

A Factor Structure within Misophonia:  
The *Sussex Misophonia Scale* for researchers and clinicians

L.J. Rinaldi, J. Ward & J. Simner

University of Sussex

Author Note

Authors received funding from the REAM foundation, Misophonia Research Fund initiative awarded to authors JS and JW. We are grateful to Dr James Alvarez for his programming assistance, and to Sophia Koursarou for her help with data collection.

## Abstract

Misophonia is an unusually strong aversion to a specific class of sounds -- most often human bodily sounds such as chewing, crunching, or breathing. A number of questionnaires exist to diagnose misophonia, but few have been validated, and fewer still show any factor structure within the symptoms of the condition. Here we present a novel tool, the *Sussex Misophonia Scale*, which represents all key theme from previous questionnaires within a single easy-to-use measure. We validated our questionnaire in a sample of 501 adults, including people with and without misophonia. Our exploratory factor analyses revealed four factors tied to misophonia (*Feelings/ Isolation; Life consequences; Intersocial reactivity; Avoidance/ Repulsion*) and a fifth factor of *Pain*, suggesting a co-morbidity with the related condition of hyperacusis. Receiver Operator Characteristic showed our questionnaire to be an excellent measure for identifying people with misophonia, and we present it here with its diagnostic threshold for researchers and clinicians.

*Keywords:* Misophonia, Sound-sensitivity, Sensory sensitivity, aversion

## **A Factor Structure within Misophonia:**

### ***The Sussex Misophonia Scale* for researchers and clinicians**

Misophonia is a sound sensitivity condition in which certain classes of sounds feel unusually unpleasant. People with misophonia react to these common everyday sounds with extreme negative emotions such as anger, disgust, or anxiety. Typical triggers are not particularly loud, but include sounds such as chewing, crunching, breathing and tapping – all easily ignored by others, but highly aversive to misophonics. Because misophonia was named and recognized relatively recently (Jastreboff & Jastreboff, 2001), our understanding of misophonia is somewhat nascent, and so too is the science of its prevalence and diagnosis. Early studies suggest as many as 19% of the population report some degree of misophonia which can impact on daily life (Wu et al., 2014; Zhou et al., 2017). And rates may be yet higher in groups with elevated anxiety (49% in medical students: 37% mild, 12% moderate, 0.3% severe; (Naylor et al., 2020). However, it is difficult to draw a line between everyday disliking, and the type of disliking found in misophonia. Most people can find misophonia triggers somewhat unpleasant (e.g., messy slurping), but only misophonics will feel the extreme rage and disgust that makes tolerating these sounds almost impossible. Our challenge as researchers and clinicians is to understand where to draw the line between pathology and everyday experience. This should be done by eliciting the reports of many people with misophonia, and designing questionnaires with appropriate and validated diagnostic thresholds. This is one aim of the current paper, where we test our novel measure (the *Sussex Misophonia Scale*) for its ability to distinguish misophonics from controls. A second aim is to understand whether misophonia has a factor structure. This would be important for future therapies, since any sub-components could be addressed individually with targeted therapeutic interventions.

Existing questionnaires (see Table 1) have largely been constructed with a view to recognising misophonia at audiology or psychology clinics, where misophonia patients often appear. Within these settings, the primary aim is to recognise a condition efficiently and confidently, although few measures have published validations. A second problem is that misophonia questionnaires have not always successfully factored-out allied conditions such as hyperacusis (i.e., pain or discomfort, especially from loud sounds). Finally, no questionnaire has demonstrated a factor structure within the behaviours, feelings, and outcomes of those who experience misophonia (but simply a division between triggers on the one hand, and a single factor of behaviours/feelings/outcomes on the other hand; Wu et al., 2014). Here we address the existing literature in two ways: first, we devise and validate one of the most comprehensive misophonia measures to date, and we present this to two large cohorts, with and without self-reported misophonia. Second, we use this approach not only to understand which questions are most relevant for capturing the experiences of misophonia, but also whether misophonia has a factor structure.

In approaching our research we began with a comprehensive review of all existing misophonia measures at the time of study. We briefly review these here, noting in particular where measures have been validated. Table 1 summarises their format, their length (in items), and whether they had been investigated for a factor structure. We examined all items across all questionnaires and this oversight allowed us detect four prominent themes emerging about misophonia's phenomenology. These themes appear to relate to (a) the number and nature of the trigger sounds (e.g., chewing, swallowing) (b) the emotions felt in response to triggers (e.g., anger, disgust) (c) the behaviours typically engaged in (or thought about) when hearing aversive sounds, including both reactive behaviours (e.g., hitting the person making the sound) and avoidant behaviours (e.g., leaving the room), and (d) the consequences in other areas of life such as knock-on effects in relationships or work (e.g., work avoidance). Importantly, we

found that themes tended to be represented only sporadically across measures, rather than exhaustively within any single questionnaire. Below we therefore present a validation on our own novel scale, which incorporates all these themes, which we hypothesise may emerge as separate factors within a factor analysis.

Table 1.

*Summary of existing misophonia questionnaires, published and unpublished.*

Questionnaire	Source	Validation?	Items	Factor structure?
Misophonia Assessment Questionnaire (MAQ)	(Dozier, 2015; Johnson, 2014)	--	21	--
Misophonia Impact Survey	(Dozier, 2016)	--	5	--
Misophonia Activation Scale (MAS)	(Fitzmaurice, 2010)	--	10	--
Misophonia Physiological Response Scale (MPRS)	(Bauman & Dozier, 2013)	--	12	--
Misophonia Trigger Severity Scale	Bauman, N. in (Dozier, 2015)	--	12	--
Misophonia Coping Responses	(Dozier, 2013a)	--	21	--
Misophonia Emotional Response	(Dozier, 2013b, 2015)	--	30	--
Unnamed misophonia questionnaire	Eric Vernon-Cole, unpublished	--	21	--
Selective Sound Sensitivity Syndrome Scale (S-Five)	(Vitoratou et al., 2018)	In progress	85	In progress
The Misophonia Questionnaire (MQ)	(Wu et al., 2014)	Yes	20	Yes (2 factors)
Amsterdam Misophonia Scale (A-MISO-S)	(Naylor et al., 2020; Schröder et al., 2013)	Yes	8	Yes (1 factor)

Items columns describes the number of items relating to misophonia (i.e., excluding demographic or non-misophonia items). The two factors of the MQ relate to the triggers of misophonia on the one hand, and a second factor of all behaviours/feelings/outcomes combined.

We also included one final requirement when devising our measure, which is that the wording of our questionnaire should be understandable not only to adults, but to younger adolescents.

