efficacy, identification with the initiative, and environmental self-identity ($p > .05$, as reflected in the correlation table). Other than expected, the number of initiatives was positively correlated with collective efficacy ($r = .15$) and participative efficacy ($r = .18$) in the main initiative. It also positively correlated with environmental self-identity ($r = .15$). However, initiative number was not associated with burnout when other factors were considered, and thus, including all variables in the same analysis did not alter the results.

DV: Activist burnout				
	B	SE	β (95%-CI)	p
(Intercept)	4.70	0.71	0.00 (-0.11, 0.11)	<.001
Engagement (vol)	0.05	0.01	0.26 (0.15, 0.37)	<.001
Engagement (pay)	0.98	0.20	0.27 (0.16, 0.38)	<.001
Initiative numbers	0.06	0.07	0.05 (-0.06, 0.16)	.400
Pers. self-efficacy	-0.26	0.09	-0.22 (-0.37, -0.08)	.003
Collective efficacy	0.01	0.12	0.01 (-0.16, 0.18)	.935
Participative efficacy	0.11	0.11	0.09 (-0.09, 0.27)	.334
ID initiative	-0.35	0.09	-0.23 (-0.34, -0.11)	<.001
Env. self-identity	0.02	0.11	0.01 (-0.11, 0.13)	.879
$R^2 = .228$				
$F(8, 259) = 9.53^{***}$				

In Study 2, however, we found one of the expected patterns. Participative efficacy was stronger among those paid for their engagement than among those that were not ($t(472) = 2.64, p = .009$). Additionally, we found significant differences between paid (vs. non-paid) participants regarding descriptive norms of friends ($t(472) = 2.78, p = .006$) and family ($t(472) = 3.63, p < .001$), affective injustice ($t(472) = -2.87, p = .004$), moral convictions ($t(471) = -2.75, p = .006$), enhancement and protective motivation ($t(472) = -2.70, p = .007$), and competence need satisfaction ($t(472) = 2.03, p = .043$). Levene’s test was significant for career and understanding motivation, which is why we performed Welch’s test for group comparison. There were significant differences between career motivation ($t(421) = 7.23, p < .001$) and understanding motivation ($t(432) = 2.18, p = .030$). All other variables showed no significant differences ($ps > .05$). Including all variables in the same analysis changed the results in that personal self-efficacy was not significantly associated with activist burnout anymore.

DV: Burnout (exhaustion)				
	B	SE	β (95%-CI)	p
(Intercept)	3.83	0.38	0.00 (-0.09, 0.09)	<.001
Engagement (vol)	0.01	0.00	0.09 (0.00, 0.18)	.057
Engagement (pay)	0.24	0.08	0.13 (0.04, 0.22)	.004
ID movement	-0.19	0.08	-0.18 (-0.28, -0.07)	.001
Personal self-efficacy	-0.09	0.05	-0.11 (-0.23, -0.02)	.086
Collective efficacy	0.05	0.06	0.06 (-0.06, 0.17)	.337
Participative efficacy	-0.05	0.05	-0.06 (-0.18, 0.06)	.303
DN friends	0.03	0.03	0.05 (-0.04, 0.14)	.277
DN movement	0.03	0.03	0.05 (-0.05, 0.14)	.320
VM integrated	-0.01	0.05	-0.01 (-0.11, 0.09)	.893
$R^2 = .084$				
$F(9, 461) = 4.67^{***}$				

At this point, we are a little bit hesitant to alter our reported analyses at this stage as they were planned differently. Moreover, our underlying concerns of testing stable structural variables and dynamic psychological variables in the same model remains, even though it only led to small changes in results.

This is why, in the revised article, we have now focused on extending our argument on why to separate structural and psychological factors in this case, added tables including both set of predictors to the supplements, and refer to them in the results sections.

We chose to model structural and psychological aspects separately, as our main interest lay in exploring the psychological mechanisms underlying activist burnout, with an eye toward developing future causal models based on our findings. Hamaker et al. (2020) emphasize the importance of distinguishing specific research aims (description, prediction, explanation) and variable types (dynamic, stable, time-invariant). While incorporating a broad array of variable types may be a suitable strategy to maximize prediction, it does not necessarily advance our understanding of the causal and dynamic processes leading to an outcome. In this study, stable structural variables (e.g., being paid for engagement, number of initiatives) could therefore

constitute potential confounders that may affect both psychological variables and outcomes, thereby obscuring their association (see also Wysocki et al., 2022). For instance, being paid for engagement could foster participative efficacy by affording individuals a more significant organizational role, and may also exert a distinct influence on burnout. This dual association could mask the genuine relationship between participative efficacy and burnout.

Accordingly, Model 1 only included structural variables. Model 2 included psychological variables and controlled for total engagement hours – a dynamic, potential mediating mechanism. Without controlling for it, we would possibly have found the same variables associated with collective action to be associated with activist burnout. Yet, to gain insight into the characteristics of resilient engagement, we were interested in the association with psychological variables irrespective of individuals' engagement level.

However, if the editor and reviewers think that it would be necessary to change the analysis to regression models including both types of variable, we're open to changing it accordingly.

What was the distribution of paid engagement in your sample anyways? I would imagine very few people get paid for the activism?

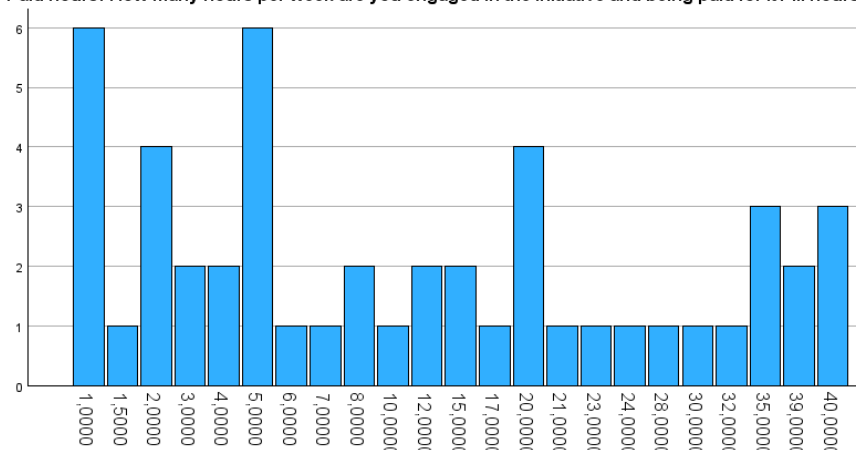
As our study focused not only on self-described activists but on people engaged in socio-ecological initiatives and the movement, we indeed find a relatively high number of people being paid for their work in these initiatives and movements. It may be noteworthy here, that in the German version of the questionnaire, we spoke of „Engagement“, which may be perceived as much less politicized and radical than activism. In our supplements, we included the definition of „active engagement“ including paid engagement:

In our understanding, an environmental initiative can be anything from a small local group up to a global NGO. It can be political work in a party as well as volunteer work in a nature conservation project. Active engagement is characterized by not only membership, but active contribution to an environmental initiative (e.g., participating in meetings or organizing events). If paid work in an environmental initiative feels like engagement, it also counts as “active engagement”.

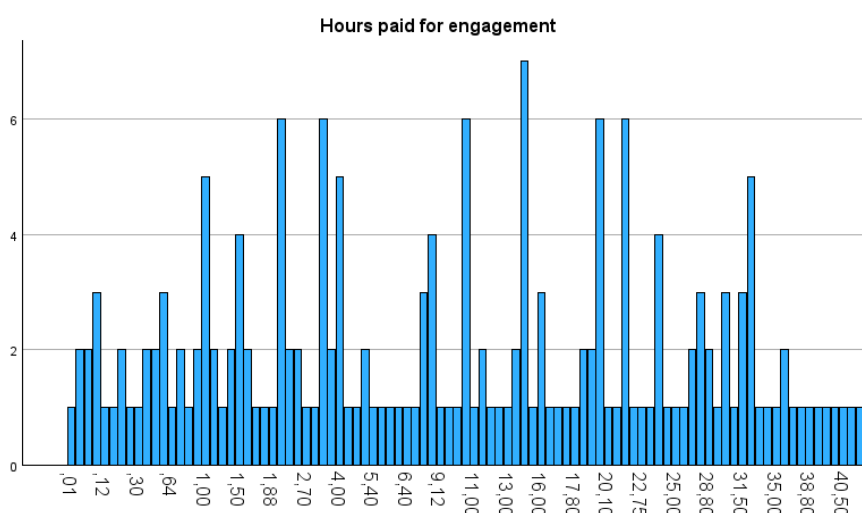
Thus, this (paid) engagement could encompass, for example, environmental educational tasks that feel like engagement such as receiving a professional fee for giving a talk for one's initiative.

In Study 1, $n = 49$ (of a total of 268) participants indicated they were paid for at least part of their engagement. The described hours ranged from one hour per week to 40 hours per week with $M = 14.50$ ($SD = 13.41$).

