Feedback familiarity explains why some students don't like peer review: Understanding why using a stressor-strain-outcome framework

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Computer-based peer review systems have received extensive attention due to their rapid development and broad application. Although studies have generally found strong assessment validity and positive learning effects, several have found negative reactions in students. More work is needed to understand the reasons for students' negative reactions to an approach that generally shows benefits for students. Applying a stressor-strain-outcome framework, this study established the influence mechanism from feedback familiarity to students' negative reactions and examined information-related stressors (overload and narrowing) underlying students' negative reactions to familiarity of peer feedback. The results show that peer feedback is often perceived as having high familiarity, which is related to perceptions of information narrowing and information overload, which in turn were related to students' feeling exhausted, which in turn produces psychological reactance and decreased willingness to continue using peer feedback. This study extends our knowledge of students' negative responses to peer feedback through peer review platforms. Implications for theory and practice are discussed.

Implications for practice or policy:

- Course leaders could avoid redundant, overly familiar feedback through algorithms that assign diverse reviewers and targeted prompts.
- Course leaders could reduce information redundancy by limiting the number and breadth of reviews, providing tools to summarise or filter comments, and training students to process feedback effectively.
- Students could offset information narrowness and increase awareness of their learning by integrating self-reflection prompts or learning journals.

Keywords: peer feedback, feedback familiarity, information characteristics, stressor-strain-outcome (SSO) framework, negative reactions

Introduction

Computer-based peer review uses interactive systems (e.g., Turnitin, CPR, Peerceptiv, PeerScholar) that enable students in small or large courses to review peers' tasks online (Whicher et al., 2018). In particular, students interact with other learners in the same class by both providing feedback and receiving feedback, often structured by rubrics and guidance in the online system. As a student-centred teaching practice, peer review typically provides students with both comments and ratings. When the focus is on comments, it is often called peer feedback; when the focus is on ratings, it is often called peer assessment (Rotsaert

et al., 2018). Peer review has been applied to a variety of curriculum tasks, such as audio presentations (Min, 2016), essay writing (Kuyyogsuy, 2019) and project designs (Whicher et al., 2018). Peer feedback continues to involve some advantages over teacher and AI-produced feedback (Banihashem et al., 2024). Students can learn from reading their peers' documents, through providing feedback or through receiving suggestions (Zong et al., 2021). Theoretically, peers within a zone of proximal development (ZPD; Vygotsky, 1978) (i.e., of similar abilities) can find problems and provide targeted suggestions. Extensive studies have refined criteria for grouping students to enhance effective learning, such as equal achievements (Buttaro & Catsambis, 2019), course commitment and compatible schedules (Hastings et al., 2018).

Although peer similarity can lead to more understandable and specific suggestions in peer feedback, there are challenges as well that need researchers' attention. Indeed, the main purpose of peer feedback is to satisfy students' knowledge needs and provide high-quality information for students through feedback interaction (Noroozi et al., 2025). However, even though studies have identified antecedents of students' reactance, such as the influence of receiving feedback on the learning performance and the influence of feedback emotions on adoption behaviours (Patchan et al., 2018; Zhao et al., 2013), researchers have paid less attention to information-related characteristics of peer feedback that trigger students' negative responses. Theoretically, the benefits of peer feedback depend on a positive knowledge interaction between students, and negative responses will weaken students' participation. Thus, clarifying students' negative responses to feedback familiarity is a crucial step towards finding deficiencies in peer feedback and thereby further improve students' participation and resulting learning outcomes.

When the information characteristics of peer feedback fail to meet students' needs, they can become a source of pressure, inducing students' negative responses. For example, students often worry about whether feedback provided by peers is of the same quality as that of teachers (Liu & Carless, 2006). One way they might judge the relative quality of the peer input is its familiarity: if the feedback content seems very familiar, then the inference is that it is not providing new information and therefore of lower quality than what a more expert individual (i.e., a teacher) would have provided. However, other factors might also influence reaction to peer feedback and its information characteristics, such as how aware students are of their own learning process. Therefore, the research questions guiding this study were: Does familiarity with peer feedback lead to negative reactions in students? If so, how and through what mechanisms? To address these questions, we applied the stressor-strain-outcome (SSO) framework (Koeske & Koeske, 1993), where the stressor is feedback familiarity, the outcome is negative reaction to peer feedback, and examined several mechanisms, conceptualised as strains.

Theoretical background

Students' negative reactions to peer review

The benefits of peer review critically depend upon students' full participation in peer feedback interaction processes (Zong et al., 2021). Therefore, extensive research has focused on promoting positive student reactions to peer feedback (Bader et al., 2019; Fan & Xu, 2020). The characteristics of peer feedback that students experience likely determine whether students will continue to be willing to engage in such interactions (Wu & Schunn, 2022), and any weakening of such engagement will likely affect the benefits of peer review. Careful examination of students' negative reactions can provide system designers and educators with new opportunities to better identify problems and eliminate obstacles.