A measure for adolescents would be invaluable for early diagnosis and treatment -- not only because misophonia often appears to begin during childhood or adolescence (Rouw & Erfanian,

2018), but because it can worsen with age, or give rise to coping strategies that could theoretically worsen sensitivity over time (e.g., wearing headphones; Palumbo et al., 2018). Our review found that child assessments were extremely rare, and those that existed were typically ‘add-ons’ to adult diagnostics (with instructions to substitute “my sound issues” for “my child’s sound issues”). This sometimes creates ambiguous items (e.g., *My [-> my child’s] sound issues currently make me unhappy*; Who is unhappy: parent/child?) or even requires parents to comment on the internal mental states of their children, sometimes for subtle distinctions that might not be obvious to observers (e.g., *My child feels helpless? Or isolated? Or guilty?*). For this reason we created an adult questionnaire in such a way as to be ideally suited to adapting for adolescents from the outset (e.g., by using psycholinguistic norming data to ensure its language was appropriate for adolescents; see Methods). Finally, we devised our questionnaire to be time-efficient for shorter attention spans in younger participants. This also has the advantage of allowing researchers to apply our questionnaire to adults in time-sensitive research environments (e.g., testing large numbers, or placing it among other measures). To do this, we presented questions step-wise with conditional logic, such that only positive responses required further detail (see Methods).

In summary, we devised and tested a novel questionnaire with an aim to (a) create one of the most comprehensive misophonia measure to date, for researchers and clinicians (b) investigate the validity of our measure in a large sample of adults (c) investigate the factor structure of misophonia, and (d) devise a questionnaire that might be validated on adolescents in the future.

## **Methods**

### **Participants**

Misophonia participants were recruited via social media platforms where people with misophonia are known to gather (e.g., Facebook discussion groups), while controls were

Running Header: SUSSEX MISOPHONIA SCALE

recruited from the university student population in exchange for course credit. In total we tested 501 adults (mean age 25.27, SD 13.96), including 398 females (mean age 25.34, SD 14.29), 82 males (mean age 25.30, SD 13.24), 12 non-binary (mean age 26.50, SD 11.26) and 9 opted-out of reporting their demographics. Of these, 358 were recruited from the student population (295 females, mean age 21.58, SD 9.36; 53 males, mean age 19.70, SD 6.34; 5 non-binary, mean age 22.00 SD 2.55; 5 did not report demographics). The remaining 143 were self-declared misophonics recruited from online misophonia communities (103 females, mean age 36.19, SD 19.61; 29 males, mean age 35.55, SD 16.24; 7 non-binary, mean age 29.71 SD 14.12; and 4 did not report demographics). Ethical permission for all studies was granted by the local University Science and Technology Research Committee.

### **Materials and Procedure**

Participants completed our study remotely, using our in-house web application ([www.misophonia-hub.org](http://www.misophonia-hub.org)). This online platform is a one-stop resource containing all our tests and measures, alongside advice and support about misophonia for adults, children, parents, clinicians and educators. Our data was collected between January and April 2021. Participants were sent a URL via email to take part, and the study began with a request for demographic information on age, gender etc. Participants then began our testing, which included our two target questionnaires below (alongside other tests to be reported elsewhere). Both tests combined took 10-15 minutes to complete.

### **The Sussex Misophonia Scale**

In order to develop our questionnaire, we extracted items from all prior questionnaires identified by our literature review (shown in Table 1). We excluded repeated items, and those not suited to our 5-point Likert scale (e.g., free text questions). We then edited the wording for clarity, simplicity, and age-of-acquisition (Gilhooly & Logie, 1980), to ensure our adult

Running Header: SUSSEX MISOPHONIA SCALE

questionnaire would be suitable for creating a parallel adolescent measure in the future, with only minimal adaptation (e.g., it would require only a 1-word substitution in 4 items such as *I avoid work* → *I avoid school*). We additionally ensured our questionnaire was accessible by avoiding jargon (e.g., the word *triggers*).

Our final questionnaire for misophonia contained two sections. In Part 1, participants were shown a series of trigger sounds with the question: *We're going to ask you about things you see and hear every day. Have you always hated these things? Or don't you mind them?* There then followed eight broad categories (e.g., *I hate... the sound of people eating*; see Table 2). These eight categories encapsulated every type of trigger from all previous questionnaires (the only exception being that we avoided two sound that were clear triggers of hyperacusis: alarm, siren). Table 2 shows that seven out of eight trigger categories are for sounds, while one category was non-auditory; this is because people with misohponia can also be triggered by repetitive visual movements such as leg-swaying. Participants responded Yes/No for each category of trigger, and if all eight responses were No, participants proceeded to Part 2. However, if any category was responded to with a Yes, this revealed a full list of triggers within that category. For example, if participants responded Yes to *I hate the sound of people eating*, this revealed a further eight types of eating-sound (*crunchy foods (e.g. apples); crispy snacks; chewing; lip smacking; swallowing; slurping (a drink); wet mouth sounds (e.g., yoghurt); other eating sound*; see Table 2) along with the question *Which do you hate hearing? Tick all that apply*. Across our eight categories, we presented a total of 48 trigger items (shown in Table 2) although our conditional logic allowed us to ask this in a time-efficient way.

Table 2.

*Triggers for misophonia, and their superordinate category.*

No.	We're going to ask you about things you see and hear every day. Have you always hated these things? Or don't you mind them? I hate...	Which do you hate hearing ( <i>or seeing, for category 7</i> )? Tick all that apply.
-----	---	--



1	the sound of people eating	crunchy foods (e.g. apples); crispy snacks; chewing; lip smacking; swallowing; slurping (a drink); wet mouth sounds (e.g., yoghurt); other
2	the sound of repetitive tapping	pen clicking; foot tapping/ foot on floor; repetitive barking; tapping pen/ pencil; tapping finger; typing on a computer; other
3	the sound of rustling	rustling paper; rustling plastic; other
4	throat sounds	throat clearing; hiccups; humming; other
5	sounds people make through their mouth and nose	breathing; snorting (e.g., when people laugh); nose sniffing; coughing; snoring; whistling; sneezing; burping; other
6	some voice sounds	certain accents; some people's voices; certain letter sounds; certain vowels; certain consonants; other
7	repetitive visual movements	repetitive leg rocking; foot shuffling; people rocking back and forth on their chair; other
8	some background sounds (e.g., fridge humming)	clock ticking; car engines; refrigerator humming; dishwasher; washing machine/ dryer; fan; other

Categories are shown first, and sub-set items revealed in the event of a positive response.

At the end of this section, participants passed automatically to Part 2, which presented 53 statements (see Table 3). As noted above, statements were presented in a random order but loosely tended to fall into one of the following themes: emotional responses (e.g., *Sounds that other people don't mind can make me really angry*); (c) behaviours (carried out or imagined) when hearing aversive sounds, including both reactive behaviours (e.g., *I want to hurt people who make sounds I hate*) and avoidant behaviours (e.g., *I cover my ears to block out certain sounds*), and (d) the consequences (i.e., knock on secondary effects) in other areas of life such as in relationships or work (e.g., *My hatred of some sounds creates problems in work*). For each statement, participants chose their rating on a 5-point scale (Never, Hardly ever, Sometimes, Often, Always).