Paid hours: How many hours per week are you engaged in the initiative and being paid for it? ... hours



In Study 2, $n = 182$ (of a total of 483) participants indicated they were paid for at least part of their engagement during the past year. The described hours ranged from 0.01 hours per week to 45 hours per week with $M = 13.11$ ($SD = 12.28$).



If you recommend it, we can add these descriptions to the main manuscript or supplements.

I am not quite sure what we learn from the differing results with the different Cook's threshold. Maybe the authors could add and interpretative sentence to the text, something like "meaning that when we exclude outliers more strictly (or whatever the stricter Cook's threshold actually does – apologies, I am not familiar with it), variables XY become significant". If outlier exclusion is what the Cook's threshold does, then the authors should report how many outliers were excluded as a consequence of this altered threshold – or any other changes this threshold made to the data, for that matter.

We thank you for pointing out that our descriptions were not clear enough yet. Our initial manuscript included the reduced sample sizes, however, they remained somewhat hidden in brackets ($n_{H1} = 248$, $n_{H2} = 251$, $n_{explorative} = 254$). We now explicate all exclusions based on a stricter Cook's distance threshold and additionally report the excluded number of participants in the results sections.

Moreover, we repeated all analyses applying a stricter Cook's distance threshold of $4/N$, leading to an exclusion of 20 outlier participants in H1, 17 participants in H2, and 14 participants in exploratory analyses.

[...]

Notably, when excluding 17 outliers based on a stricter Cook's distance exclusion criterion, collective efficacy ($\beta = -0.20$, $p = .033$) and participative efficacy ($\beta = 0.22$, $p = .022$) became significant in the hypothesized directions.

[...]

To check for robustness, we reran all analyses using a stricter Cook's distance threshold of $4/N$, which led to an exclusion of $n = 19$ outlier participants in H1 and H2, and $n = 22$ participants in H3.

[...]

However, when excluding 22 outliers based on a stricter Cook's distance exclusion criterion, descriptive norms of the socio-ecological movement were positively linked to emotional exhaustion ($\beta = 0.11$, $p = .026$), which is in line with H3d.

Social identification with the initiative negatively predicted activist burnout ($\beta = -0.23$, $p < .001$), -> Interesting finding – I could have imagined this going the other way, too, as in, the more one identifies, the more pressure one feels and the more one's work becomes one's identity (which can be problematic, mental health-wise). Could the authors share their thoughts on this? (Having read on, I think you yourselves make exactly this point in lines 355-358).

This is a valid point. Our current take on this is that social identification („I have a lot in common with other members of the movement.“, „In general, I'm happy to be a part of the movement.“) means that an individual is ready to distribute responsibilities to other group members and draws positive experiences from their engagement that may prevent burnout.

However, this finding may depend on group size. One could imagine that in larger groups, a strong identification means having many people to share responsibilities with, whereas in smaller groups strong identification means many responsibilities and pressures on each individual member. We added a suggestion for future research regarding this idea.

Together, these findings suggest that social identification may create a fun and nourishing environment for group members that could protect against burnout within the contexts studied. However, the relationship between social identification and activist burnout may depend on specific boundary conditions such as group size. For example, in larger groups, strong identification may facilitate the distribution of responsibilities across many members, whereas in smaller groups, high identification could translate into greater perceived responsibility and pressure on each individual. Future research should examine the moderating role of group size in this association.

„compared to broader identity levels.“ – what did they mean by that? Can you be a bit more specific here? This seems to be a very interesting and crucial point.

Study 2: “adapted to the new reference group” I am not sure what the new references groups are, maybe I missed something?

As you and the second reviewer noted, this point clearly needed to be explicated further. In fact, the term identity levels was misleading here, even though identification with an initiative and identification with the socio-ecological movement may be nested identities. To avoid irritation, we now simply speak of „identities“, explicated that the socio-ecological movement is the central identity in Study 2, and expanded on the feedback leading to this decision.

Second, we aimed to test the stability of our findings across different identities. Study 1 centered on identification with participants' main environmental initiative. We evaluated our open comment section and some participants noted that they were not necessarily active in one main initiative but rather engaged in many loose networks. Moreover, we received verbal feedback by a participant who suggested that their main initiative played a relatively minor role in their motivation and potential burnout compared to broader identities. For identity processes to unfold their power, it is crucial to target identities relevant to an individual (Fritzsche et al., 2018). Accordingly, we chose the broader socio-ecological movement as an identity reference group in Study 2.

To measure aim-focused efficacy beliefs with three items each, we used similar measures as in Study 1, adapted to the new reference group of the socio-ecological movement.

As I am reading through the (many) measures of Study 2, I am finding it increasingly hard to follow, and some measure not easy to understand due to their not quite intuitive names. Could you please add an example item for each measure in brackets? Consider doing this throughout the manuscript for consistency.

Thank you for pointing out that example items are needed to increase readability of our method sections. We added an exemplary item for each measure used in Study 1 and Study 2. The sections now read, for example,

Psychological variables. Reflecting Study 1, three items measured social identification with the movement for a socio-ecological transformation, and we added a fourth item for perceived involvement following Feitosa et al. (2012, “I feel involved in what is happening in the movement”, $\alpha = .83$). We assessed evaluations of affective injustice with three items (“When thinking about what the government and economy currently do to stop socio-ecological crises, I feel outrage/ rage/ anger”, $\alpha = .80$, Bamberg et al., 2015).

“Where the two percentages did not add up to 100%, we rounded them to total 100% and excluded cases in which the combined percentage were below 85%.” -> Please indicate in brackets how many cases needed to be rounded/excluded.

As suggested, we added the cases in brackets and further clarified that not the participants were excluded but only their responses on this respective variable.

For 19 participants, the two percentages did not add up to 100%. For twelve participants where the combined percentage fell below 85%, we treated these as invalid responses and missing values. For the remaining seven participants, we rounded them to total 100%.

I would like the authors to critically assess whether this claim is backed up sufficiently: “aligning with evidence that activists typically report higher wellbeing (Vestergren & Drury, 2021).” -> In my own research (nothing I can share at the moment) and my personal experience I find that activists can also be systematically unhappier than non-activists, as they have left behind the blissful ignorance some others live in

Thank you very much for this suggestion! In fact, some of our recent and unpublished work aligns with your cautious note. We’ve now deleted the latter part of the sentence and applied a more cautious phrasing in an earlier part of the manuscript.

While in these examples, activism itself can be portrayed as the root cause of activist burnout, evidence suggests that volunteering and activism may be positively associated with life satisfaction and wellbeing (Binder & Blankenberg, 2016; Vestergren & Drury, 2021; Hope et al., 2018; see also Vestergren et al., 2017, 2019).

Please eliminate causal wordings, such as X predicted activist burnout, from the manuscript, given that you ran a correlational study.

We did not want to give a false impression about the (lack of) causality of our findings. This is why we changed the wording from „predictor“/ „factor“ to „variable“/ „explain“/ „aspect“/ „associated/ related/ linked“. In our view, wording in cross-sectional studies such as ours carries the difficulty that the term „correlation“ may lead to the false impression that we only looked at bivariate relations, whereas the label of a (statistical) „predictor“ can be interpreted falsely by someone not familiar with our methods. We think that the manuscript now strongly clarifies the cross-sectional nature of our studies.

Minor:

Just a small wording issue, but I do not think that there are “resilient forms of collective action”. Perhaps what you want to say is that activists seek to develop resilience towards stressor commonly linked to collective action, as well as sustainable manners of engagement in collective action.

This is a good point and we adapted the sentence, further highlighting that certain stressors are inherent to collective action.

Moreover, many engaged individuals do not want to leave but rather seek resilience against the stressors inherent in collective action (Hamann et al., 2025).

In Study 2, I am a bit surprised that the study was advertised internationally, but only German-speaking respondents participated?

We initially aimed to collect both German- and English-speaking samples to enable replication in an international context. The study was conducted as part of an international project, with project partners supporting data collection. However, as our networks are concentrated in Germany, our recruitment yielded a larger German-speaking sample. As indicated in the manuscript:

As only 57 (10.5%) respondents completed the English questionnaire, we restricted the main analyses to the German sample (N = 486).

Due to this imbalance and the small sample size that did not allow to analyse our hypotheses, we restricted our main analyses to the German sample.

How did participants report their paid engagement? Did they indicate a sum of money they were making? This remains unclear from your description (line 260).

Great question – participants only had to indicate the hours spend on their paid engagement and not the salary. We rephrased the respective parts, provided an example and hope that they are unambiguous now.

Study 1

Moreover, they reported how many hours they were voluntarily engaged and how many hours they were paid for their engagement in their main initiative by an open quantitative indication. The latter variable was dichotomized to compare participants who were paid at least partly for their engagement with those that weren't.

