Acta Psychologica 258 (2025) 105179

Contents lists available at ScienceDirect

Acta Psychologica

journal homepage: www.elsevier.com/locate/actpsy

Trypophobia discomfort depends on viewing context manipulation

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ARTICLE INFO

Keywords:
Trypophobia
Context
Anxiety
Viewing discomfort
Trigger warning

ABSTRACT

Trypophobia is the extreme negative reaction to clusters of circular objects. The present preregistered study investigates how context impacts trypophobic reactions through basic situational priming / cognitive appraisal paradigms. Participants were randomly assigned to view trypophobic imagery under one of three conditions: no prompt (control), art gallery exhibition (distraction from trypophobia), or trypophobia-inducing. Results showed that trypophobic reactions depended on rater's level of trypophobia, but also on the situational context. Both high- and low-trypophobic individuals were more comfortable in the trypophobia-inducing context compared to their respective control group. Low-trypophobic individuals found the art gallery condition images the most uncomfortable to view, while high-trypophobic individuals found this condition to be the most comfortable to view. Providing social context or trigger warnings led to less viewing discomfort for those who were strongly-trypophobic. Although age and anxiety levels did not impact the main findings, we found that both play a small role in trypophobic manifestation. Considering age, we argue that older age might be responsible for lower trypophobic tendencies compared to the social learning model of trypophobia. To summarize, these results show that trypophobic reactions can be affected by context, which may help future clinicians and those severely impacted by such imagery.

1. Introduction

Trypophobia is the extreme discomfort towards images containing closely packed circular objects, often holes (Cole & Wilkins, 2013). Previous work shows that strong negative reactions towards such images have prevalence rates spanning from about 7 % to almost 24 % (e.g., Pipitone & DiMattina, 2020; DiMattina et al., 2024), with larger samples showing similar, narrower rates, from 10 % (Cole et al., 2024) to 18 % (Wong et al., 2023). This is still higher than the rates of other specific phobias combined known to date, as the DSM-V lists prevalence rates in the US for specific phobias between 7 % and 9 %, with lower rates being reported European and Asian countries (American Psychiatric Association, 2013). But in a few countries, slightly higher rates can be found, for example in The Netherlands at around 12 % (Depla et al., 2008). Invariably, comparing the rate of trypophobia to any one other common specific phobia is higher, for example to 2 to 3 % for ophidiophobia (fear of snakes, Polák et al., 2016) and 3 to 6 % for arachnophobia (fear of spiders, Polák et al., 2022). Although some researchers argue trypophobia meets the criteria to be listed among other specific phobias in DSM-V, it is currently not mentioned in the manual as an example of a viable phobia (see Thiebaut et al., 2024 for a review).

Common reactions from viewing trypophobic imagery such as the lotus seedpod and honeycomb include shortness of breath, increased heart rate, skin-itching, disgust, nausea, and fear (Kupfer & Le, 2018; Le et al., 2015; Vlok-Barnard & Stein, 2017). Considering this high prevalence and the severity of trypophobia symptoms, trypophobia could be considered a serious potential psychological threat. Trypophobia has been shown to be related to multiple psychological traits and disorders, such as disgust sensitivity, disease avoidance, distress proneness, generalized anxiety, and major depressive disorder (Imaizumi et al., 2016a; Kupfer & Le, 2018; Vlok-Barnard & Stein, 2017; Wong et al., 2023), however others have found it to be minimally or unrelated to traits like anxiety (Le et al., 2015; Pipitone et al., 2022; Pipitone & DiMattina, 2020).

In the present study, we examine whether certain context scenarios impact judgements of trypophobic discomfort. Specifically, we test whether trypophobic reactions are at some level context-dependent – in other words, could certain situations lead to aggrandized or mitigated reactions depending on brief cognitively appraised scenarios. Depending on how someone appraises an emotionally salient situation (e.g.,