We also included items from a final theme, related to pain (e.g., *Sounds often cause me physical pain*), which we had also identified from previous questionnaires. Importantly, this is not part of the definition of misophonia, but rather the related condition of hyperacusis (Baguley, 2003;

Running Header: SUSSEX MISOPHONIA SCALE

Baguley & McFerran, 2011). Nonetheless, we included pain items for two reasons: (a) to reflect the fact that hyperacusis is co-morbid with misophonia (Jastreboff & Jastreboff, 2014), and (b) for its clinical usefulness, allowing clinicians diagnosing misophonia to also observe whether there is a possible need for hyperacusis screening (should participants score highly on pain items).

In total, Parts 1 and 2 of our questionnaire contained 109 items, with 48 items revealed only conditionally, so our questionnaire took just 5-10 minutes to complete.

### **The Misophonia Questionnaire (MQ)**

The MQ (Wu et al., 2014) is one of the few validated misophonia questionnaires for adults. It did not reveal a factors structure (other than to separate out triggers), although its validation makes it an ideal questionnaire against which to gauge our own measure. The MQ contains 21 questions across three sections. Sections 1 and 2 contain items on triggers (n8) and emotions/behaviours (n11) respectively; both are answered using a 5 point Likert Scale (0-Not at all true, to 4-Always true) and show good internal consistency ( $\alpha = .86$ ). Section 3 is a single item, 15-point severity scale, where participants self-diagnose their own severity by taking into account their number of triggers, degree of distress, and impairment in their lives (Wu et al., 2014). We adopted this MQ Severity Scale because the MQ was the most fully validated questionnaire at the time of our study, and individuals reporting  $\geq 7$  on its Severity Scale are considered by Wu et al. to have clinically significant misophonia.

## **Results**

*Approach to analysis.* Our approach was to explore the factor structure of our questionnaire, and then validate its items by considering its receiver operator characteristics (ROC). All analyses were performed using R Studio; we used *tidyverse* for general data wrangling, the package *psych* to perform exploratory factor analyses, and the *pROC* package to produce ROC plots.

### **Exploratory Factor Analysis**

We ran an exploratory factor analysis (EFA) to analyse the underlying factors within Part 2 (Likert-scale items) of our scale. Bartlett's test showed correlation adequacy  $X^2(1431) = 32288.85$   $p < .001$ , and Kaiser-Meyer-Olkin (KMO) showed sampling adequacy  $MSA = 0.98$ .

We ran a parallel analysis to determine the number of factors to extract. This analysis compares our data with simulated data to determine the number of factors appearing at greater than chance. Both this analysis, and a confirmatory reading of the scree plot, indicated 5-factors should be extracted. We therefore extracted 5-factors in our EFA using maximum likelihood estimation, and direct oblimin rotation - since we expected that factors would correlate. Following (Preacher & MacCallum, 2003), we wanted to ensure each of our items loaded onto at least one factor –and only one factor -- over .30. Our initial analyses of all 53 items showed 11 items did not meet these criteria. We excluded these items (8, 10, 14, 20, 21, 34, 39, 40, 45, 47, 52 see Table 3) from future analyses, and then repeated the process to remove a further two (1, 16). We next re-ran our EFA and the resulting model achieved simple structure, which is to say that each item loaded only onto 1 factor, greater than .30. These factor loadings are shown in Table 3. Our model had overall good-to-excellent fit on multiple measures: the root mean square of the residuals (RMSR) indicated “excellent” fit at 0.02, the comparative fit index was “excellent” (CFI, 0.94), the Tucker-Lewis Index was “excellent” (TLI, 0.92), and the RMSEA index indicated “acceptable” fit at 0.07.

In summary, our final questionnaire (see Appendix) contained 39 Likert-scale items (as well as the 48 trigger items in Part 1), with the following five factors. Factor 1 comprised 16 items relating to **Feelings and Isolation**, with items such as *Hatred of some sounds make me feel lonely*. Factor 2 comprised 6 items which describe **Life Consequences** (i.e., impact on work and friendships) including for example *I don't do well at work because of distractions from sounds*. Factor 3 comprised 5 items which relate to **Intersocial Reactivity** with items such as *I want to get pay back on people who make certain sounds*. Factor 4 comprised 8 items which deal with **Avoidance and Repulsion** with items such as *I cover my ears to block out certain sounds*. Finally, Factor 5 comprised our non-misophonia items which screen for **Pain** symptoms (suggestive of hyperacusis); it contained 4 items such as *I feel physical pain if unable to avoid a sound*. Internal reliability of all factors was very high with Cronbach's alpha estimates of .98, .94, .91, .92 and .95 for factors 1-5 respectively.

Table 3.  
*Five-factor Model Loadings.*

No.	Item	Feelings/ Isolation	Life consequences	Intersocial reactivity	Avoidance/ Repulsion	Pain (hyperacusis)
3	I have a problem because hearing certain sounds makes me unhappy	<b>0.53</b>	0.13	0.1	0.21	0.03
4	I feel no one really understands that I have a problem with sounds	<b>0.68</b>	0	0.08	0.2	0.05
5	I feel scared hearing sounds I don't like	<b>0.33</b>	0.14	0.03	0.03	0.26
6	Other people make fun of me for hating sounds	<b>0.5</b>	-0.11	0.19	0.19	0.12
13	I feel guilty because of my reaction to sounds	<b>0.73</b>	0.01	-0.13	0.2	0.11
15	I worry nobody can help with my sound problems	<b>0.91</b>	0.02	0.1	-0.05	0.01
23	I feel embarrassed about hating certain sounds	<b>0.94</b>	-0.02	-0.13	0.04	0.03
24	Nobody believes my problem with sounds	<b>0.62</b>	-0.05	0.24	0.07	0.1
25	Hatred of some sounds make me feel lonely	<b>0.69</b>	0.19	0.06	-0.1	0.11
30	I'm worried about always having problems from hearing certain sounds	<b>0.8</b>	0.18	0.05	-0.05	0.01

