Editor Decision Letter

Thank you for submitting your manuscript to JCR. The paper was read by three reviewers, an associate editor and me.

This is a nice paper, and I read the reviews asking myself whether the reviewers weren’t being just a little too demanding. But in the end I concluded that I could not disagree with the reviewers who thought it didn’t quite make it as a conceptual contribution, and with the reviewer who was not convinced that it had captured its phenomenon. It was a number of relatively minor points that in the aggregate worked against my pushing back against the readers in one of those two directions.

Let’s start with the conceptual contribution. The theoretical charge against the paper is that it is a concatenation of known results. I don’t find that to be fatal. From moderate ambient noise to disfluency to abstract construal to creativity all in one paper seems enough. It’s the studies themselves that undermine the conceptual contribution. In study 1 you’d have to convince us how respondents can get through 8 RAT items in less than two seconds each. In study 2 we just don’t buy that the more ambiguous ad is more creative, not without some evidence that the manipulation worked. There is B’s point that the noise to construal level relation is tested only once. As an aside I am not unduly concerned about the floor on your measure of arousal if the posited chain of effects is obtained. In sum, the studies don’t make a tight package.

The other direction would be to throw out the weaker studies and take the paper as a demonstration of a novel consumption phenomenon. But here reviewer C has some telling points, particularly the suggestion that consumers might deal with noise in the field by disengaging from the task, or that even if noise unwittingly aided creativity it might come back to hurt satisfaction or commitment. If there had been a really solid field study, it might have tilted the scales.

With this background, my decision is aligned with the associate editors’ which is to invite a risky revision. There are risks because new field work, is going to be needed and we can’t be sure how it will come out. However on the positive side you have an engaging topic and a lucid writing style (it is very rare to have a reviewer say, as A does, that a paper is a joy to read.) I am optimistic that the project can be brought to fruition. There are some great ideas in the AE report, though I don’t think I would require that much newness if you can just do more cleanly what you set out to do.
If you revise I will ask the present team to stay with the paper and I certainly hope they will because the reviews were extremely thorough. Please provide concise revision notes that address the issues in the decision letter and AE report.

Please let me know if any issues in this letter or the reports need clarification.

**AE Report**

**Comments to the Authors:**

This is a very well-written paper on an important topic. The link between noise and consumer creativity is an intriguing one and offers the potential for a rich theoretical contribution (as well as applied learning). The authors use a construal-based perspective to offer predictions about the nature of this link and obtain good support for their hypotheses over a series of studies.

While acknowledging these strengths, all three reviewers bring up concerns as to the level of conceptual learning currently offered by this research. Rev A notes that past work has already found evidence for the key theoretical links in the authors’ conceptualization (moderate noise can increase creativity; noise influences construal levels; construal influences creativity). Both Reviewers A and B question how the current findings build upon past work in the noise-creativity literature, especially from the viewpoint of resolving existing discrepancies. These reviewers also raise relevant concerns about the role of arousal, and both question whether the measure used in Expt 1 was sufficiently sensitive. Reviewer C, also in the spirit of seeking to enhance the theoretical contribution made by this research, offers several suggestions as to the boundary conditions the authors might wish to study in order to obtain a more precise understanding of the relationship between noise and creativity (more on this below).

My own overall assessment is that the topic is very interesting and the authors are off to a promising start, but that the current treatment is too narrow a view of what could be an extremely rich area. As Reviewer A points out, the key insights underpinning the theorizing have already been supported; although a mitigating point is that this research is the first to demonstrate the noise-construal link, the overall addition to knowledge is somewhat lacking in depth. Related to the concern about conceptual learning is the failure to resolve past findings. The paper opens promisingly with a description of past work, which appears to have found discrepant insights on the relationship between noise and creativity. Given this positioning, the reader expects that the author’s conceptualization will help to resolve existing tensions. However, this is not attempted, leaving the reader wondering as to how exactly the current work builds on and adds to the past work in this area.