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https://doi.org/10.1016/j.actpsy.2025.105179
Received 28 December 2024; Received in revised form 16 May 2025; Accepted 11 June 2025
Available online 16 June 2025

watching a disgusting film using re-appraisal or suppression mechanisms) can impact the emotions one ultimately feels (Gross, 1998). Emotion regulation can change the intensity of emotions (Ochsner & Gross, 2005), and active cognitive regulation can suppress negative experiences (Gross, 2002). In clinical settings for extinguishing arachnophobia, the level of experienced discomfort when exposed to spiders depends on whether the context of that exposure is different or similar to the one experienced during the therapy session (with only the similar context showing a decrease in fear; Mystkowski et al., 2002). Therefore, the same context dependency could apply to trypophobia as well. For instance, Yamada and Sasaki (2017) directly proposed an Involuntary Protection Against Dermatosis hypothesis, according to which trypophobic reactions result from an evolutionary aversion to skin diseases. Shirai and Ogawa (2021) showed that individuals who were shown words related to skin disease reported more discomfort to trypophobic imagery (however this effect was not replicated in a follow-up experiment). In essence, activating a schema of skin disease (which is a robust component of trypophobia, e.g., Kupfer & Le, 2018; Pipitone et al., 2022; Yamada & Sasaki, 2017) may lead to more powerful trypophobic reactions. This is in line with recent work of Cole et al. (2024), who showed that trypophobia can be partially attributed to social learning and frequent exposure to excessive information on the subject. Both instances show how context can influence trypophobic reactions to some extent. Based on these findings, we argue that certain priming stimuli or situations could not only increase discomfort, but also that other scenarios may *decrease* image discomfort through natural cognitive regulation or appraisal frameworks (Gross, 2002; Ochsner & Gross, 2005), leading individuals to experience different (or reduced) emotional reactions.

Notably, two opposing frameworks trying to explain the phenomenon of trypophobia are also context-based. The aforementioned *skin disease framework* assumes that holes may trigger an unpleasant response due to aversive connotations of human skin disease (for example smallpox, scabies, impetigo). An alternative, but also evolutionary based framework is the *dangerous animal framework,* which assumes that certain dangerous animals such as venomous snakes or poisonous frogs have skin patterning that resembles trypophobic clusters, which may have evolved as an adaptation to avoid such visual cues (Cole & Wilkins, 2013). However, in a study which directly compared trypophobic stimuli artificially superimposed onto skin or dangerous animals (spiders, snakes), results showed that trypophobic skin patterns led to more discomfort (Pipitone et al., 2022). The discomfort experienced with trypophobic reactions can be a mix of fear and disgust. Dangerous animals evoke fear in humans, whereas skin diseases are predominantly disgust driven (Pipitone et al., 2022). Studies that directly compare the intensity of the two emotions experienced during trypophobic reactions show that although both affective states are experienced, it is disgust that dominates over fear (Kupfer & Le, 2018; Thiebaut et al., 2025; Vlok-Barnard & Stein, 2017).

It is somewhat surprising that trypophobia has only been studied scientifically until very recently given the prevalence rates and potential symptom severity it inflicts on those seriously affected. Sampling biases in current trypophobia research may exist, as most work to date has sampled those raised in Western, Educated, Industrial, Rich, Democracies, known as WEIRD populations (Henrich et al., 2010). One defining difference between WEIRD and non-WEIRD populations is access to technology - the internet and social media. Recent work has shown more discomfort among urban than rural inhabitants in Asia (Zhu et al., 2020). However, age differences also exist, with previous work showing higher trypophobia prevalence among younger individuals (Cole et al., 2024; Imaizumi et al., 2016b) – hence there may be social, learned, as well as biological/lifespan components to trypophobic tendencies.

1.1. *Present study*

In the present study, we collect data from WEIRD populations, albeit from two different sources – one that constitutes a typical (younger) research sample (university setting in the US and another from the online data collection source, Prolific (where most participants were older and from the UK). The goal of the study was to increase or decrease participant awareness of trypophobia prior to presenting trypophobic images in three different ways. Our initial prediction was that if individuals are presented with trypophobic imagery that is unrelated to trypophobia, or put within a social context that may normalize viewing different types of images (like an art gallery exhibition), individuals would be more comfortable in viewing those images compared to those that received a trypophobic-inducing description, or no description at all. Additionally, we predicted a larger shift within context conditions among those who score higher on trypophobic tendencies (as measured by the TQ, see methods section) accompanied by lower overall comfort ratings, as Pipitone et al. (2022) found TQ levels to significantly impact comfort ratings towards manipulated images.