## Running Header: SUSSEX MISOPHONIA SCALE

31	I try not to let people know I hate certain sounds	<b>0.61</b>	-0.02	-0.03	0.23	0.02
33	My life is worse because of sound problems	<b>0.56</b>	0.26	0.12	-0.06	0.14
35	People think I'm crazy because of my reaction to sounds	<b>0.65</b>	0.01	0.22	0.05	0.06
38	Some sounds make me want to scream or cry	<b>0.47</b>	0.06	0.14	0.23	0.15
42	I suspect my friends think I'm weird, because of my reaction to sounds	<b>0.64</b>	0.14	0.12	-0.02	0.03
51	I think my problems with sounds are getting worse with age	<b>0.55</b>	0.16	0.17	0.05	0.04
17	I don't do well at work because of distractions from sounds	-0.03	<b>0.73</b>	0	0.19	0.05
18	I try to avoid going to people's houses if those people make sounds I hate	0.14	<b>0.39</b>	0.2	0.2	0.09
19	I try to avoid going to work because of difficulties with sounds	-0.03	<b>0.77</b>	0.09	-0.02	0.09
28	Problems with sounds has meant I don't have many friends	0.19	<b>0.52</b>	0.15	-0.09	0.13
29	My hatred of some sounds creates problems in work	0.08	<b>0.83</b>	0	-0.04	0.09
41	I don't like work because there are lots of sounds I hate	0.04	<b>0.9</b>	0	0.05	-0.03
11	There are some sounds I hate so much, I shout at people	-0.01	0.07	<b>0.4</b>	0.26	0.15
22	I hate people who make sounds I don't like	0.09	0.2	<b>0.6</b>	0.14	-0.01
48	I want to hurt people who make sounds I hate	-0.05	0.12	<b>0.71</b>	0.07	0.11
49	I feel like people make sounds on purpose just to upset me	0.2	-0.12	<b>0.58</b>	0.11	0.16
50	I want to get pay back on people who make certain sounds	0.07	0.03	<b>0.83</b>	-0.05	-0.01
2	Certain sounds make me feel disgusted, even if those sounds don't disgust other people	0.05	0.12	0.1	<b>0.56</b>	0.12
9	Sometimes I leave the room, to avoid telling people off for making bad sounds	0.28	0.12	0.1	<b>0.48</b>	0.06
27	The sound made by some people makes me feel the need to avoid them	0.19	0.21	0.25	<b>0.42</b>	0.01
36	I cover my ears to block out certain sounds	0.02	0.05	0.04	<b>0.54</b>	0.2
37	I've told some people they must not make certain noises around me	0.01	0.1	0.23	<b>0.44</b>	0.15

43	I react more strongly to some sounds if I'm having a bad day	0.24	0.1	0.04	<b>0.53</b>	-0.05
46	I say things aloud in order to avoid listening to bad sounds	0.21	0.11	0.07	<b>0.39</b>	0.1
53	I put on headphones to block out certain sounds	0.23	0.16	0.06	<b>0.46</b>	-0.03
7	It hurts when I hear certain sounds, even if it doesn't hurt other people	0.17	0.07	-0.03	0.07	<b>0.67</b>
12	Sounds often cause me physical pain	-0.06	0.05	0.01	0.01	<b>0.93</b>
26	I feel physical pain if unable to avoid a sound	0.06	0	0	-0.03	<b>0.93</b>
32	I feel pain on my body when I hear certain sounds	-0.03	-0.03	0	-0.01	<b>0.99</b>
<b>Cross-loading or Non-loading items</b> <i>(see Supplementary Information, SI, for factor loading in previous models)</i>						
1	Sounds that other people don't mind can make me really angry					
8	Problems with sounds affect my work life, home life or social life					
10	Not many things in life make me as angry as some sounds					
14	Some sounds make me want to run away from them					
16	Hatred of some sounds makes me want to avoid people					
20	I know my reaction to sounds is extreme					
21	My life is worse than friends who don't find sounds difficult					
34	Hearing certain sounds makes me unable to control feelings of anger					
39	I hate some sounds so much, I want to scream at people who make them					
40	The sounds I don't like make me feel afraid					
45	I copy people to show them how annoying their sounds are					
47	When I visit friends' houses, I'm scared there will be horrible sounds					
52	Certain sounds make me feel rage					

Table shows all items in Part 2 of our measure (Likert-scale items) and their factor loadings. Bold represents factor loadings  $>3.00$ , within one of five factors, named in the table header. Bottom of table shows items that did not satisfy our criteria for any factor. Item numbers (No.) represent ordering within our original questionnaire.

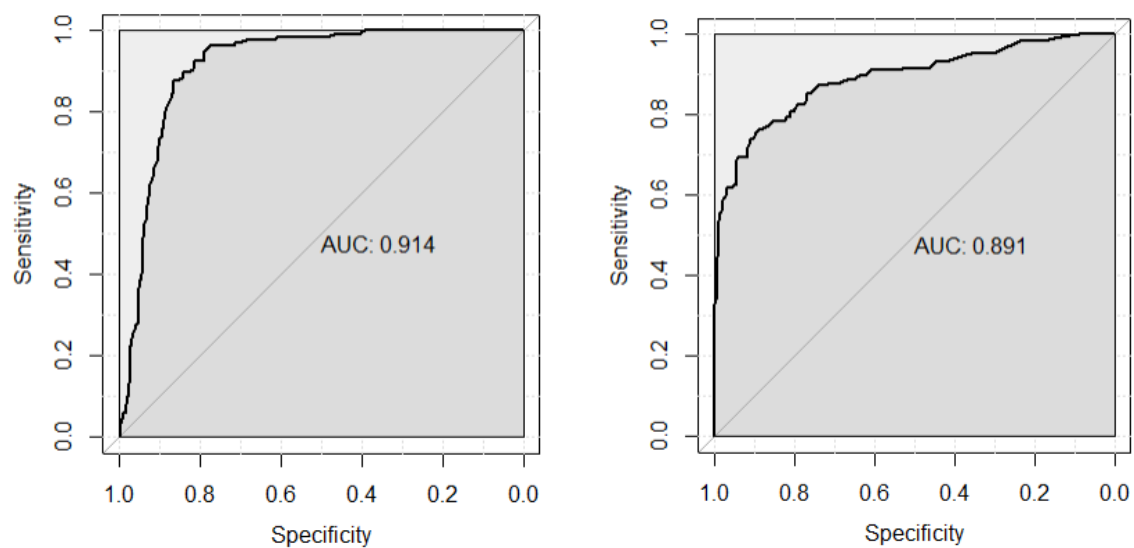
### Establishing a cut-off threshold to identify misophonia: ROC analysis

One aim of the current research is to establish a statistically valid cut-off threshold to identify people with misophonia. To achieve this, we calculated the total score across all 5-factors in the Sussex Misophonia Scale detailed above (i.e., 39 items), where responses were coded 0-4 (from Never, to Always), and scores ran from 0-156. We then subjected participants' total scores to a ROC analysis, to predict whether individuals were from the self-declared misophonia group or control group. This analysis returns an area under the curve (AUC) which

Running Header: SUSSEX MISOPHONIA SCALE

runs from .5 (chance prediction) to 1 (perfect predictive classification). The AUC from our data was .91 (95% CI: .88-.94; see Figure 1 left panel) which means our test is considered to have “excellent” classification accuracy (Mehdi & Ahmadi, 2011). We then selected a threshold in order to maximise both sensitivity (the true-positive rate), and specificity (the true-negative rate) using the *Youden* method (Hughes, 2015; Youden, 1950). In doing so were able to establish the cut-off score threshold for misophonia at 50.5 (out of 156). This threshold will successfully identify 84% of misophonics while excluding 84% of controls. See Figure 1 (left) for the ROC plot.

Figure 1. *ROC curves showing the sensitivity of our test plotted against specificity. Left plot* shows our test to be an “excellent” predictor of group status (misophonics vs. controls) using recruitment streams. **Right plot** shows our test to be a “good-to-excellent” predictor of group status using the MQ threshold (Wu et al., 2014).