Study 2

Other than in Study 1, however, participants were asked to indicate the percentage of their engagement that was voluntary versus paid (e.g., “Of the hours mentioned in Question 1, what percentage of your engagement last year was voluntary and what percentage was paid?” Voluntary: X%, Paid: X%).

Comments by Reviewer B

Authors' Response to the Reviewers Round 1

The submitted manuscript “Building Movement Resilience: Structural and Psychological Predictors of Burnout Among Environmental Activists” studies psychological and structural factors related to burnout among environmental activists across two studies. Both studies employ a cross-sectional questionnaire approach, with Study 1 building on the results of Study 1 by including a wider range of potential psychological predictors of activist burnout. The results show that those who spend more hours on activism and those who are paid to do so report higher levels of activist burnout, whereas those with higher levels of social identification and personal self-efficacy related to their engagement report lower levels of activist burnout. The manuscript provides invaluable insights for this emerging research field as it gives first indications of the relevance of a wide range of both structural and psychological factors that may act as risk or protective factors for activist burnout, having both theoretical and practical implications. The research is well embedded within the literature and I recommend publication upon considering the comments outlined below.

Thank you very much for appreciating our work and its theoretical basis, and for providing these valuable comments. We trust that we have adequately addressed and clarified each of the issues you identified.

I recommend that the authors reconsider the use of causal language when describing their research, given that the cross-sectional design precludes strong causal inferences based on the results in their current form. In particular, the title and abstract read as relatively causal due to terms such as “predictors of...”, “positively predict”, and “protective factors”. I believe that more neutral terms such as “associated with” and “correlates of...” would be more appropriate for cross-sectional data.

We did not want to give a false impression about the (lack of) causality of our findings. This is why we changed the wording from „predictor“/ „factor“ to „variable“/ „explain“/ „aspect“/ „associated/ related/ linked“. In our view, wording in cross-sectional studies such as ours carries the difficulty that the term „correlation“ may lead to the false impression that we only looked at bivariate relations, whereas a the label of a (statistical) „predictor“ can be interpreted falsely by someone not familiar with our methods. We think that the manuscript now strongly clarifies the cross-sectional nature of our studies.

It may be advisable to clarify the definition of activist burnout in a way that aligns more closely with the measures used in both studies. In the introduction (p. 3), activist burnout is described as “a state in which long-term physical, emotional, and motivational stressors erode an activist’s ability to stay engaged in a collective action group.” This definition does not seem to map neatly onto the measures used in Study 1 and Study 2. In Study 1, activist burnout is assessed with a two-item self-report measure that relies on participants’ own understanding of what burnout entails (e.g., “I feel burnt out by my environmental (volunteer) work.”). In Study 2, the measure

is more extensive and covers emotional exhaustion, depersonalization, and (struggles with) personal accomplishment. However, the central element of the introduction's definition — “eroding an activist's ability to stay engaged in a collective action group” — does not appear to be directly assessed in either measure. This raises the question of what is actually being captured in the present studies: is it activist burnout as defined in the introduction, or rather emotional exhaustion and related dimensions that may contribute to burnout? A clearer alignment between the conceptual definition and the operationalization would strengthen the manuscript.

Excellent point! We completely agree. In our understanding and how we assessed activist burnout, the potential for eroding an activist's ability to remain engaged should not be viewed as part of activist burnout but be conceptualized as a distinct construct and likely outcome of activist burnout. We now instead focus on a more quantitative-psychological definition of burnout by the APA and dropped the definition of previous qualitative work on activist burnout, while keeping their valuable insights to explain the concept further.

Conceptually, burnout is a syndrome of prolonged work-related emotional and physical exhaustion, depersonalization, and decreased personal efficacy (Maslach & Jackson, 1981). Research on activist burnout applies this notion to the area of collective action (i.e., coordinated action that individuals undertake as group members with the purpose of achieving collective aims, Agostini & van Zomeren, 2021; Hamann et al., 2024; Wright et al., 1990). Building on this work and the APA's (n.d.) definition of burnout, we define activist burnout as physical, emotional, and mental exhaustion from engagement in collective action groups. Qualitative evidence underscores the multifaceted nature of activist burnout. For example, interviews with human rights activists reveal that such exhaustion can manifest in physical symptoms (e.g., chronic insomnia, eating disorders, and migraines), psychological and emotional symptoms (e.g., chronic stress, anxiety, and depression), and motivational symptoms (e.g., hopelessness, despair, and perceived ineffectiveness, Chen & Gorski, 2015).

Relatedly, I do find the findings concerning more general well-being (PANAS in Study 1 and 2, and Satisfaction with life, Subjective vitality etc.) interesting — especially given that they seem to mirror the findings concerning activist burnout, even though they are domain general. I wonder what these findings may reveal about this group of individuals engaged with societal issues, and whether they are more broadly applicable to efficacy beliefs and identification with the topics, causes, or work people engage in.

We agree that this is a highly interesting finding. Further considering the literature known to us, the finding fits to the social cure perspective that posits that group membership, by itself, already has a supportive function for people's wellbeing by providing them, for example, with meaning and self-esteem. We added one sentence on this to our discussion.

Exploratory analyses from Study 2 further underscore the robustness of this association across health-related outcomes and context-independent indicators of wellbeing (i.e., depersonalization, lack of personal

accomplishment, satisfaction with life, and subjective vitality). In line with the idea of social identities as a social cure (Haslam et al., 2018), group membership in the socio-ecological movement may provide people with psychological resources that promote wellbeing beyond the specific context of their engagement.

Introduction/Background

The introduction and background section of the manuscript is clear and thorough: The presented research is adequately embedded into a review of previous research, and the most relevant literature for the research question at hand is referred to.

Thank you for acknowledging our work aiming to detect all studies relevant to the specific context of activist burnout.

More a question than a point: The previous finding of involvement in more than one initiative being related by activist burnout discussed on p. 5 made me wonder whether it could also be the type of involvement that is of relevance. While the definition of engagement presented to participants does preclude those with minimal involvement, involvement in different types of movements or groups may still play a role in exposure to different stressors. For instance, those who organise and join direct actions may be exposed to police violence, which could be related to emotional exhaustion.

Agreed – in fact, another very brief publication emerged from Study 2 in which we distinguished five different roles in a movement: Normative rebels, non-normative rebels, educators, reformers, change agents. The scales for these roles were self-generated and adapted from an activist movement theory, yet they also mirrored more classic collective action scales (e.g., „In the last year, I have organized legal socio-ecological protest events (e.g., demonstration, boycott).“). Similar to you, we would expect certain movement roles (e.g., people involved in civil disobedience) to be more at risk to develop burnout.

Empirically, we had not connected this data with activist burnout yet. So we observed the correlations and were surprised to find that activist burnout did not correlate significantly with any of the mentioned scales (normative rebel: $r = .07$; non-normative rebel: $r = .05$; educator: $r = -.06$; reformer: $r = -.02$; changemaker: $r = -.08$).

We then went back to Study 1 to investigate the correlation of activist burnout and a typical collective action scale assessed in this study. Here, the correlation was significant with $r = .23$. One interpretation of this finding could be that activist burnout indeed does not have to do with a specific role and associated activities, but rather with the accumulation of too many tasks. The accumulation of tasks was better captured in our engagement hour measure as well a collective action scale in Study 1 comprised of 18 items (including, e.g., petitioning, protesting, joining environmental groups, using online and traditional collective methods to promote environmental protection). While our movement roles were only assessed with two items each – they were therefore more indicative of a particular role and how much a participant invested into that specific role. Yet, they were less indicative of accumulating numerous tasks within an

organization potentially connected to diverse roles (e.g., organizing events, being responsible for finances, and for including new members at the same time). Another interpretation could be that the time span of the role-specific scale (1 year) as compared to the collective action scale in Study 1 (3 months) was too long to find associations with activist burnout, a concept that may fluctuate quite a lot depending on current projects and demands.

We did not include these additional analyses and thoughts yet, as they go somewhat beyond the initial research question. However, if you think they need to be integrated into the supplements, we're happy to do so.

In the introduction of Study 2 (p. 12), the authors mention that they got feedback from participants in Study 1, could this be elaborated on? In what form was this feedback received? Similarly, what is meant by broader identity levels in this context? And how do they relate to the examining of “predictors and health outcomes regarding general engagement within the socio-ecological movement”? Does this allude to the broader definition of engagement used in Study 2 as compared to Study 1?

As you and Reviewer 1 noted, this point clearly needed to be explicated further. In fact, the term identity levels was misleading here, even though identification with an initiative and identification with the socio-ecological movement may be nested identities. To avoid irritation, we now simply speak of „identities“, explicated that the socio-ecological movement is the central identity in Study 2, and expanded on the feedback leading to this decision.

Here is an exemplary feedback that we based our decision on: "I find the term 'environmental initiative' an unfortunate choice. Although I answered everything as 'environmental initiative,' I'm actually involved—aside from my local NABU membership—privately and in loose association with like-minded individuals, actively in wildlife rescue and wildlife protection."