2. Methods

The presented study was approved by the Institutional Review Board of Florida Gulf Coast University. At the beginning of the experiment, participants had to read over the consent form and agree to participate in the study by marking the appropriate checkbox in Qualtrics. Informed consent was obtained from all participants. The central hypotheses and planned analyses of the study were preregistered and are available at: https://aspredicted.org/Z78_8Q4. The major question and three major hypotheses were:

General Question: Does labeling with certain contexts affect perceptions of trypophobic images?

H1. A label that insinuates trypophobic tendencies will increase discomfort elicited by trypophobic images.

H2. A label that distracts from trypophobic content of images will decrease discomfort elicited by trypophobic images.

H3. These effects will be stronger among participants that we identify as having high levels of trypophobia.

2.1. *Participants*

Participants were recruited using two methods: 159 participants were recruited from the general psychology pool at Florida Gulf Coast University where they received classroom credit for participation, and 197 participants were recruited from Prolific (66 % of participants were from the UK, 11 % from USA, 22 % from other countries), and were remunerated with an equivalent to $8 USD for participating in the study.

In accordance with the preregistration, based on the central analysis of a 3 × 2 between-subjects ANOVA design (described below), using an alpha level of 0.05 and 80 % power as a threshold, the minimum number of participants was 158. We achieved this criterion but continued to collect data, as we noticed that the Prolific participants were noticeably older, hence we wanted to investigate age as a post-hoc factor considering other work that has shown age to play a role (e.g., Cole et al., 2024; Zhu et al., 2020). We excluded participants who provided incomplete responses to the majority of the survey questions ($N = 32$). Our final sample comprised 358 participants. See Table 1 for descriptive statistics.

2.2. *Materials*

We used the GAD-7 (Spitzer et al., 2006) to assess generalized levels of anxiety. It comprises 7 items relating to the frequency of one's anxiety experiences throughout the last two weeks. We used the Trypophobia Questionnaire (TQ, Le et al., 2015) to quantify trypophobia levels, using

Table 1
Descriptive statistics of variables collected from participants in the study.

Variable	University Sample (N = 161)	Prolific (N = 197)	High TQ Scores (N = 165)	Low TQ Scores (N = 193)
Age	19.47, 2.12**	33.6, 13.27**	25.26, 9.68*	28.93, 13.73*
Sex				
Male	(21.7 %)	(47.2 %)	31.65, 11.98[a] (37.6 %)	18.31, 1.45[a] (34.2 %)
Female	(75.2 %)	(48.2 %)	36.76, 15.91[a] (58.8 %)	18.41, 1.47[a] (61.7 %)
GAD-7 Scores	8.48, 5.3	6.94, 5.42	9.1, 5.28**	6.38, 5.22**

Values = Mean, SD (or %).
[a] Indicates mean and standard deviation of TQ levels for each sex in each TQ category.
* $p < .01$.
** $p < .001$.

a 5-point Likert scale for 17 possible reactions (e.g., *Feel itchiness*, *Chills*, *Feel uncomfortable or uneasy*, ranging from *Not at all*, to *Extremely*). Scores of 31 or higher are considered trypophobic (Le et al., 2015), with 70 participants (19.6 %) meeting this criterion in the current dataset. To divide participants into high vs. low TQ levels, a median split (TQ scores higher than 21 considered for the high TQ condition) was done on the TQ variable, with 193 (54 %) being in the low TQ condition, and 165 (46 %) being in the high TQ condition.[1] The trypophobic stimuli were 10 images of clustered hole structures (e.g., barnacles, or lotus pod; see supplementary materials for all images). These images were chosen based on their ability to illicit trypophobic reactions, either from previously published work (Pipitone & DiMattina, 2020; DiMattina et al., 2024) or from websites dedicated to trypophobic stimuli (such as trypophobia.com). The images were presented one at a time, and they varied in size from 480 × 360 pixels to 1280 × 720 pixels. Regardless of the size differences, the images clearly depicted clusters of circular objects / patterns / holes. The participants were asked to rate each of the pictures independently on three scales. First, the comfort level while looking at the image was assessed using a Likert-type scale ranging from −5 (*Extremely uncomfortable*) to 5 (*Extremely comfortable*). Second, participants rated how artistic a given image is, using a similar scale. Third, the likelihood of going to their local art gallery to view such images if there was an exhibition in their area was assessed. We also asked the participants about their sex, age, and any previous diagnosable clinical phobias and/or disorders.