Using our new threshold for misophonia, we re-defined our group of participants to now include a group we call *Confirmed Misophonics* (i.e., who scored above threshold; n165, 123 female, 29 male, 9 non-binary, 4 did not report gender) and *Confirmed Non-Misophonics* (i.e., who scored below threshold; n301, 241 female, 52 male, 3 non-binary, 5 did not report gender). This allowed us to produce a table in our Appendix (Table A-1) of descriptive statistics for both *Confirmed Misophonics*, and *Confirmed Non-Misophonics*. These statistics include the

Means, Standard Deviations (SD) and 95% Confidence Intervals, both the overall score, and within each factor. These descriptive statistics can be taken as norming data for future users of our test.

### Concurrent Validity

We next measured convergent validity against an existing validated adult-oriented misophonia questionnaire which participants also completed (MQ, Wu et al., 2014). We analysed this data in two ways. First, we ran a correlation matrix between all elements of the Sussex Misophonia Scale (i.e., total score Part 2, and its five factors) against the MQ (total score, and three sub-scales). The resulting correlation matrix in Table 4 shows significant moderate-to-high correlations, not only within the Sussex Misophonia Scale (Table 4, dark grey shading), and within the MQ (light grey shading), but also across measures (white shading). As expected, smaller correlations (small-to-moderate i.e.,  $r=0.20-0.55$ ) were found between our measure and the MQ Symptoms subscale (named ‘triggers’ in our table, for clarity). This smaller correlation was expected as our own data (Total Score Part 2, plus factors) are based on emotions, behaviours and outcomes, while the MQ scale is based on triggers (which are within our Part 1, but not amenable to this type of analysis).

Table 4.

*Correlation Matrix showing concurrent reliability between Sussex Misophonia Scale and the MQ, with correlations above the 1 displaying correlations for controls, and correlations below the 1 displaying correlations for misophonics.*

		SMS Total	SMS (non-trigger) Factors					MQ total	MQ Sub-scales		
			1	2	3	4	5		Triggers	Emotion behaviour	Severity
SMS Total		1	0.91	0.61	0.55	0.62	0.88	0.66	0.53	0.66	0.52
SMS (non-trigger) Factors	1	0.87	1	0.48	0.44	0.43	0.67	0.6	0.42	0.58	0.44
	2	0.78	0.54	1	0.34	0.41	0.44	0.41	0.26	0.4	0.32
	3	0.69	0.51	0.5	1	0.25	0.33	0.26	0.27	0.19	0.32
	4	0.61	0.35	0.44	0.29	1	0.56	0.44	0.32	0.46	0.35
	5	0.67	0.47	0.49	0.31	0.4	1	0.61	0.55	0.64	0.47
MQ total		0.72	0.53	0.64	0.53	0.59	0.63	1	0.92	0.91	0.61



## Running Header: SUSSEX MISOPHONIA SCALE

MQ Sub- scales	Triggers	0.39	0.20 ns	0.47	0.42	0.06 ns	0.43	0.82	1	0.68	0.59
	Emotion behaviour	0.69	0.5	0.62	0.45	0.65	0.59	0.91	0.51	1	0.51
	Severity	0.57	0.49	0.59	0.37	0.4	0.24	0.57	0.33	0.48	1

Table shows total scores on each sub-scale, as well as the SMS factors (1=Feelings/ Isolation; 2=Life consequences; 3=Intersocial reactivity; 4=Avoidance/ Repulsion; 5=Pain) and MQ Sub-scales. Note that the MQ Sub-scale here called “triggers” is named ‘symptoms’ at source (Wu et al., 2014), and that no SMS factors relate to triggers. This explains the lower correlations between SMS factors and the MQ triggers sub-scale. All other correlations are high, both within our own sub-scales (dark shading) and between measures (white shading). Light grey shadings show our data for correlations within the MQ. *Note.* All correlations are significant at  $p < .001$  except where otherwise shown.

We also used the MQ to verify, in a second way, the statistical value of our own scale and its threshold. Thus far we have categorised participants according to their recruitment stream (as self-referred misophonics vs. general population) or their scores on our Sussex Misophonia Scale (*Confirmed Misophonics* vs. *Confirmed controls*). Here however we begin agnostic to their status, and assign participants to groups using their MQ scores and its published diagnostic threshold (see below). Hence we used the MQ’s single item *Misophonia Severity Scale*. (We remind the reader, this is a rating from 1 (*minimal*) to 15 (*very severe*) where a score  $\geq 7$  indicates clinically significant symptoms; i.e., at least “moderate sound sensitivities” that cause “significant interference”.) Once our groups were re-defined, we had n198 MQ-defined misophonics (159 female/ 26 male/ 7 non-binary/ 6 preferred not to say; mean age 30.03, SD 17.37) and n288 MQ-defined controls (225 female/ 55 male/ 5 non-binary/ 3 preferred not to say; mean age 22.16, SD 9.67). We then re-ran our ROC analysis and found again that our test was a robust measure for identifying misophonics. Our AUC was now .89 (95% CI: .86 - .92) meaning our test is considered “good-to-excellent” (Mehdi & Ahmadi, 2011). The Youden method again established a threshold for misophonia at a similar but slightly lower level of 46.5 in our total scale. See Figure 1 (right panel) for the ROC plot. This analysis adds convergent validity to our measure.

### **Analysing Misophonia Triggers**

Thus far we have considered Part 2 of our Sussex Misophonia Scale (Likert responses for emotions/ behaviours/outcomes). Here we turn to Part 1 (triggers), with two aims. First, we will demonstrate, as expected, that people with misophonia report more triggers (hated sounds) and a wider range of categories than people without misophonia. Then we will analyse how best to use our trigger data as part of the diagnostic criteria for our Sussex Misophonia Scale.

We therefore began by considering our group of Confirmed Misophonics and Non-misophonics (i.e., using our Sussex Misophonia Scale Part2 threshold of 50.5; see above). Confirmed Misophonics had, on average, 16.52 triggers (SD 7.68) across 5.40 categories (SD 1.88) while non-misophonic controls had 6.52 (SD 5.81) and 2.79 (SD 1.91) respectively. This difference was significant in a Welch independent samples t-test for both items ( $t(268.49) = -14.59, p < .001$ ) and categories ( $t(342.32) = -14.18, p < .001$ ), which adds validation to our measure.

Finally, we consider how triggers data (Part 1) can be used within the diagnostic criteria for our Sussex Misophonia Scale. Here we ranked triggers from highest (most common among our Confirmed Misophonics) to lowest (see Table 5). Our proposal here is simple: that misophonics can be identified not only as those scoring above threshold in Part 2 (on feelings/ behaviours/ outcomes of misophonia), *but also* having at least one trigger within the top n aversive triggers experienced by misophonics. This value of n is yet to be determined, so we address this now by identifying the highest ranked trigger of each misophonic. Doing this allowed us to determine that we could capture 99.4% of misophonics as having at least one trigger from our top 39 triggers (specifically, by trigger 38.5, see Table 5). The remainder had indicated no trigger whatsoever (not even any of our ‘other’ options; see Table 2). We return to this finding

in our General Discussion, where we address the implementation of this information within our diagnostic criteria.