Second, we aimed to test the stability of our findings across different identities. Study 1 centered on identification with participants' main environmental initiative. We evaluated our open comment section and some participants noted that they were not necessarily active in one main initiative but rather engaged in many loose networks. Moreover, we received verbal feedback by a participant who suggested that their main initiative played a relatively minor role in their motivation and potential burnout compared to broader identities. For identity processes to unfold their power, it is crucial to target identities relevant to an individual (Fritzsche et al., 2018). Accordingly, we chose the broader socio-ecological movement as an identity reference group in Study 2.

To measure aim-focused efficacy beliefs with three items each, we used similar measures as in Study 1, adapted to the new reference group of the socio-ecological movement.

Some minor points for improvement:

P. 3 “It therefore does not come as a surprise that environmental activists themselves identified burnout and emotional coping as pressing concerns for psychology in qualitative interviews (Hamann et al., 2025).” – To me it is not completely clear what is meant here as a pressing concern for Psychology. Maybe this can be re-formulated?

Agreed – we reformulated this sentence, so that it is more precise.

It therefore does not come as a surprise that environmental activists themselves identified burnout as a relevant research area for psychology in qualitative interviews (Hamann et al., 2025).

P. 6 “receipt of payment” sounds a bit odd, maybe it could be changed to “being paid for...”

This is a good point and we assume that Reviewer 1 was also confused by this wording, asking whether participants also had to indicate how much money they were paid. To shift the focus from receiving to being paid, we changed several instances to your proposed phrasing.

Methods

The research design is suited to address the research question at hand, with Study 2 replicating and extending Study 1 by including a wider range of psychological factors that may be related to activist burnout. The materials used are described at a level of detail that allows replication by others. Some small details could be added to improve this even more:

Thank you for this evaluation.

This might be a personal preference, but I would recommend including at least one example item per construct described in the main text (e.g., positive affect, social identification). This allows the reader to get a better grasp of how a construct is measured without having to consult the supplementary materials and could be done in a table.

Thank you for pointing out that example items are needed to increase readability of our method sections. We added an exemplary item for each measure used in Study 1 and Study 2. The sections now read, for example,

Psychological variables. Reflecting Study 1, three items measured social identification with the movement for a socio-ecological transformation, and we added a fourth item for perceived involvement following Feitosa et al. (2012, “I feel involved in what is happening in the movement”, $\alpha = .83$). We assessed evaluations of affective injustice with three items (“When thinking about what the government and economy currently do to stop socio-ecological crises, I feel outrage/ rage/ anger”, $\alpha = .80$, Bamberg et al., 2015).

Secondly, some of the items of certain constructs load on different factors, most notably the activist burnout scale used in Study 2. It would be of interest to know which items were included in which factor score, especially given that one of the factors (emotional exhaustion) was used as the primary outcome variable.

This is a valid point. To facilitate replicating our work, the supplements now include items with the respective scales in brackets. To be precise, we observed three items with unexpected patterns:

- Item 16 („Being in direct contact with people in my engagement is too stressful for me.“) loaded on personal accomplishment instead of emotional exhaustion.
- Item 21 („In my engagement I am very relaxed when dealing with emotional problems.“) loaded on emotional exhaustion instead of personal accomplishment.
- Item 20 did not load on any scale („I feel as if I’m at my wits’ end.“)

As all scales, by itself, showed good item and scale properties (e.g., all item-scale correlations were $r > .50$), we decided to still stick with the original and theory-driven structure. By adding a part to this sentence, we hope that it is now clear for readers as well.

Keeping the originally proposed item-scale allocations, nine items assessed emotional exhaustion (e.g., “I feel worn out at the end of a day full of engagement”, $\alpha = .84$).

Third, it would be relevant to know how the study was presented to participants, especially given that the data reported in Study 1 was collected as part of a larger longitudinal study. Concerning sampling, the authors used a variety of channels to recruit participants. If possible, it would be relevant to report via which channels participants came across the survey. Moreover, given that in Study 1 only those participants who reported active engagement in an environmental initiative were included, it might be of interest to know how the sample differs from the full sample of Wave 2 ($N = 892$ vs. $N = 268$). Fitting with point 3.2.3, depending on how the study was presented to participants the finding that 30% of participants report active engagement in an environmental initiative might be quite high.

Thank you for your interest in our data collection. Unfortunately, we did not track which channels participants followed to participate in our study. Yet, thanks to your comment, we noticed that our current manuscript lacked the relevant information that our advertisement targeted particularly environmentally engaged individuals as, with Study 1, we were interested in comparing an activist with a non-activist but also environmentally inclined sample as part of the longitudinal study. Now, we added this information on two instances.

Study 1:

The Wave-1 questionnaire was distributed in German and English via mailing lists, Facebook groups, and survey-exchange platforms, with a particular focus on environmental groups and channels.

Study 2:

Over a four-week period in June 2021, we collected data internationally via SoSci survey (Leiner, 2020), distributing the survey through mailing lists, websites, and personal contacts, focusing on environmental groups and channels.

Additionally, in order to allow a direct replication, we assumed that others may want to adapt our advertisement as well, so we added it to Supplements A4 and A11. In order to reach environmentally engaged individuals, the tone is encouraging and we made use of one nature picture in each study to attract attention on social media.



Name of NGO that posted our advertisement

May 4, 2018 · 🌐

Dear Sustainability Advocates,

for my study, I'm explicitly looking for environmentally engaged and interested people - it would be wonderful if you could support me! The long-term study on efficacy and environmental protection includes 4 questionnaires with 15-20 minutes each. It would help me a lot if you participated 😊

www.soscisurvey.de/panelenveff/?q=baseE

For your participation, you'll receive an individual evaluation and a chance of winning a 200€ (244\$/175£) and several 50€ vouchers!

A big Thank You in advance!

Study

Efficacy & Environmental Protection



Format? 4 questionnaires with 15-20 minutes each

Chance of winning? One of one 200€ (244\$/175£) voucher and six 50€ vouchers & individual evaluation

Gift Card

You and 4 others

5 comments

Like

Comment

Share

As for the difference from the full Wave 2 sample, we went back to our original data to better characterize our current sample. Notably, the whole German-speaking sample were $n = 865$ participants, of which a total of $n = 317$ were engaged in an environmental initiative. This relatively high number of individuals actively engaged was due to our sampling strategy targeting socio-ecological groups as well as a much larger dropout of non-engaged than engaged participants in Wave 2. The burnout measure used in Study 1 was part of an additional 5-minute questionnaire that participants could answer after finishing the primary questionnaire. A total of 706 (82%) participants took part in our extra-questionnaire, indicating a highly committed sample. As the task of filling out this extra-questionnaire may be associated with

particular beliefs and traits, and could for itself be characterized as a pro-environmental behavior, we decided to use only those participants for comparison. This led to $N = 268$ engaged participants as our study sample and $N = 438$ participants non-engaged participants as a comparison group. We included these comparisons that served as further characterization of our sample, in the Supplements.

A3. Comparison of engaged and non-engaged sample in Study 1

To further characterize our engaged sample, we conducted analyses comparing them to participants who completed the extra-questionnaire but indicated no engagement in any environmental initiative. Compared to non-engaged participants, our sample scored significantly higher on nearly all pro-environmental belief measures central to our study. As expected, engaged participants reported stronger environmental self-identity ($M_{engaged} = 5.98, SD_{engaged} = 0.81, M_{non-engaged} = 5.29, SD_{non-engaged} = 1.11, t(684) = 9.51, p < .001$) and personal self-efficacy ($M_{engaged} = 5.38, SD_{engaged} = 0.98, M_{non-engaged} = 4.90, SD_{non-engaged} = 1.15, t(631) = 5.96, p < .001$). Moreover, engaged participants were on average older ($M_{engaged} = 1984.44, SD_{engaged} = 13.20, M_{non-engaged} = 1987.83, SD_{non-engaged} = 10.67, t(472) = -3.53, p < .001$) and more likely to be male (coded as female = 1, male = 2; $M_{engaged} = 1.31, SD_{engaged} = 0.46, M_{non-engaged} = 1.24, SD_{non-engaged} = 0.43, t(518) = 2.00, p = .046$). All analyses employed Welch's t -test due to significant Levene's tests for equality of variances.

We explored additional measures not central to the main research question and found no significant differences in identification with all humanity ($M_{engaged} = 5.39, SD_{engaged} = 1.16, M_{non-engaged} = 5.48, SD_{non-engaged} = 1.18, t(704) = -1.01, p = .315$) or collective efficacy of all humanity ($M_{engaged} = 6.20, SD_{engaged} = 0.77, M_{non-engaged} = 6.10, SD_{non-engaged} = 0.88, t(704) = 5.74, p = .110$). However, as assumed, engaged participants reported significantly more private pro-environmental behavior ($M_{engaged} = 5.89, SD_{engaged} = 0.54, M_{non-engaged} = 5.39, SD_{non-engaged} = 0.70, t(666) = 10.62, p < .001$) and activist pro-environmental behavior ($M_{engaged} = 2.29, SD_{engaged} = 0.65, M_{non-engaged} = 1.39, SD_{non-engaged} = 0.42, t(408) = 20.27, p < .001$), with Welch's t -test applied for both comparisons.