Going forward, the authors might want to a) better incorporate past work in the area (and use their conceptualization to reconcile discrepant findings); b) in doing so, provide a more nuanced and complete picture of how noise influences creativity. The current picture struck all readers as being a bit too simplified. A few suggestions in this regard:
a. It might be worthwhile to use an enhanced version of the current conceptualization to address past findings which have demonstrated an inverted-U relationship between noise creativity. Such a pattern is sometimes the manifestation of an underlying 2-factor structure, and this offers one possible path to pursue. Specifically, it seems plausible that the distraction induced by noise has two opposing effects on creativity: i) it creates disfluency, thereby inducing an abstract level of construal (positive impact on creativity); ii) it reduces the actual extent of processing – and when this reduction is substantial enough, this leads to a negative impact on creativity. Regarding the latter effect: figuring out a common theme given apparently unrelated ideas (Expt 2) or reacting favorably to more elaborate information (Expt 4) is likely to require sufficient processing resources – thus, when such resources fall below a threshold, creativity should be impaired. This 2-factor structure would thus predict that at moderate levels of noise, the positive influence dominates, while at high levels, it is the negative influence that prevails. Providing evidence for such a pattern would not only lead to a much richer conceptualization of how noise influences creativity, but it would also help to explain past findings (while retaining the authors’ new insights regarding the role of construal). Of course, pursuing this path would require serious additional work, since the authors would need to examine low, medium and high levels of noise, and also investigate effects of two simultaneous drivers: disfluency and actual processing (the two are not quite the same, since disfluency is a subjective perception).

b. Another path would involve revisiting the role of arousal (as indicated by both Reviewers A and B). I agree with these commentators that the arousal scale used in Expt 2 might not have been sufficiently sensitive (both in its wording and in the fact that it was administered at the end of a set of dv’s), and also that an arousal lens offers a potentially parsimonious account of the effects. Mandler’s work has shown that individuals that a moderate level of stimulation is optimal for most individuals; it is a plausible stretch to argue that a moderate level of stimulation (arousal) also induces the most creativity. This argument would explain why creativity is higher at moderate vs. high/low levels of noise.

To address this issue, the authors could rule it out by utilizing more sensitive measures of arousal (see Rev B; it would also be more convincing to have the arousal measure right after the manipulation); alternately, they could choose to rework their conceptualization with arousal as the key driver (this would be a whole lot less interesting though).

c. Reviewer C suggests several boundary conditions that would be interesting to study. Of these, the first one (consumers’ motivation to stay task-focused) is related to point a) above – at very high levels of noise, the extent of distraction would make it difficult to stay task-focused. Of the other suggestions made by this reviewer, I found the third particularly intriguing: namely, examining how the valence of noise, in addition to its decibel level, influences creativity. If the authors’ conceptualization is only based on the notion of distraction (which it appears to be), this would argue that even a pleasant sound, because it is distracting, should influence creativity in the same manner as the types of noise studied currently. However, if there are other aspects of noise that influence creativity (and see Rev A’s question as to whether the effects are driven by the nature of distraction, rather than its extent), valence might play a key role. Indeed, it might be possible to tie this issue in with point b) – a pleasant sound, while it may be distracting, might not produce as much arousal. Therefore, if the current effects are driven by distraction (arousal),
one would expect a similar (different) pattern of results if a pleasant sound is studied. Again, studying this issue could significantly enhance the conceptual richness of the work (Note: the authors could argue, of course, that “noise”, by definition, represents an unpleasant sound. If taking this approach, they would have to rely on enriching their conceptualization along other directions, but the valence issue could then be a subject of speculation in the GD).

To be clear, following up rigorously on any of the three options above (or indeed, any other route that the authors can think of to enrich their work) should provide the platform for a sufficient contribution; the authors don’t have to do it all. Whichever option they pursue, however, should do a better job of addressing past work while also providing a more rounded picture of the noise-creativity relationship.