Table 5.

*Ranking of Triggers, and the Number and Percent of Misophonics Captured at each Step of Ranking.*

Trigger Ranking	Trigger	Cumulative		Trigger Ranking	Trigger	Cumulative	
		n	%			n	%
1.5	Chewing	131	79.4	26	Foot shuffling		
1.5	Lip smacking	140	84.8	27	Typing		
3	Wet mouth sounds			28	Letters		
4	Throat clearing	149	90.3	29	Accents		
5	Slurping	150	90.9	30.5	Consonants		
6	Sniffing			30.5	Hiccupping		
7	Crunchy foods	151	91.5	32	Sneezing		
8	Crispy snacks			33	Snorting		
9	Swallowing			34	Other_eating		
10	Foot tapping / on floor	156	94.5	35	Other_throat		
11	Pen tapping			36.5	Car	162	98.2
12	Pen clicking			36.5	Other_back-ground		
13	Coughing			38.5	Fridge		
14	Some voices	160	97.0	38.5	Other_voice	164	99.4
15	Finger tapping			40	Other_nose		
16	Snoring			41	Vowels		
17	Breathing			42	Washing machine		
18	Leg rocking			43	Dishwasher		
19	Humming			44	Other_tapping		
20	Whistling			45	Fan		
21	Plastic rustling	161	97.6	46	Other_rustling		
22	Dog barking			47.5	Chair rocking		
23	Burping			47.5	Other_visual		
24.5	Clock ticking						
24.5	Paper rustling				1 person had no listed triggers		

Table shows misophonia triggers (hated sounds) ranked from highest (most common among Confirmed Misophonics) to lowest. Also shown are the cumulative number (n) and percentage (%) of misophonics captured by each successive step in the ranking, when misophonics are represented by one trigger each (their highest in the ranking). For example, the table shows that 99.4% of misophonics (i.e., 164 out of 165) have at least one disliked sound within the top 38.5 ranked triggers. Trigger names are abbreviated where necessary but full names are shown in Table 2.

## General Discussion

Running Header: SUSSEX MISOPHONIA SCALE

In this paper we provided methodology and validation for our novel *Sussex Misophonia Scale*. Our two aims are discussed separately below - to establish a useful validated diagnostic and threshold, and also to explore the factor structure of misophonia.

*Diagnostic criteria for researchers and clinicians.*

Our final *Sussex Misophonia Scale* is a two-part questionnaire, where Part 1 presents misophonia triggers (48 triggers within 8 different categories), and Part 2 determines the feelings, behaviours and outcomes associated with misophonia (39 Likert-scale questions). Our ROC analysis on Part 2 data suggests that the *Sussex Misophonia Scale* is an “excellent” measure to distinguish people with misophonia from controls (and was “good-to-excellent” when validated against an existing measure, Wu et al., 2014). Our analyses also show that we gain maximum sensitivity and specificity with a threshold score of 50.5 or higher (out of 156; in Part 2) which captures 84% of misophonics while excluding 84% of controls. The final questionnaire is shown in our Appendix.

Next, in our Part 1 data, our test allowed us to rank misophonia triggers from most to least common, according to how often they were experienced by our confirmed misophonia group. Furthermore, 99.4% of our misophonics had at least one trigger within the top 39. This step increases confidence in our scale because most misophonia questionnaires on emotion/behaviour/outcome (such as Part 2 here) risk capturing people whose lives are affected by a sound sensitivity, *whether or not this is misophonia*. Consider for example the Severity Scale of the MQ (*Please indicate the severity of your sound sensitivity...*) which arguably applies to any sound sensitivity at all -- and indeed the same is true of many other questionnaires, and indeed certain items within our own scale (e.g., *I have a problem because hearing certain sounds makes me unhappy*). To our knowledge, we are the first to point out this problematic aspect of misophonia questionnaires. However, we argue strongly that our

own (Part 2) questionnaire score does capture misophonia itself, for several reasons. First, we have a number of questions specific to misophonia, and misophonia only (e.g., Factor 4: *Certain sounds make me feel disgusted, even if those sounds don't disgust other people*) and this factor correlates highly with others (at  $0.76 < r < 0.87$ ). Second, we validated our scale on self-declared misophonics suggesting our ROC is indeed indicating success in this domain<sup>1</sup>. However, a third way we can be confident our scale recognises misophonia is to encourage researchers and clinicians to consider whether an above-threshold score in Part 2 co-occurs with at least one misophonia trigger in Part 1. These triggers in Part 1 (e.g., chewing) are radically different types of trigger to other sound sensitivities (such as hyperacusis, linked instead to intense sounds) and, indeed, we took care to ensure this by excluding possible hyperacusis triggers (e.g., sirens).

Our data showed that 98.2% of our misophonics had a trigger within the top 36 ranked triggers, and 99.4% had a trigger within the top 39. One option might therefore be to impose the criterion of a score higher than threshold (in Part 2) *plus* at least one trigger within the top 39 (in Part 1). As noted above, doing this would capture 99.4% of our misophonics. However, we instead suggest a more agnostic standard for triggers, to ensure we do not *a priori* dismiss people with misophonia who happen to have a rare and previously unknown trigger. Hence our final diagnostic criterion for our *Sussex Misophonia Scale* is to pass the ROC-validated threshold of 50.5 (out of 156), but researchers also free to report -- as a descriptive statistic but not a requirement -- whether participants also showed at least one positive response from our list of 48 misophonia triggers, and/or whether they were within the top 39 (as for 99.4% of misophonics here).

---

<sup>1</sup> It is interesting to note that n165 of our sample were misophonic when diagnosed with the Sussex Misophonia scale, while this number was as high as n198 using the MQ - which is based on a broader question about "your sound sensitivity".

Finally, we make a further distinction between researchers and clinicians. While a researcher will likely want to include test participants who pass our (Part 2/ Likert-scale) threshold, we point out that our “excellent” test by ROC standards captures only 84% of our misophonics. Hence for clinicians in particular, we recommend further clinical explorations with an open mind should a patient fall short of this threshold. This difference between clinical and research criteria allows researchers to be conservative, while allowing clinicians to use our measure as just one element in a more comprehensive patient review. Our final test and thresholds are shown in the appendix and are currently available in an online format at [www.misophonia-hub.org](http://www.misophonia-hub.org), where scores are produced automatically at the end of the test.

#### *Factor Structure within Misophonia: A 5-factor solution*

Our analyses also revealed an underlying structure within our data on the behaviours/emotions/outcomes of misophonia (Part 2). Our analyses showed a 5-factor solution, with the following misophonia factors: Feelings & Isolation (having misophonia feels bad, and increases isolation); Avoidance & repulsion (actively avoiding sounds or being repulsed/disgusted by them); Intersocial Reactivity (negative feelings towards others who make sounds), Life Consequences (impacting negatively on work or friendships). A fifth factor was Pain (sounds cause physical pain). This latter is a feature of hyperacusis rather than misophonia, but correlates highly with our other factors, likely reflecting the fact that hyperacusis co-morbid with misophonia (Jastreboff & Jastreboff, 2014). Including this fifth factor within our scale is clinically useful because it can allow clinicians diagnosing misophonia to also observe the possible need for hyperacusis screening (should participants score highly on the pain factor).