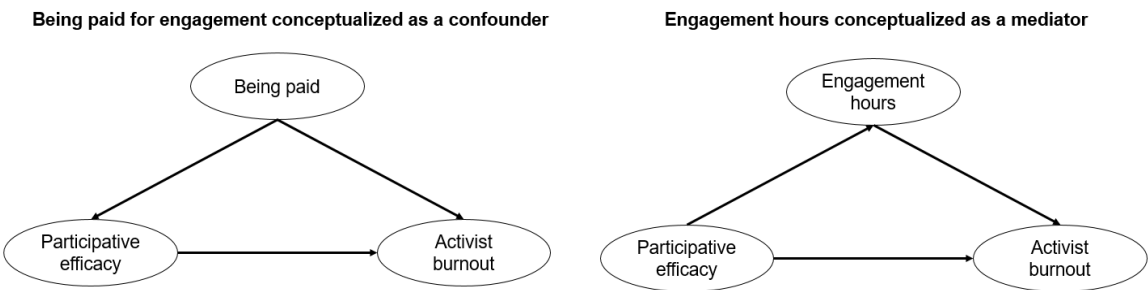
The data preparation and analysis section was clear, and data exclusion criteria were mentioned. The only point that could be explained even more clearly is one made on p. 7: The authors argue that they model predictor sets separately because being paid for one's engagement may be associated with a particular kind of individual. I am not completely convinced by this reasoning, and I wonder whether this point could be elaborated. Additionally, would it be a possibility to find out whether the participants who are being paid actually differ on certain characteristics, by looking at descriptives and/or running some exploratory analysis comparing the groups. Looking at Table 1 also does not give clear indications that these variables would be systemically related with the psychological predictors of activist burnout.

Thank you for this suggestions which we gladly implemented.

We took the decision to investigate structural and psychological factors separately before conducting the analyses. At that point, we expected key structural variables to be correlated with psychological variables. Precisely, we assumed participants that were paid for their engagement to report more collective efficacy (as initiatives with more opportunities to pay their members may actually be more effective), participative

efficacy (as people who are paid within initiatives typically take responsibility roles) and identification with the initiative (due to the financial bond with the initiative). Moreover, we assumed that participants who were involved in more initiatives would report lower collective efficacy, participative efficacy, and identification with the main initiative, as they are also emotionally and effectively invested in other initiatives.

If a structural variable correlated with both a psychological variable and activist burnout, there was the chance that it would constitute a confounder and mask the association between the two. This may be especially problematic if the potential confounder is a rather stable variable while psychological variables are more dynamic. This stable variable may maximize our prediction but it could also mask psychological mechanisms that are more interesting from a causal perspective. Or in other words: Based on theoretical considerations, we conceptualized being paid as a confounder and engagement hours as a mediator.



To verify our assumptions about group differences, we conducted group comparisons as you suggested. In Study 1, paid and non-paid participants did not differ significantly on relevant variables such as self-efficacy, collective efficacy, participative efficacy, identification with the initiative, and environmental self-identity ($p > .05$, as reflected in the correlation table). While the number of initiatives significantly correlated with collective efficacy ($r = .15$), participative efficacy ($r = .18$), and environmental self-identity ($r = .15$), this variable was not associated with burnout when other factors were considered. Thus, including all variables in the same analysis did not alter the results.

DV: Activist burnout				
	B	SE	β (95%-CI)	p
(Intercept)	4.70	0.71	0.00 (-0.11, 0.11)	<.001
Engagement (vol)	0.05	0.01	0.26 (0.15, 0.37)	<.001
Engagement (pay)	0.98	0.20	0.27 (0.16, 0.38)	<.001
Initiative numbers	0.06	0.07	0.05 (-0.06, 0.16)	.400
Pers. self-efficacy	-0.26	0.09	-0.22 (-0.37, -0.08)	.003
Collective efficacy	0.01	0.12	0.01 (-0.16, 0.18)	.935
Participative efficacy	0.11	0.11	0.09 (-0.09, 0.27)	.334
ID initiative	-0.35	0.09	-0.23 (-0.34, -0.11)	<.001
Env. self-identity	0.02	0.11	0.01 (-0.11, 0.13)	.879
$R^2 = .228$				
$F(8, 259) = 9.53^{***}$				

In Study 2, however, we found one of the expected patterns. Participative efficacy was stronger among those paid for their engagement than among those that were not ($t(472) = 2.64, p = .009$). Additionally, we found significant differences between paid (vs. non-paid) participants regarding descriptive norms of friends ($t(472) = 2.78, p = .006$) and family ($t(472) = 3.63, p < .001$), affective injustice ($t(472) = -2.87, p = .004$), moral convictions ($t(471) = -2.75, p = .006$), enhancement and protective motivation ($t(472) = -2.70, p = .007$), and competence need satisfaction ($t(472) = 2.03, p = .043$). Levene’s test was significant for career and understanding motivation, which is why we performed Welch’s test for group comparison. There were significant differences between career motivation ($t(421) = 7.23, p < .001$) and understanding motivation ($t(432) = 2.18, p = .030$). All other variables showed no significant differences ($ps > .05$). Including all variables in the same analysis changed the results in that personal self-efficacy was not significantly associated with activist burnout anymore.

DV: Burnout (exhaustion)				
	B	SE	β (95%-CI)	p
(Intercept)	3.83	0.38	0.00 (-0.09, 0.09)	<.001
Engagement (vol)	0.01	0.00	0.09 (0.00, 0.18)	.057
Engagement (pay)	0.24	0.08	0.13 (0.04, 0.22)	.004
ID movement	-0.19	0.08	-0.18 (-0.28, -0.07)	.001
Personal self-efficacy	-0.09	0.05	-0.11 (-0.23, -0.02)	.086
Collective efficacy	0.05	0.06	0.06 (-0.06, 0.17)	.337
Participative efficacy	-0.05	0.05	-0.06 (-0.18, 0.06)	.303
DN friends	0.03	0.03	0.05 (-0.04, 0.14)	.277
DN movement	0.03	0.03	0.05 (-0.05, 0.14)	.320
VM integrated	-0.01	0.05	-0.01 (-0.11, 0.09)	.893
$R^2 = .084$				
$F(9, 461) = 4.67^{***}$				

At this point, we are a little bit hesitant to alter our reported analyses at this stage as they were planned differently. Moreover, our underlying concerns of testing stable structural variables and dynamic psychological variables in the same model remains, even though it only led to small changes in results.

This is why, in the revised article, we have now focused on extending our argument on why to separate structural and psychological factors in this case, added tables including both set of predictors to the supplements, and refer to them in the results sections.

We chose to model structural and psychological aspects separately, as our main interest lay in exploring the psychological mechanisms underlying activist burnout, with an eye toward developing future causal models based on our findings. Hamaker et al. (2020) emphasize the importance of distinguishing specific research aims (description, prediction, explanation) and variable types (dynamic, stable, time-invariant). While incorporating a broad array of variable types may be a suitable strategy to maximize prediction, it does not necessarily advance our understanding of the causal and dynamic processes leading to an outcome. In this

study, stable structural variables (e.g., being paid for engagement, number of initiatives) could therefore constitute potential confounders that may affect both psychological variables and outcomes, thereby obscuring their association (see also Wysocki et al., 2022). For instance, being paid for engagement could foster participative efficacy by affording individuals a more significant organizational role, and may also exert a distinct influence on burnout. This dual association could mask the genuine relationship between participative efficacy and burnout.

Accordingly, Model 1 only included structural variables. Model 2 included psychological variables and controlled for total engagement hours – a dynamic, potential mediating mechanism. Without controlling for it, we would possibly have found the same variables associated with collective action to be associated with activist burnout. Yet, to gain insight into the characteristics of resilient engagement, we were interested in the association with psychological variables irrespective of individuals' engagement level.