2.3. Procedure

We used Qualtrics online platform to collect the data. To see if context could impact image ratings, we randomly assigned participants to one of three groups: a) a control group, where participants were simply instructed to provide ratings of the images shown; b) a trypophobia-inducing group, where participants were told that they were about to see trypophobic images and then were given a brief description of what trypophobic reactions could entail (with a focus on symptom severity); and c) a trypophobia-distracting group, where participants were told that they were about to see images from a post-modern photography art exhibition entitled “The Void,” which recently debuted in Central Europe.

For both the art gallery and trypophobic conditions, participants were asked to reiterate what condition they were in as a manipulation check. For the control condition, they were asked to select a specific number from an array of numbers as a manipulation / attention check. One participant did not pass the manipulation check and was removed from the analysis. Please see the supplemental materials section for the full descriptions provided in each condition. Regardless of the condition, the same 10 trypophobic images were shown in a randomized fashion. At the end of the survey, the Trypophobia Questionnaire (TQ) and GAD-7 were implemented, followed by demographic questions. Average TQ scores were not significantly different among participants randomly assigned to the three different context conditions, $F(2,353) = 1.26$, $p = .29$.

2.4. Analytical approach

Based on our pre-registered analyses mentioned above, we ran a 3 (context condition: control, trypophobic, art gallery) X 2 (TQ level: high vs. low) between-subjects ANOVA on levels of comfort when viewing trypophobic images using the GLM procedure in SPSS version 29 (IBM, USA). We then ran the same analysis but factored in anxiety levels as measured by the GAD-7 as a covariate. We also assessed how high and low TQ individuals rated the artistic quality of an image and the likelihood of attending an art gallery with such pictures exhibited. Last, the major post-hoc analysis factored in age as a covariate.

3. Results

3.1. Pre-registered analyses

The 3 × 2 between-subjects ANOVA revealed a significant main effect of context condition, $F(2,350) = 3.36$, $p = .036$, $\eta^2 = 0.019$. Comfort level was the lowest for the control group ($M = -0.32$, $SD = 1.97$) then for the art gallery group ($M = 0.05$, $SD = 1.59$), and the highest for the trypophobic group ($M = 0.36$, $SD = 2.05$). Follow-up multiple comparison Tukey tests revealed that only the control and trypophobic conditions were significantly different from one another ($p = .004$). The main effect of TQ level was also significant, $F(1,350) = 114.37$, $p < .001$, $\eta^2 = 0.25$, indicating those who scored higher on the TQ ($M = -0.99$, $SD = 1.6$) were more uncomfortable viewing the images in general than low TQ individuals ($M = 0.88$, $SD = 1.7$). The interaction of both variables on comfort levels was also significant, $F(2,350) = 5.42$, $p = .005$, $\eta^2 = 0.03$; see Fig. 1, which shows different comfort level responses to the context groups and also TQ levels. Inspecting the interaction by analyzing comfort level differences across the context condition among those who scored low on the TQ revealed a simple main effect, $F(2,190) = 3.86$, $p = .023$, $\eta^2 = 0.039$. Those in the trypophobic condition had the highest comfort level ($M = 1.29$, $SD = 1.87$) followed by those in the control condition ($M = 0.91$, $SD = 1.67$), last by those in the art gallery condition ($M = 0.49$, $SD = 1.47$). The only significant follow-up Tukey test comparison was between the art gallery vs. the trypophobic condition ($p = .017$).