This 5-factor solution is also useful because it highlights sub-components to the behaviours/emotions/outcomes of misophonia, and these could be targeted individually with future therapeutic interventions. Indeed, recognising these as interacting but separate factors may lead to more fruitful therapeutic outcomes. For example, a clinician might target the Feelings/ Isolation factor (e.g., *Hatred of some sounds make me feel lonely*) in an intervention which is also mindful of the separate but related aspects of Intersocial reactivity (e.g., *There are some sounds I hate so much, I shout at people*) and indeed any implicated Avoidance/Repulsion (e.g., *Sometimes I leave the room, to avoid telling people off for making bad sounds*). Together these separate factors make up the overall experience of what it means to have misophonia.

In summary, we have produced a concise questionnaire for misophonia, which we found to have excellent properties in distinguishing misophonics from controls. In Part 1 our measure elicits trigger(s), with the expectation that misophonics may indicate at least one for research purposes, and in Part 2, it elicits a 5-factor structure of behaviours, feelings and outcomes, each linked to a life with misophonia.

## References

- Baguley, D. M. (2003). Hyperacusis. In *Journal of the Royal Society of Medicine* (Vol. 96, Issue 12, pp. 582–585). <https://doi.org/10.1258/jrsm.96.12.582>
- Baguley, D. M., & McFerran, D. J. (2011). Hyperacusis and disorders of loudness perception. In *Textbook of Tinnitus* (pp. 13–23). Springer New York. [https://doi.org/10.1007/978-1-60761-145-5\\_3](https://doi.org/10.1007/978-1-60761-145-5_3)
- Bauman, N., & Dozier, T. M. (2013). Misophonia Physiological Response Scale (MPRS). In <https://misophoniatreatment.com/wp-content/uploads/2014/06/MPRS.pdf>.
- Dozier, T. H. (2013a). Misophonia Coping Responses. In [https://misophoniatreatment.com/wp-content/uploads/2016/02/Binder\\_all\\_forms.pdf](https://misophoniatreatment.com/wp-content/uploads/2016/02/Binder_all_forms.pdf).
- Dozier, T. H. (2013b). Misophonia Emotional Responses. In [https://misophoniatreatment.com/wp-content/uploads/2016/02/Binder\\_all\\_forms.pdf](https://misophoniatreatment.com/wp-content/uploads/2016/02/Binder_all_forms.pdf).

- Dozier, T. H. (2015). Treating the Initial Physical Reflex of Misophonia With the Neural Repatterning Technique: A Counterconditioning Procedure. *Psychological Thought*, 8(2), 189–210. <https://doi.org/10.5964/psyct.v8i2.138>
- Dozier, T. H. (2016). Misophonia Impact Survey. In <https://misophoniatreatment.com/wp-content/uploads/2016/02/MIS-1.0.pdf>.
- Fitzmaurice, G. (2010). The Misophonia Activation Scale - MISOPHONIA UK. In <http://www.misophonia-uk.org/the-misophonia-activation-scale.html>. <http://www.misophonia-uk.org/the-misophonia-activation-scale.html>
- Gilhooly, K. J., & Logie, R. H. (1980). Age-of-acquisition, imagery, concreteness, familiarity, and ambiguity measures for 1,944 words. *Behavior Research Methods & Instrumentation*, 12(4), 395–427. <https://doi.org/10.3758/BF03201693>
- Hughes, G. (2015). Youden's index and the weight of evidence. In *Methods of Information in Medicine* (Vol. 54, Issue 2, pp. 198–199). Schattauer GmbH. <https://doi.org/10.3414/ME14-04-0003>
- Jastreboff, P. J., & Jastreboff, M. M. (2014). Treatments for Decreased Sound Tolerance (Hyperacusis and Misophonia). *Seminars in Hearing*, 35, 105–120. <https://doi.org/10.1055/s-0034-1372527>
- Johnson, M. (2014). 50 cases of misophonia using the MMP. *Paper Presented at the Misophonia Conference of the Tinnitus Practitioners Association*.
- Mehdi, T., & Ahmadi, B. N. (2011). Kernel Smoothing For ROC Curve And Estimation For Thyroid Stimulating Hormone. *International Journal of Public Health Research Special Issue*, 239–242.
- Naylor, J., Caimino, C., Scutt, P., Hoare, D. J., & Baguley, D. M. (2020). The Prevalence and Severity of Misophonia in a UK Undergraduate Medical Student Population and Validation of the Amsterdam Misophonia Scale. *Psychiatric Quarterly*. <https://doi.org/10.1007/s11126-020-09825-3>
- Palumbo, D. B., Alsalman, O., de Ridder, D., Song, J. J., & Vanneste, S. (2018). Misophonia and potential underlying mechanisms: A perspective. In *Frontiers in Psychology* (Vol. 9, Issue JUN, p. 953). Frontiers Media S.A. <https://doi.org/10.3389/fpsyg.2018.00953>
- Preacher, K. J., & MacCallum, R. C. (2003). Repairing Tom Swift's Electric Factor Analysis Machine. *Understanding Statistics*, 2(1), 13–43. [https://doi.org/10.1207/s15328031us0201\\_02](https://doi.org/10.1207/s15328031us0201_02)
- Rouw, R., & Erfanian, M. (2018). A Large-Scale Study of Misophonia. *Journal of Clinical Psychology*, 74(3), 453–479. <https://doi.org/10.1002/jclp.22500>
- Schröder, A., Vulink, N., & Denys, D. (2013). Misophonia: Diagnostic Criteria for a New Psychiatric Disorder. *PLoS ONE*, 8(1), e54706. <https://doi.org/10.1371/journal.pone.0054706>
- Vitoratou, S., Hayes, C., & Uglich-Marucha, N. (2018). The S-Five: A psychometric tool for assessing misophonia. In <https://psyarxiv.com/fqbm3/>. <https://doi.org/10.31234/osf.io/fqbm3>
- Wu, M. S., Lewin, A. B., Murphy, T. K., & Storch, E. A. (2014). Misophonia: Incidence, phenomenology, and clinical correlates in an undergraduate student sample. *Journal of Clinical Psychology*, 70(10), 994–1007. <https://doi.org/10.1002/jclp.22098>



Youden, W. J. (1950). Index for rating diagnostic tests. *Cancer*, 3(1), 32–35.  
<https://pubmed.ncbi.nlm.nih.gov/15405679/>

Zhou, X., Wu, M. S., & Storch, E. A. (2017). *Misophonia symptoms among Chinese university students: Incidence, associated impairment, and clinical correlates* ☆.  
<https://doi.org/10.1016/j.jocrd.2017.05.001>

## Appendix: The Sussex Misophonia Scale

### Part 1

We're going to ask you about things you see and hear every day. Have you always hated these things? Or don't you mind them? I hate... (*categories 1-8 are shown on screen; with sub-scale items revealed in the event of a positive response to the category*)