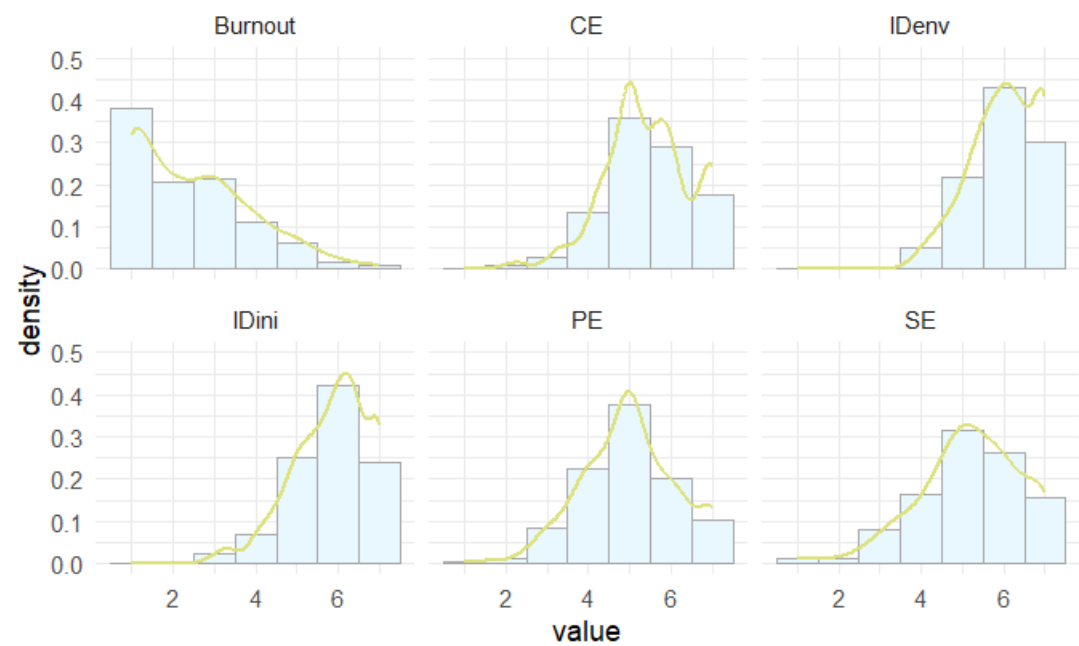
However, if the editor and reviewers think that it would be necessary to change the analysis to regression models including both types of variable, we're open to changing it accordingly.

Moreover, if you think that it is worth reporting group differences in the supplements, we are happy to include them.

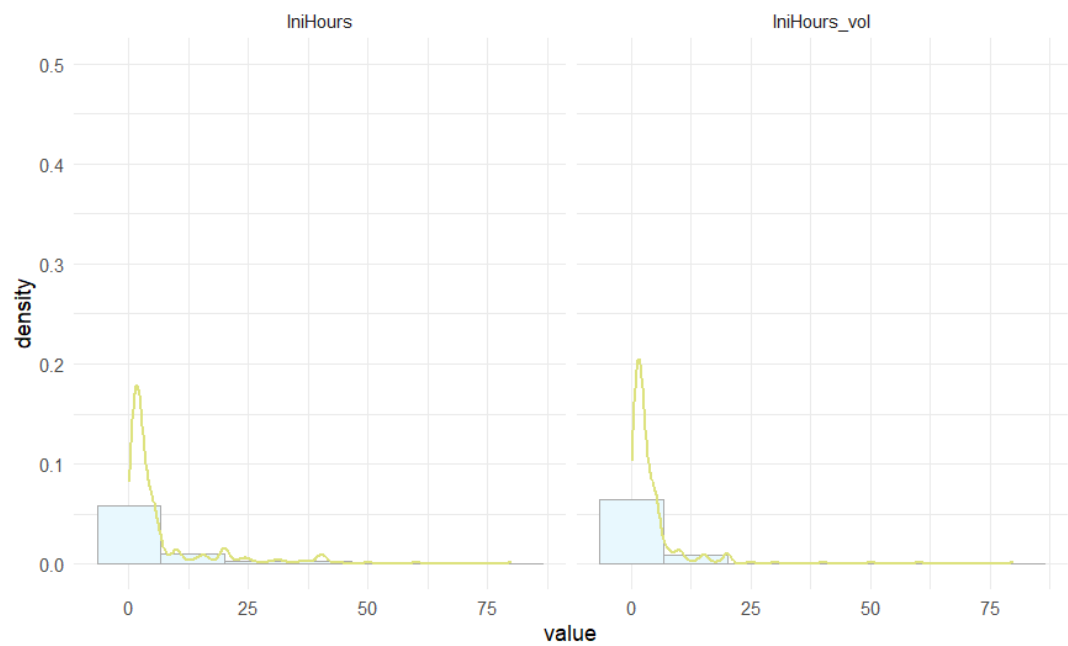
I do believe that providing some visual inspection of key variables might be beneficial, for instance: How is engagement in hours distributed? Are there some individuals who engage a lot, whereas others report minimal engagement?

We are grateful that you pointed out these visuals may be of special interest to our readers, so we added them to the supplements (see below). All of them and further descriptives are featured in our R html output. As expected, engagement hours showed a skewed distribution with many participants reporting fewer hours and only some reporting a many hours. Our interpretation of these values is that they can indeed be valid (e.g., members living in an ecovillage, so that almost every waking hour is regarded as engagement). To check the robustness of our findings, we repeated main analyses with engagement hours and voluntary engagement hours as square- or log-transformed scales and results did not change substantially.

Study 1

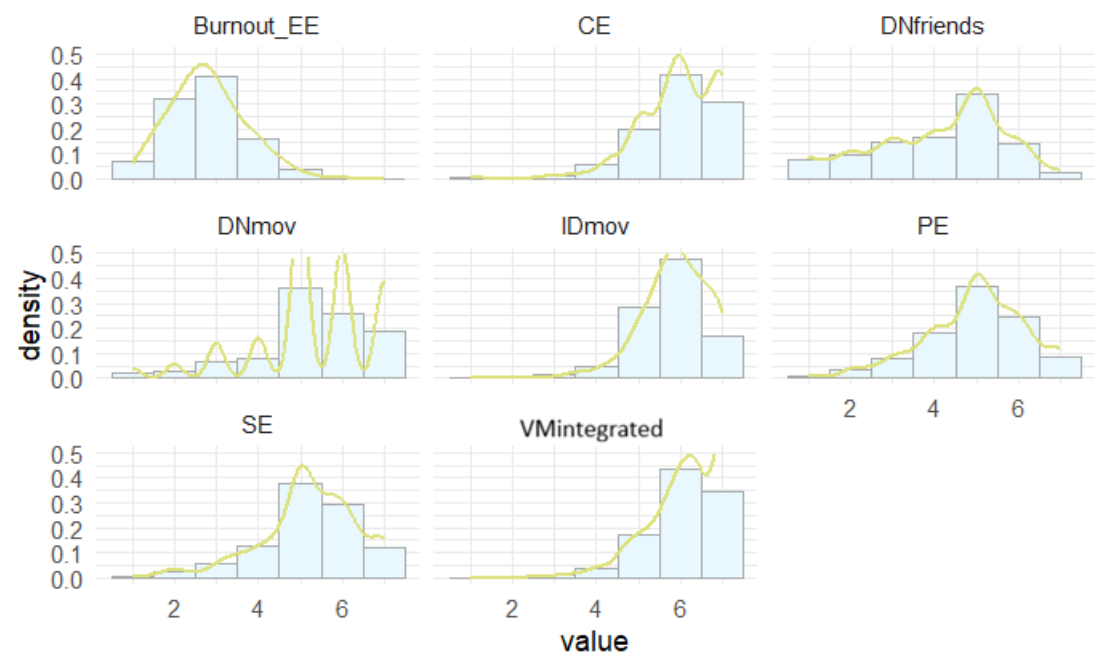


Note. CE = collective efficacy, IDenv = environmental self-identity, IDini = identification with the initiative, PE = participative efficacy, SE = personal self-efficacy.

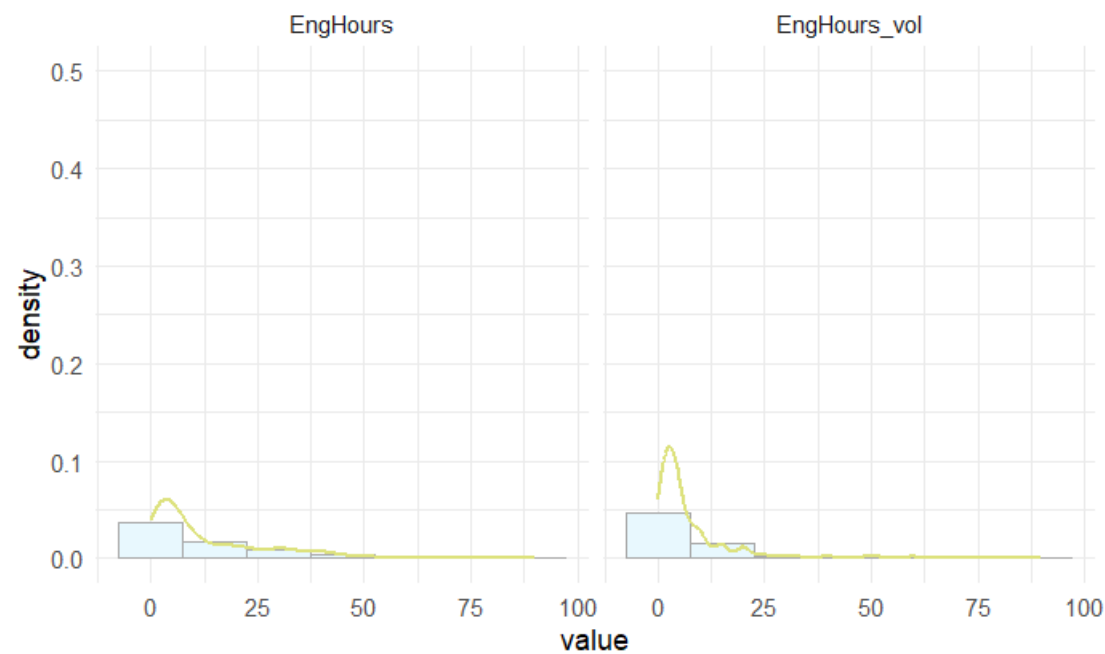


Note. IniHours = total engagement hours, IniHours_vol = voluntary engagement hours.