Specific issues:

a. In future data collection, the authors should measure individual differences in creativity to better position against past work (Toplyn and Maguire 1991; see both Revs A and B).

b. Like Rev A, I was troubled by the measure of creativity used in Expt 2 (ad liking). I am not clear that liking for the more “ambiguous” ad reflects greater creativity. It could reflect greater processing; alternately, it could simply reflect differences in construal level (more abstract ad preferred under high-level construals) rather than in creativity. I suggest that the authors either drop this study (especially since Expt 1 makes the same point) or, if keeping it, include a post-study which shows that a standard manipulation of creativity has the same effect on ad liking.

c. Rev B makes the point that even though the key theoretical contribution of this work (at least in the current version) has to do with establishing the link between noise and construal level, only one of the four studies actually tests this link (Expt 3). If the burden of theoretical contribution continues to rest on this link, the authors might wish to bolster the evidence for it: in particular, a post-test that simply examines the impact of noise on construal levels (with no intervening measures) would be desirable.

d. Lastly, Reviewers A and B ask for clarification on several procedural and data reporting issues; these should be easy to provide.

Clearly, successfully revising this paper will require substantial effort on both conceptual and empirical fronts. I do wish the authors every success though – because again, I believe this area has significant potential. Finally, there are some things I believe they do NOT need to do:

a. Rev B expresses concern about the characterization of 70 DB as a moderate amount of noise; I am not too troubled by this, however – as long as the authors can point to a logical reason for this choice of sound level.

b. While I can see that having a control group in subsequent studies (after Expt 1) would be useful, I buy the authors’ rationale for only including it in that first study.
c. Similarly, although Experiment 4 could ideally have included other measures, this is difficult to do with a field study; and the authors are to be praised for having undertaken such a study. I am also not overly troubled by the lack of actual choice in this study.

d. As Rev C notes, the authors do not have to empirically address each one of his/her suggestions regarding boundary conditions. In that vein, I have identified the two that I believe might be the most promising in my comments above. The other issues mentioned by this reviewer could fruitfully be discussed in the GD, which is currently quite short.

Good luck!

Reviewer A

Comments to the Authors:

This paper was a joy to read. It is clear and well-written. The literature review is appropriate and the hypotheses are clear. I also thought the studies are clever and provoking. However, I’m not sure whether this paper makes a substantial novel, theoretical contribution to merit publication in JCR. As discussed in more detail below, it is difficult to say whether the current studies significantly advance the literature much beyond its current state. Furthermore, I had concerns with specific aspects of each study.

Novel Theoretical Contribution

As noted by the author(s), previous research has established the following effects:

(1) Moderate levels of noise compared to low or high levels produce more creativity (Toplyn and Maguire 1991)

(2) Creativity is related to construal level (Foerster et al. 2004)

(3) Construal level is related to processing disfluency (Alter and Oppenheimer 2008)

Consistent with this previous research, the current paper shows that a moderate level of noise leads to more creativity because it influences construal level and processing disfluency. In other words, the current research brings together the already-established elements noted above. Although this is a contribution of sorts, I’m not sure it’s a large-enough novel theoretical contribution to merit publication in a high-bar outlet such as JCR.

It is possible that the author(s) might argue that Toplyn and Maguire (1991) showed the moderate-noise effect only for high-creativity individuals. The critical problem, however, is that the current research did not measure or did not report individual differences in creative ability. Indeed, the rather small effects found in the current research are highly consistent with the possibility that the current findings are being driven by high-creativity individuals.
Theoretical Argument

The researcher(s) make the following underlying argument for their effect:

“We reason that a moderate (vs. low) level of ambient noise distracts people, causing processing difficulty or disfluency” (p. 6).

This argument implies that distraction will produce more creativity. My sense is that this argument is untenable. Some types of distractions will lead to more creativity and other types of distractions will lead to less creativity. The crucial part is likely to be the nature of the distraction, not the distraction in general. I advise the authors to revise their argument.

Previous Literature

As the author(s) note, there has been a lot of research examining the effects of noise on various kinds of performance, including creativity. Several decades of research paints a mixed picture. I was hoping that the current paper would help resolve this mixed picture. But unfortunately, it does not resolve much. Instead, my sense is that the current paper is chasing a specific effect with a specific mediator. While the paper documents this effect, this effect does little to resolve the many discrepancies in the noise and performance literature.

Study 1

The author(s) report that it took an average of about 14 seconds to complete the RAT task. Given that there were 8 RAT items, 14 seconds is extraordinarily fast for the whole task. If the 14 seconds time is true, this raises suspicion about what exactly is going on and about the difficulty level of the hand-selected RAT items.