Among those who scored high on the TQ, the simple main effect of context condition was also significant, $F(2,160) = 5.46$, $p = .005$, $\eta^2 = 0.064$. Those in the control condition were the most uncomfortable ($M = -1.5$, $SD = 1.48$), followed by the trypophobic condition ($M = -0.78$, $SD = 1.64$) and last the art gallery condition ($M = -0.58$, $SD = 1.56$). Significant follow-up Tukey test comparisons were found between the control and art gallery condition ($p = .006$), and the control and

[1] We were confident in the formation of this variable since previous work used TQ scores as a quantitative variable (DiMattina et al., 2024 - where the experimental paradigm allowed for linear mixed effect modeling) and showed very similar results to the categorical TQ variable in regular ANOVA models.

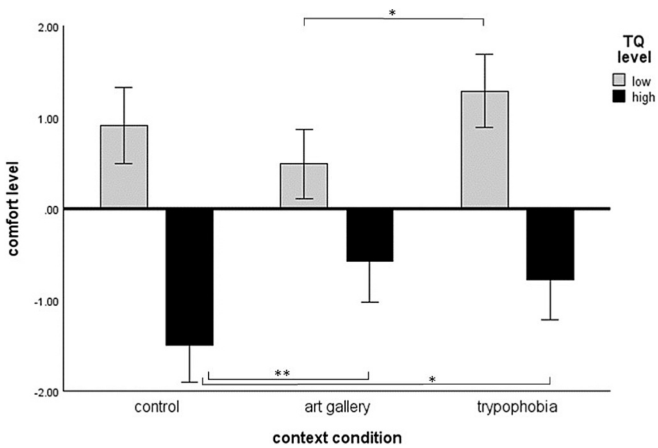

Fig. 1. The interaction between viewing context condition and TQ scores on comfort levels.
For those scoring low on the TQ, comfort levels were the lowest when prompted to view trypophobic images in an art gallery condition. Conversely, for those high on the TQ, no prompt led to the lowest comfort rating, with the art gallery condition leading to the highest comfort ratings. * = $p < .05$, ** = $p < .01$.

trypophobic condition (p = .042), but not for the art gallery vs. trypophobic condition (p = .78). See Fig. 1 for a graphical depiction of all mean comfort level differences.

Re-running the same analysis as above but with GAD-7 scores entered as a covariate revealed similar findings. There was no main effect of GAD-7 levels, $F(1,349) = 0.62$, $p = .43$, $\eta^2 = 0.002$. The main effect of context condition continued to be significant, $F(2,349) = 3.34$, $p = .037$, $\eta^2 = 0.019$, as well as the main effect of TQ level, $F(1,349) = 103.41$, $p < .001$, $\eta^2 = 0.23$ and the interaction of both context condition and TQ levels, $F(2,349) = 5.55$, $p = .004$, $\eta^2 = 0.031$.

In addition to providing comfort level ratings, participants in the art gallery condition were also asked, 1) "*How artistic do you find this photo to be*?" and 2) "*If this photo was to be shown at your local art gallery as a part of a temporary exhibition, how likely would you go and see it*?" Results showed there were no differences in the artistic ratings of images among participants who were categorized as being high or low on the TQ, $t(118) = 0.42$, $p = .679$, $d = 0.08$. The same was true for the likelihood of attending the art exhibit; there were no differences in how likely participants would be to attend an art exhibit comprised of the trypophobic images as a function of scoring high or low on the TQ, $t(119) = 0.923$, $p = .358$, $d = 0.17$.

3.2. Post-hoc analyses

Since data collection was conducted from a conventional university setting and from the online platform Prolific, our data included a large age range of participants (range = 18–72). Prolific participants were significantly older than the university students, see Table 1 for details. Therefore, we explored how age impacted the findings above. Before this, inspecting age visually and testing the variable for skewness revealed it was significantly positively skewed. Therefore, we rank-ordered the variable to minimize any outliers, then performed a log 10 transformation following non-normality guidelines provided in Tabachnick and Fidell (2007), which improved the variable's skewness considerably. When factored into the original 3 × 2 factorial ANOVA model as a covariate, age did not change the interaction or main effects shown above, however it did significantly impact overall comfort levels, $F(1,339) = 19.97$, $p < .001$, $\eta^2 = 0.056$. Those who scored high on the TQ were significantly younger than those who scored lower on the TQ, see Table 1. The relationship between TQ levels and age was also assessed after rank ordering and log 10 transforming the TQ variable as described above with the variable age, as it was skewed. This improved the multivariate normality (decreased heteroscedasticity), but the relationship remained similar whether using transformed data or not; transformed TQ scores and age were significantly related, $r(358) = -0.156$, $p = .003$. Although GAD-7 scores did not impact the main analyses above, they were significantly related to transformed TQ scores, $r(358) = 0.282$, $p < .001$ (see Table 1 for mean differences between TQ groups). We also investigated sex differences in TQ and GAD-7 scores. There were no sex differences in average TQ scores $t(342) = 1.304$, $p = .193$, $d = 0.15$. But, females did score higher ($M = 8.27$, $SD = 5.64$) on the GAD-7 compared to males ($M = 6.4$, $SD = 4.6$), $t(342) = 3.16$, $p = .002$, $d = 0.35$.