Study 2



Note. Burnout_EE = Burnout (exhaustion), CE = collective efficacy, DNfriends = descriptive norms of friends, DNmov = descriptive norms of movement, IDmov = identification with the movement, PE = participative efficacy, SE = personal self-efficacy, VMintegrated = integrated volunteer motivation.



Note. EngHours = total engagement hours, EngHours_vol = voluntary engagement hours.

The results section is clearly structured, making a difference between confirmatory and exploratory results. The description of data and statistical hypothesis tests are complete. All tables and figures are informative and comprehensible.

Thank you for acknowledging our reporting efforts.

For the Results section of Study 2, it would be beneficial to spell out what is meant with activist burnout as the outcome variable – which is, if I understand correctly – emotional exhaustion.

Agreed – we support the idea to be more precise in our wording and changed it to emotional exhaustion in the Results and Discussion sections of Study 2.

Minor point: I was missing the exploratory results in the Discussion of Study 2, I understand why this is done but do believe that adding one short sentence highlighting the exploratory findings might be valuable here.

We gladly added two sentences on our exploratory findings, highlighting the topics that you indicated as most interesting.

Explorative analyses revealed other variables that could explain emotional exhaustion (e.g., affective injustice, autonomy frustration, and intrinsic motivation). Furthermore, movement identification demonstrated robust negative associations with multiple burnout dimensions and positive associations with wellbeing outcomes.

Discussion

The authors make a clear distinction between confirmatory and exploratory findings, meaning that speculations are acknowledged as such and conclusions follow from the presented results.

Thank you.

I wonder whether the sample could explain some differences of findings of activist burnout found in previous literature. Specifically, the definition of activism used in the current study is quite broad, and might be broader than in previous (qualitative) studies. Is there any indication, for instance from previous literature, showing that different types of engagement are predicted by different motivational factors and may be differently related to burnout? And if so, how do your results speak to this?

This is an interesting thought. In fact, our sample included individuals that were minimally engaged while previous qualitative work focused mainly on participants who had already experienced burnout and were likely highly engaged. Concerning your second question: As described above, we looked into associations between our activist role scales and burnout but did not find any meaningful patterns. However, future

studies should look into this more systematically and quantitatively. We decided to add this point as a limitation leading to future directions.

Third, although our assessment of activist burnout was comparatively narrow, our sampling strategy was quite broad. Whereas prior qualitative research often centered on activists who had already experienced burnout, possibly due to extensive workloads, our study focused on environmentally engaged individuals with varying levels of involvement. As a result, important questions remain as to which forms of engagement are most strongly associated with activist burnout and under what conditions burnout leads to a complete withdrawal from engagement. Future research should incorporate variables that better delineate sample characteristics (e.g., main engagement tasks, environmental domain, previous burnout experience) to allow for more nuanced connections with burnout outcomes.

The discussion point about affective injustice is very interesting and could be extended. For instance, how does the repeated exposure to contexts that evoke anger relate to the operationalization of affective injustice used in the current study (p. 20)?

As suggested, we extended the discussion about affective injustice as we think that this part is especially relevant for future research. Thereby, we highlighted that a distinction of anger targets (connected to varying degrees of repeated exposure) may be interesting in this area as well.

Our study focused on anger directed at the government and economy, so the association with burnout could be attributed to outrage about slow progress resulting from lack of reform (see Gomes, 1992). Previous research has explored other targets of anger (Gregersen et al., 2023). We would expect comparable findings for anger directed at people and their actions, or humanity as a whole, as such forms of anger may be connected to the depersonalization dimension of burnout.

As mentioned in earlier points, I believe that both the conceptualization of burnout used in the current study as well as the definition of activism could be discussed in more detail in the discussion, as both may have influenced the findings and may explain differences with previous literature.

This is true. We considered whether discussing these topics in light of our findings would be useful. We therefore considered hypotheses that were not met and also checked curvilinear associations between variables and activist burnout in order to detect nonlinear effects that could be due to our broad sample. Yet, none of them were significant, and unexpected results were not easily interpreted using these arguments. Thus, we decided to include both points in the limitation section, so that they can inspire future research.

Second, it is important to note that our definition of activist burnout was derived from psychological research (APA, n.d.) rather than from the qualitative interviews that informed our hypotheses. These interviews adopted a considerably broader understanding of burnout, including physical and emotional symptoms –

some of which we conceptualized as explanatory variables (e.g., low personal self-efficacy). Despite these differences, some of the hypotheses most strongly emphasized in interviews were supported by our quantitative results (e.g., concerning social identification). Given these conceptual differences and existing critiques of the MBI (Shoman et al., 2021), future studies may benefit from considering alternative burnout inventories, including instruments that more comprehensively capture physical symptoms.

Third, although our assessment of activist burnout was comparatively narrow, our sampling strategy was quite broad. Whereas prior qualitative research often centered on activists who had already experienced burnout, possibly due to extensive workloads, our study focused on environmentally engaged individuals with varying levels of involvement. As a result, important questions remain as to which forms of engagement are most strongly associated with activist burnout and under what conditions burnout leads to a complete withdrawal from engagement. Future research should incorporate variables that better delineate sample characteristics (e.g., main engagement tasks, environmental domain, previous burnout experience) to allow for more nuanced connections with burnout outcomes.

Practical impact

The practical implications have been made explicit, and they do follow from the presented results.

Open science

Open science practices have been followed, including information on how they determined their sample sizes, measures, and information about data exclusion, as well as indicating which analyses were confirmatory and exploratory.

We thank you very much for this evaluation.

Further revisions

Label of our study sample

Based on the comments of the reviewers (e.g., our sample being broader than samples from qualitative studies), we noticed that the term „activist“ may not represent all participants. From the outside, they may be described as activists in a sense that all are actively engaged in politicized groups. However, from the inside, not all may self-identify as activists, especially those that do not protest but practice other forms of engagement. Therefore, we changed our sample labeling while keeping „activist burnout“ as an already established term.

Power analysis

Following further discussions with the co-authors, we would like to make one additional revision to our manuscript and add two sentences that explicate how our sample sizes allowed us to test the hypotheses under the assumed power and effect size.

In Study 1, our actual sample size of $N = 268$ exceeded the requirement for detecting a medium effect size when simultaneously including three independent variables each in the analyses for H1 and H2 ($N = 119$ required). For Study 2, the sample included $N = 483$ participants, which was sufficient to detect a medium effect size for analyses involving two independent variables (H1, $N = 107$ required), three independent variables (H2, $N = 119$ required), eight independent variables (H3, $N = 160$ required), and for more explorative analyses with up to twenty independent variables ($N = 222$ required).

Supplements

Following a comment by R1, we noticed a translation error in our Supplements and changed it accordingly.

If paid work in an environmental initiative feels like engagement, it also counts as “active engagement”.

Review Round 2

Comments by Reviewer A

Authors' Response to the Reviewers Round 2

I would like to thank the authors for giving me the opportunity to re-evaluate their manuscript. I commend the authors on the substantive changes made to the manuscript. The time and effort invested in the revisions is clearly reflected in the manuscript and response letter and I think the manuscript is now fit for publication.

Thank you very much for this evaluation and acknowledging the effort that we put into our revision.

Two brief remarks:

Regarding the information on how many participants were paid/for how many hours of their engagement, I indeed think this would be useful addition to the manuscript. Perhaps consider adding it to the distributions you prepared in response to a comment from Reviewer B, too?

This information is indeed valuable for readers, so we followed your suggestion and included it in supplements A6 and A14 that report visual scale inspection.

Regarding the two separate regression models, I am convinced by the authors line of argumentation for leaving the analyses as they are. Thank you for clarifying.

Thank you again for pointing us at the need to clarify certain decisions regarding our analyses. We believe that this clarification may inspire future work to carefully consider the variables used in analyses, particularly in the domain of activist burnout research.