The noise and performance literature often finds that arousal is related to outcomes. In the current research, the author(s) measured arousal in only one study (Study 1), using self-report measures—and a self-report measure that is not particularly sensitive. The study essentially found a floor effect of arousal, where arousal was at 2.4 on a 1-7 scale. The authors used this finding to dismiss the role of arousal in their effect. However, I do not consider this a serious attempt to measure arousal, and I would not dismiss arousal as a potential mediator of the noise/creativity effect based on this single study.

Study 2

This study has a problem with the face validity of the stimuli. The study depends on one advertisement being ambiguous and the other one being unambiguous. The “ambiguous” ad has a camera and a bunch of scenic photos that could be taken with the camera. The “unambiguous” ad has a camera and images of accessories for that camera. I don’t see much good reason why thinking creatively would lead a person to like one ad but dislike the other ad. I also don’t understand how one of these ads is supposed to be more creative, as argued by the author(s). Furthermore, I don’t understand why the supposedly “unambiguous” and less creative ad is liked more in the low noise condition.
Study 3

Study 3 had 42 participants. About half of these were in the low noise condition and about half were in the moderate noise condition. Measuring creativity on a 7-point scale, there was a 0.21 difference (3.87 vs. 3.66) between the two conditions. This small effect supposedly reached significance. If this is indeed significant, the study must have had a tiny standard deviation to get this effect to be significant with this sample size. This seems strange.

Study 4

This study provides no descriptive statistics in the results. The reader is given a Beta and told that it’s significant. This reporting approach leaves much to be desired.

Reviewer B

Comments to the Authors:

This is clever and creative research and the various studies fit well together. When receiving this paper to review the first thing I did was to try to obtain at least some understanding of the literature in this area. What I read led to my first concern. What you find is very different from what others have found. Your participants are the general population of students. For that population or people in general, it seems like the general finding in the literature is that noise, if anything, impairs creative thinking rather than enhances it, e.g., please see the Kasof (1997) and Toplyn and Maguire (1991) articles you referenced. As you note, it is only for a subset of highly creative individuals that moderate (but not low or high) levels of noise have been found to improve creative performance. Why do you think you have such different findings?

Another question I have relates to 70 decibels (dB) being considered as a moderate level of noise. At least from the sites I looked at, maybe 70 dBs is not a very high level of noise, but it does seem to be a relatively high since it is like the noise in a noisy restaurant/street noise/normal conversation or a vacuum cleaner about a yard away, and so on.

See link below for one source I got from the web.


To make readers (at least me) feel more comfortable, if others have found similar positive effects of such a high level of noise as 70 dBs on creative performance, I’d be interested in seeing you incorporate that research.

You find that arousal is not affected by noise level, yet my cursory reading of the literature would suggest that it is (see for example the research Hockney discusses in the Hockney (1970b) article you cite). Also, I am surprised how low the arousal scores were in Experiment 1 even at 70 dBs. I would have thought that arousal would be affected by noise level.
especially 70 dBs of noise, and especially considering that you had a constantly varying background noise. I am wondering whether the scales you had to measure arousal were just not sensitive enough to pick up effects of noise on arousal. One thought is to incorporate in future research an arousal scale ranging from “not aroused at all” to “very aroused,” and perhaps scales assessing stress/anxiety as well. These might be more sensitive scales than the “relaxed” and positive arousal scales you had in your research. In any event, given its possible importance, how come arousal level was only assessed in Experiment 1? I have the same question regarding involvement and mood valence too.

The experiment where you tested the process is the critical one. It provides support for noise level $\rightarrow$ processing disfluency $\rightarrow$ construal level $\rightarrow$ creative choice. The more I think about the process you are suggesting the more interesting I think it is but this paper does need more than one experiment that directly looks at the process since even you regard the theoretical contribution as the most important contribution of your research (see what you say in the introduction and the General Discussion regarding the major contribution of your research). One thought is that you collect open-ended responses in the next study to get more insight into both processing disfluency and construal thinking at different noise levels when participants are doing the assigned task. You could also construct questions to tap high vs. low level construal thinking during performance of the task. At high levels of construal thinking, objects are more likely to be assessed: 1) in terms of superordinate goals rather than more concrete considerations, 2) desirability aspects rather than more specific aspects, and 3) potential advantages rather than disadvantages (see for example the work by Trope and his colleagues like Liberman, Trope and Stephan 2007 “Psychological Distance” in the Social Psychology handbook edited by Kruglanski and Higgins; Eyab, Liberman, Trope and Walther, JPSP, 2004; see also Liu JCR, (2008). These are good sources for possible dependent measures. Again, it would help if you had more process evidence.