4. Discussion

4.1. Main findings

Randomly assigning participants to view trypophobic images under different context scenarios significantly impacted comfort ratings, but the way comfort levels changed was highly dependent on trypophobia levels (as measured by the TQ), as seen in the interaction between context condition and TQ levels, see Fig. 1.

For individuals scoring low on the TQ, the priming condition (providing information on trypophobia) led to the highest comfort ratings compared to the art gallery condition (viewing the images as a part of an art gallery exhibition) which was rated the lowest in comfort, with the control condition (simply viewing trypophobic imagery with no prompt) falling in between and was not significantly different from the other conditions. Those scoring high on the TQ rated images in all conditions much lower in comfort compared to low TQ individuals, on average. Trypophobic images viewed in the control condition were rated significantly lower in comfort compared to the trypophobic priming condition and art gallery condition, with no differences found between the art gallery and trypophobia priming conditions.

We originally hypothesized (H2) that viewing trypophobic imagery under a distraction label (art gallery) would lead to higher comfort ratings, while priming individuals with information on trypophobia severity (H1) would lead to less comfort. While the former was true for high TQ individuals, the latter was not true for either group. Preparing individuals to view trypophobic imagery led to higher comfort ratings compared to the other conditions within respective high and low TQ categories, with significant differences found among high TQ individuals. This seemed to allow for proper cognitive preparation and appraisal for subsequent image viewing, which comports with cognitive appraisal theories of negative emotion regulation, whereby participants could prepare, evaluate and minimize their discomfort towards these images (Gross, 2002; Ochsner & Gross, 2005). Importantly, our results add to the literature on trigger warning effects and contradict more recent conclusions that trigger warnings paradoxically lead to an increase in one's sensitivity (Bellet et al., 2018). We report that for those more susceptible to trypophobia, being warned prior to image exposure led to lower levels of discomfort. However, two points need to be addressed considering trigger warnings; The target population and wording used. Most studies on trigger warning usually sample a general population (e.g., Bellet et al., 2018) which may not be prone to a particular trigger warning influence. Perhaps studies on trigger warnings should focus particularly on the extremes of the population of interest (with a focus on those being most sensitive). The second point relates to the language used. In our study, the trigger warning condition was a rather vivid description of possible negative reactions some have when viewing trypophobic imagery. According to a recent study from Willems et al. (2025), the wording used in trigger warnings can make a large difference on their psychological impact - namely that detailed trigger warnings make people feel more respected. In short, the actual content of trigger warnings can have its own influence on people. Future studies on the matter should consider these findings and perhaps include an individual's trait vulnerability as a moderator for potential trigger warning effects. Interestingly, for those in the low TQ category, the art gallery condition led to the lowest comfort ratings compared to the trypophobia priming condition. This was not expected but could be due to the situation participants were put in – viewing imagery under the pretext of an art gallery exhibition. Work shown in an art gallery is probably thought to be aesthetically pleasing to view. Even for those who are not trypophobic, this type of imagery can invoke a slight autonomic nervous system response (Pipitone et al., 2017) and while not revolting to view, under the context of viewing art, low TQ individuals might not have been impressed with the artistic qualities of trypophobic imagery and rated them more uncomfortable to view. In the trypophobia priming condition, being prepared to view such imagery but not being trypophobic led low TQ individuals to rate these images higher in comfort. The control condition - where participants were simply shown images with no prompt and asked to rate their level of comfort - ratings were not significantly different between the latter two conditions for low TQ individuals. Related to this was the last tested hypothesis (H3), showing that comfort ratings did have a greater shift across the different context conditions for high TQ compared to low TQ individuals, as shown by the effect size differences in the simple main effects from the main analysis.