All the best

Recommendation: Accept Submission

Thank you again for your constructive and thoughtful review of our manuscript, which has greatly improved its transparency and value to the field.

Comments by Reviewer B

Authors' Response to the Reviewers Round 2

Overall evaluation

The authors have done an excellent job addressing my earlier concerns, and I believe the paper makes a clear and interesting contribution to the literature. I particularly commend the thorough additional analyses and the careful implementation of much of the reviewers' feedback in the revision. The expanded supplementary materials, which now include more detailed information on the sampling procedure, items, and analyses, substantially improve the manuscript. I now only have a few additional minor comments that I believe should be addressed prior to publication.

Thank you very much for acknowledging our efforts and your help in making our research procedure transparent.

Impact statement/Conclusion

I recommend softening the wording of the last sentence of the Impact statement/Conclusion. The current phrasing "Only in such..." appears too strong. You might consider something along the lines of: "Such need-centered environments may aid in fostering resilience..."

We agree that this framing was too strong and now adapted it based on your suggestion.

Such need-centered environments may help individuals to become resilient agents for socio-ecological transformation.

Study 1

Page 7: The sentence "Study 1 focuses on individual's main environmental initiative." seems to clash with the later reference to "participation in a larger number of environmental initiatives." I suggest rephrasing the first sentence to clarify how "main" versus "multiple" initiatives are conceptualized and measured.

Thank you for pointing out this inconsistency. Indeed, Study 1 did not exclusively focus on the main initiative, yet certain measures (e.g., volunteer hours, collective efficacy) referred to the main initiative. Therefore, we deleted the sentence you criticised and instead added an explanation following the hypotheses.

We hypothesize the following structural aspects to be associated with activist burnout: weekly volunteering hours (H1a), being paid for one's involvement (H1b), and participation in a larger number of environmental initiatives (H1c). Regarding psychological aspects, we expect that self-efficacy (H2a) and collective efficacy (H2b) are negatively related to activist burnout, while participative efficacy is positively

related to it (H2c). Therein, volunteering hours, being paid, collective and participative efficacy pertained to individual's main environmental initiative. We explore social identification with the main initiative and environmental self-identity as additional explanatory variables.

Results

Page 7: I recommend mentioning the PANAS in the study description, as its appearance in the measures section came somewhat as a surprise.

Page 9: This may be resolved once the above change is implemented, but at present it is unclear why the PANAS was included. Is it primarily intended as a sanity check (e.g., to verify that burnout is related to affect), or is it also used to investigate well-being beyond burnout? A brief clarification of its role would be helpful.

Good point – with the PANAS, we aimed to test whether the associations of explanatory variables with burnout would replicate when using affective measures instead – especially those that were not specific to volunteering. We added a sentence to our Study 1 description, so that readers learn about their exploration before measures are described, and slightly adjusted the description of our exploratory results.

Study 1 description

Moreover, we examined positive and negative affect as complementary indicators of wellbeing to assess whether the associations with burnout would replicate when using affective measures not specific to volunteering.

Results

Second, we explored positive and negative affect as complementary indicators of wellbeing that were not specific to volunteering (see Supplement A9). Reflecting burnout findings, personal self-efficacy was positively related to positive affect ($\beta = 0.24, p = .003$), and social identification showed negative associations with negative affect ($\beta = -0.14, p = .029$).

Study 2

Page 11: “replicate and extend these findings by examining two additional constructs...”

Great suggestion, which we directly included.

Study 2 sought to replicate and extend these findings by examining two additional concepts discussed in qualitative studies on activist burnout (Chen & Gorski, 2015; Gorski et al., 2019): descriptive norms and integrated motivation.

Page 11 Descriptive norms: I am unsure how well the description of the importance of descriptive norms aligns with the actual items used. You state that “perceiving high involvement levels among peers...” may be the key factor driving excessive involvement. However, the items seem more neutral (e.g., “My friends actively engage in the socio-ecological

movemen.”), and may not fully capture perceptions of high involvement. Could this mismatch help explain why descriptive norms were not related to the outcome?

Thank you for noting this discrepancy. We revisited the qualitative interviews that prompted us to assess descriptive norms and found that they emphasized friends and active movement members as part of one’s social network, rather than the degree of their engagement. However, in our view, it is very plausible that only such extensive engagement in close others predicts burnout, an assumption that impacted our previous description. Therefore, we changed the Study 2 description to more closely match the cited studies and added two sentences on this issue to the discussion to inspire future research.

Study 2 description

However, interview studies indicate that involvement among peers can exert pressure on engaged individuals to increase their own involvement beyond their physical and emotional limits. As one interviewee put it: “if your friend is like, ‘hey... do you want to do extra leafletting or something with me?’ then it doesn’t just feel like you’re saying no to the cause, you’re also saying no to one of your friends” (Gorski et al., 2019, p. 372). Thus, being embedded in active social movement networks may increase the risk of burnout (Chen & Gorski, 2015; Gorski et al., 2019), particularly when these group members are also regarded as friends.

Discussion

Not in line with expectations, descriptive norms of friends and the movement did not explain activist burnout in our main analyses, though movement norms explained burnout in robustness checks of Study 2. In general, these results call into question Gorski and colleagues (2019) suggestion that friendships within the movement are a driver of activist burnout. Notably, our measure of descriptive norms captured only whether friends were actively involved, without assessing the extent of this involvement. It is possible that only particularly high levels of involvement among close others are associated with activist burnout.

Page 12: “Finally we explore... as additional explanatory variables.” I am missing a sentence here explaining why these variables are included. Have they been shown to be of importance considering movement engagement, for instance?

Thank you for pointing out the lack of explanation regarding our exploratory variables. We now added references and our reason, which is similar to what you already expected. However, we tried not to go into detail too much as these are only exploratory analyses for readers particularly interested either in these concepts or in conducting their own research on activist burnout.

Finally, we explore additional explanatory variables that have been associated with engagement in collective action in previous research (e.g., Bamberg et al., 2018; Wallis & Loy, 2021; Wullenkord, 2023; the Authors, 2025): affective injustice, moral convictions, injunctive norms, descriptive norms of the family, other forms of volunteer motivation, and psychological need satisfaction/ frustration as additional explanatory variables.

Methods

Page 13: “We recruited ... engaged in socio-ecological transformation”. I believe the word movement is missing here.

This is correct, thank you for spotting this missing information. We updated the sentence accordingly.

We recruited individuals who self-described as actively engaged in the movement for a socio-ecological transformation.

Page 13: “met the study’s definition of a person actively engaged” I suggest adding the definition, perhaps in a footnote, to make the inclusion criteria more transparent.

Thank you for this comment. As you suggested, we added the description from the Supplements as a footnote to the main article.

Participants read the following statement and indicated whether it applied to them: „Active engagement in the movement for a socio-ecological transformation can include many things in our understanding: It can be engagement in local or global environmental groups, NGOs, or political parties, as well as volunteer work in a nature protection project or the participation or organization of demonstrations, occupations, or educational events which deal with socio-ecological issues. It can also include active engagement which deals with the social impacts of environmental crises like climate-induced migration or environmental racism. If paid work feels like such a kind of active engagement, it also counts as ‘active engagement for a socio-ecological transformation’. In this understanding, passive membership in a group would not qualify as a part of active engagement.“

General discussion

Line 700 (Page 2): “Yet, demands in the workplace do not seem to be related to the activist sphere.” I am missing a word here – do you mean to demands in the activist sphere? Or burnout in the activist sphere?

You’re right, this is something we should clarify. We now added two words to explicate the intended meaning.

Yet, demands in the workplace do not seem to be related to exhaustion in the activist sphere.

Line 737: It should be “no longer explained burnout when” (no comma)

We fixed this error.

Line 758: “Other than expected” could be rephrased for clarity. For example: “Not in line with expectations, ...”

We clarified this statement according to your suggestion.

Not in line with expectations, descriptive norms of friends and the movement did not explain activist burnout in our main analyses, though movement norms explained burnout in robustness checks of Study 2.

I really appreciate the extended limitations and future directions section!

Thank you – we also believe that the extended section helps critically situate our study in the debate about burnout and offers ideas for improvement to researchers interested in conducting their own studies on this topic.

Data preparation and analysis:

It is really interesting that differences between those respondents who are paid and those who are not differs between studies. I would encourage you to include the exploratory analyses of these group differences in the supplementary materials, as I believe this will be of interest to many readers.

This is indeed relevant information for our readers, so we followed your suggestion and included it in the supplements. Based on a comment by Reviewer 1, the information can now be found under the visual scale inspection heading (A6 and A14).

Other points:

The authors use “/” in different ways, sometimes followed with a space and at times with no space. Please standardize this usage throughout.

Thank you for your careful feedback. We now use a consistent form without space throughout the text, for example,

„[...] and three items captured negative affect (“At the moment, I feel scared/angry/guilty”, $\alpha = .71$).“

Page 4: “further served to validate of our” should be “further served to validate our”

We fixed this error.