1 the sound of people eating yes/no

Which do you hate hearing? Tick all that apply.

crunchy foods (e.g. apples); crispy snacks; chewing; lip smacking; swallowing; slurping (a drink); wet mouth sounds (e.g., yoghurt); other

2 the sound of repetitive tapping yes/no

Which do you hate hearing? Tick all that apply.

pen clicking; foot tapping/ foot on floor; repetitive barking; tapping pen/ pencil; tapping finger; typing on a computer; other

3 the sound of rustling yes/no

Which do you hate hearing? Tick all that apply.

rustling paper; rustling plastic; other

4 throat sounds yes/no

Which do you hate hearing? Tick all that apply.

throat clearing; hiccups; humming; other

5 sounds people make through their mouth and nose yes/no

Which do you hate hearing? Tick all that apply.

breathing; snorting (e.g., when people laugh); nose sniffing; coughing; snoring; whistling; sneezing; burping; other

6 some voice sounds yes/no

Which do you hate hearing? Tick all that apply.

certain accents; some people's voices; certain letter sounds; certain vowels; certain consonants; other

7 repetitive visual movements yes/no

Which do you hate seeing? Tick all that apply.

repetitive leg rocking; foot shuffling; people rocking back and forth on their chair; other

8 some background sounds (e.g., fridge humming) yes/no

Which do you hate hearing? Tick all that apply.

clock ticking; car engines; refrigerator humming; dishwasher; washing machine/  
dryer; fan; other

## Part 2

How often do these things happen to you? (Likert responses: Never, Hardly ever, Sometimes, Often, Always).

1. Certain sounds make me feel disgusted, even if those sounds don't disgust other people.
2. I have a problem because hearing certain sounds makes me unhappy.
3. I feel no one really understands that I have a problem with sounds.
4. I feel scared hearing sounds I don't like.
5. Other people make fun of me for hating sounds.
6. It hurts when I hear certain sounds, even if it doesn't hurt other people.
7. Sometimes I leave the room, to avoid telling people off for making bad sounds.
8. There are some sounds I hate so much, I shout at people.
9. Sounds often cause me physical pain.
10. I feel guilty because of my reaction to sounds.
11. I worry nobody can help with my sound problems.
12. I don't do well at work because of distractions from sounds.
13. I try to avoid going to people's houses if those people make sounds I hate.
14. I try to avoid going to work because of difficulties with sounds.
15. I hate people who make sounds I don't like.
16. I feel embarrassed about hating certain sounds.
17. Nobody believes my problem with sounds.
18. Hatred of some sounds make me feel lonely.
19. I feel physical pain if unable to avoid a sound.
20. The sound made by some people makes me feel the need to avoid them.
21. Problems with sounds has meant I don't have many friends.
22. My hatred of some sounds creates problems in work.
23. I'm worried about always having problems from hearing certain sounds.
24. I try not to let people know I hate certain sounds.
25. I feel pain on my body when I hear certain sounds.
26. My life is worse because of sound problems.
27. People think I'm crazy because of my reaction to sounds.
28. I cover my ears to block out certain sounds.
29. I've told some people they must not make certain noises around me.
30. Some sounds make me want to scream or cry.
31. I don't like work because there are lots of sounds I hate.
32. I suspect my friends think I'm weird, because of my reaction to sounds.
33. I react more strongly to some sounds if I'm having a bad day.
34. I say things aloud in order to avoid listening to bad sounds.
35. I want to hurt people who make sounds I hate.
36. I feel like people make sounds on purpose just to upset me.
37. I want to get pay back on people who make certain sounds.
38. I think my problems with sounds are getting worse with age.
39. I put on headphones to block out certain sounds.

## Scoring

Running Header: SUSSEX MISOPHONIA SCALE

The passing criterion is based on scores in Part 2.

Part 2. Likert responses are scored 0-4 (0-never; 1- hardly ever; 2-sometimes; 3-often; 4-always) and are then summed to give scores running from 0-156, where the passing threshold is 50.5, meaning scores of 51 or higher indicate misophonia.

Factor 1 (Feelings/Isolation) items: 2, 3, 4, 5, 10, 11, 16, 17, 18, 23, 24, 26, 27, 30, 32, 38

Factor 2 (Life Consequences) items: 12, 13, 14, 21, 22, 31

Factor 3 (Intersocial Reactivity) items: 8, 15, 35, 36, 37

Factor 4 (Avoidance/ Repulsion) items: 1, 7, 20, 28, 29, 33, 34, 39

Factor 5 (Pain) items: 6, 9, 19, 25

Table A-1.

*Norming Data: Means, Standard Deviations (SD) and 95% Confidence Intervals for n165 Confirmed Misophonics and n301 Confirmed controls in our Scale and its Five Factors.*

	Description of Scores	Group (confirmed status)	Mean	SD	Confidence Interval
Overall	Total-Part 2	Misophonics	89.62	23.68	85.98-93.26
		Controls	14.72	13.62	13.17-16.26
Factor 1	Feelings/ Isolation	Misophonics	42.71	11.18	40.99-44.43
		Controls	4.79	6.46	4.06-5.52
Factor 2	Intersocial reactivity	Misophonics	9.37	4.92	8.61-10.13
		Controls	1.04	1.58	0.86-1.22
Factor 3	Life consequences	Misophonics	10.25	6.09	9.32-11.19
		Controls	0.94	1.78	0.74-1.14
Factor 4	Avoidance/ Repulsion	Misophonics	22.33	4.76	21.60-23.06
		Controls	7.23	5.56	6.60-7.87
Factor 5	Pain (Hyperacusis)	Misophonics	7.24	5.24	6.44-8.05
		Controls	0.89	1.86	0.68-1.11

Part 1.

Researchers may wish to present descriptive statistics showing whether participants indicated a trigger within the 48 known trigger items in Part 1. The order of these triggers, from most to least common among our misophonia group, is shown below (but repeated with more detail in

Running Header: SUSSEX MISOPHONIA SCALE

Table 5 above). We found that 98.2% of our misophonics had a trigger within the top 36 ranked triggers, and 99.4% had a trigger within the top 39.

*Misoponia triggers ranked from most to least common:* Chewing, Lip smacking, Wet mouth sounds, Throat clearing, Slurping, Sniffing , Crunchy foods, Crispy snacks, Swallowing, Foot tapping / on floor, Pen tapping, Pen clicking, Coughing, Some voices, Finger tapping, Snoring, Breathing, Leg rocking, Humming, Whistling, Plastic rustling, Dog barking, Burping, Clock ticking, Paper rustling, Foot shuffling, Typing, Letters, Accents, Consonants, Hiccupping, Sneezing, Snorting, Other\_eating, Other\_throat, Car, Other\_back-ground, Fridge, Other\_voice, Other\_nose, Vowels, Washing machine, Dishwasher, Other\_tapping, Fan, Other\_rustling, Chair rocking, Other\_visual.