Based on the findings, the control condition (with no prompt to viewing trypophobic imagery) can be thought of images being "sprung on" raters, thus high TQ individuals rated tryopophobic images as least comfortable to view in this context. This was not the case for low TQ individuals, who based on their ratings, found these images somewhat pleasant to view when presented with no warning. In a broad sense, emotion regulation can be thought of as using strategies (cognitive or behavioral) to decrease or increase the intensity of emotions (Ochsner & Gross, 2005) and can mitigate negative experiences (Gross, 2002). How individuals who score high or low on the TQ conceptualize tryopophobic imagery based on different context conditions will be an interesting investigation for future work. What can be gleaned from this study is that the context in which trypophobic images are viewed can influence comfort levels of images with clusters of circular objects. Previous work shows that by superimposing trypophobic imagery onto images of human skin leads larger changes in discomfort compared to the same manipulation of dangerous animal images, with larger effects for high TQ individuals (Pipitone et al., 2022). Other work shows that the phase spectrum of an image, namely the "whats" of an image, the image context, plays a much larger role in changing viewing comfort compared to the amplitude spectrum, or the image energy profile (Pipitone & DiMattina, 2020). These findings, coupled with the present data suggest that context does matter to some extent when viewing tryopophobic imagery.

4.2. GAD and age-related findings

Factoring in levels of anxiety did not impact the main findings of the current study, nor did it statistically influence comfort levels on its own. There was however a significant positive zero-order correlation between TQ scores and GAD-7 scores ($r^2 = 8$ %). This finding is similar to the results of other work showing that while GAD-7 and TQ scores may correlate statistically by themselves, they do little to impact how TQ scores affect comfort levels when entered into an ANOVA model simultaneously (see Pipitone et al., 2022). Some work shows trypophobia to be comorbid with anxiety and other psychological features of distress (e.g., Vlok-Barnard & Stein, 2017; Wong et al., 2023), however other work shows these relationships to be negligible (e.g., Le et al., 2015; Pipitone & DiMattina, 2020). Thus, while trypophobia tendencies may covary with other psychological features of distress, it "stands on its own" as a unique trait.

Aside from our pre-registered analyses, we found age to be a significant factor in comfort levels, however controlling for it statistically did not impact the findings above. Those in the high TQ category were significantly younger than those in the low TQ category, with a significant (albeit weak) negative correlation between age and TQ levels. This effect was recently shown within a large sample conducted across various age categories from the UK – with older individuals scoring lower on the TQ (Cole et al., 2024). While Zhu et al. (2020) show that trypophobia discomfort was higher in Chinese and Japanese urban vs. rural populations, individuals from rural areas were significantly older as well. Trypophobia has also been observed in preschool children (e.g., Suzuki et al., 2023) who would have had limited exposure to internet and social media references depicting trypophobia. Therefore, age is a confounding variable when considering how the social learning paradigm within urban landscapes and internet use impacts trypophobia prevalence. Previous work shows that across the lifespan, the processing of negative emotion recedes, presumably from better cognitive control of emotion regulation (Nashiro et al., 2012), hence older individuals may not be as affected by trypophobic tendencies as younger individuals. We urge future researchers to directly explore how trypophobia is conceptualized across the lifespan.

CRediT authorship contribution statement

R. Nathan Pipitone: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Michal M. Stefanczyk:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Methodology, Investigation, Funding acquisition, Conceptualization.

Funding details

This work was funded by "Incubator: Being Human" project at the University of Wrocław within the "Excellence Initiative - Research University" programme (Young Researcher Grant 2023-25 for MMS).

Declaration of competing interest

None.

Acknowledgements

We thank Francesca Monteferrante for helpful suggestions on a previous version of this manuscript.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.actpsy.2025.105179.

Data availability

Data will be made available on request.

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