I think it was premature to drop the control group after only one study, particularly considering that in contrast with the rest of the experiments, the first experiment was not done in a consumer context.

Unless I missed it you didn’t report the means in each condition for the processing disfluency and construal thinking measures in Experiment 3. I am particularly interested in how distracted participants were in the 70 dB condition.

Regarding Experiment 4, you mentioned that at times the lounge was quite noisy but the highest level of noise seemed to be only moderate (71.50 dB), at least according to your definition of what is moderate noise. It would have been interesting if you had times when the noise was low, medium, and high since according to your theoretical perspective you would expect an inverted U relationship between noise and creative output. Still Experiment 4 was very creative although it would have been good had you had more than one dependent measure (likelihood of purchase) in that last experiment.

I have some questions regarding how you analyzed the data in Experiment 3. First of all, how did you get from the 188 ideas that were generated to the 61 ideas that were considered unique? If it was you the author(s) who narrowed them down please indicate how you did it.
Second, please clarify how you came up with the originality and appropriateness indices. I can’t really follow the rationale for what you did.

Small thing- the Smith (1995) and Smith, Ward and Schumacher (1993) are missing.

Reviewer C

Comments to the Authors:

The basic premise of this paper is that moderate (vs. low) noise levels increase the level of processing disfluency, inducing consumers to adopt more abstract construals, which in turn leads to higher creative cognition. The paper is well written, and the 4 reported studies tell a coherent story. My comments focus mainly on some potential boundary conditions that may be worth addressing it in more detail in the manuscript. To be clear, I don’t think is imperative that the authors test all these possible moderators empirically, but at the very least they should discuss some of these possibilities as directions for future research.

- Consumers’ motivation/need to stay on task: across all studies, participants were given specific tasks, which they had to complete it. If disfluency can decrease motivation to process information, as shown by previous research, it is possible that in more naturalistic settings, when consumers have the option to easily disengage, the effect of background noise on creative cognition is significantly attenuated (to the extent that the task becomes demotivating). My initial expectation from reading the front end of the paper was that this was going to be addressed by the field experiment (study 4), but I was somewhat disappointed that study 4 although positioned as a field experiment also uses a hypothetical task, in which consumers have to rate different products. Thus, it remains unclear whether the effect influences real choices.

- Different types of creative cognition: Although I’m not an expert on the topic of creative cognition, I believe previous research has examined different forms of creativity (e.g., problem solving, artistic, social, etc). The importance of divergent and abstract thinking to these different forms is likely to vary. The 4 studies seem to focus more on creative problem solving. It would be helpful to the reader if the authors more clearly discussed how different types of creative cognition may be more or less influenced by background noise.

- Different types of background noise: Noises of equal sound levels may be more or less detrimental to processing fluency. For instance, marketers using music to increase background noise may not create the disfluency effect necessary to increase abstract thinking. Is the pleasantness of background noise a predictor of disfluency? From a practical viewpoint, discussing the extent to which different background sounds can create disfluency would increase the contribution of the paper.

Other conceptual (interesting) issues:

- Perceived effort: do participants in the moderate noise condition perceive the task as more effortful? In study 3, the authors report that noise level did not affect the number of solutions...
generated, so I infer that the noise level manipulation did not have a significant effect on the amount of participants’ elaboration, but did background noise affect the subjective experience of processing? If yes, this could have interesting downstream effects, such as higher commitment with choice, satisfaction etc.

- **Perceived creativity:** similarly, I wonder whether self-reports of creativity would vary with the noise manipulations. The studies suggest that people are “objectively” more creative in the presence of moderate noise, but do they perceive themselves as such? If yes, this could suggest a mechanism by which background noise could potentially increase motivation, confidence, and task satisfaction.

I enjoyed reading your research!