Negative student reactions to participating in online interactive learning can be classified into two categories: psychological reactions and behavioural reactions (Loh et al., 2021; Shi et al., 2020). In terms of psychological reactions, many studies have recognised the importance of students' motivation and conducted extensive research on how to improve students' motivation to participate in classroom peer review activities (Gao et al., 2025; Liu & Carless, 2006; Patchan et al., 2018; Zhao et al., 2013). However, this line of work has not specifically looked at psychological reactance, the motivational tendency to maintain or restore freedoms perceived as threatened or lost (Lewing & Caraway, 2019). Empirical

research on recommender systems has found that users' perception of recommended content is related to psychological reactance (J. V. Chen et al., 2019; G. Lee & Lee, 2009). Although studies on peer feedback have revealed several specific student concerns about the validity of peer ratings or the helpfulness of peer feedback (Patchan et al., 2018; Winstone, 2017), the relationship between the features of peer feedback and psychological reactance has not been studied.

In terms of behavioural reactions to peer feedback experiences, some students come to provide only very short comments or provide no comments at all. Many studies have examined the antecedents of discontinuance of peer feedback, including the quality and quantity of feedback received (Wu & Schunn, 2022; Zong et al., 2021). However, few studies have examined the relationship between the information characteristics of peer feedback and discontinuance behaviour. Related research on social media shows that information overload, in particular, is related to users' decisions to stop using a particular social network (Fu et al., 2020; Ma et al., 2022; Maier et al., 2015). To counter possible uneven or low-quality reviews, online peer feedback systems often involve multi-peer feedback, with reviews being received from 3 to 6 peers. Some students might find this to be an overwhelming amount of information. However, whether information overload of peer feedback is indeed a common source of stress for students and whether this stressor leads to discontinuance behaviour has not been explored.

The ZPD and the characteristics of peer feedback

Through peer review systems, students can receive timely feedback and acquire new knowledge based on the feedback received. Peer review activities for learning are usually limited to students who participate in the same course. As a result, the knowledge and ability of the peers providing feedback may often result in relatively familiar feedback content. This feedback familiarity can make the feedback more understandable (Rotsaert et al., 2018), and generally, peer feedback has been found to be useful for learning (Double et al., 2019; Li et al., 2020). Conceptually, the ZPD is defined as “the distance between the actual developmental level as determined by independent problem-solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with a more capable peer” (Vygotsky, 1978, p. 86). It can be taken as theoretically supporting feedback familiarity as an optimal zone for students (Zong & Schunn, 2025).

However, feedback familiarity may also pose several challenges to students' learning engagement. First, because peer feedback in a course typically focuses on a shared course task, the range of information received from peers can be limited to knowledge of curriculum tasks. Thus, the peer feedback may have relatively narrow information content, especially when it is mostly familiar content (Huang et al., 2020; Ma et al., 2022). In the context of peer review, information narrowing can be formally defined as homogeneity in information shared among students. It could be caused by students not accessing content from outside the course. Interactions limited to course knowledge can flatten the information students receive (Huang et al., 2020). However, narrowness within peer feedback may only be salient to those students who are especially aware of their learning experience (Bijami et al., 2013; Kuyyogsuy, 2019).

Secondly, when peers focus on familiar content, they can generate many comments. In isolation, abundant feedback is normally good; but when aggregated across multiple peers, the feedback recipient may experience information overload (Zhang et al., 2025). Information overload occurs when an individual is given more information than they can keep within working memory, and it often negatively affects task performance as well as producing anxiety (Bawden & Robinson, 2009). Furthermore, peer feedback may cause information overload because web-based peer feedback systems typically lack mechanisms for prioritising, organising or filtering received feedback.

In sum, we predicted that familiarity of peer feedback can have negative effects related to information narrowing and information overload, both of which are likely to be perceived negatively by students. However, there is no research to confirm how information familiarity affects information narrowing and information overload in peer review, and no research tests whether such reactions are related to students' future participation in peer feedback. We used Koeske and Koeske's (1993) SSO framework to make more specific predictions about how familiarity is related to outcomes.

The SSO framework and peer feedback

In Koeske and Koeske's (1993) widely used SSO framework, a stressor is an objective event that results in the psychological experience of strain, which in turn results in a psychological or behavioural response (Ayyagari et al., 2011). In other words, strain mediates the effect of stressors on behavioural outcomes (Koeske & Koeske, 1993). Among its many researched applications, the SSO framework has also been applied to recommender systems and social media to test the impact of information narrowing and information overload as stressors on participants (Ma et al., 2022; Salo et al., 2018). For example, the stressors of information overload and social overload during students' participation in social media-based learning generated the strains of technostrain (i.e., feeling overwhelmed by technology) and exhaustion, which subsequently had a negative impact on the outcome of students' academic performance (Shi et al., 2020; Whelan et al., 2020).

The SSO framework can provide a theoretical basis for explaining how information narrowing and information overload affect students' participation in peer review. Peer review systems enable information sharing among students. When peer feedback cannot meet the student's knowledge needs (e.g., through information narrowing) or exceeds their processing ability (i.e., information overload), students may become stressed, perhaps in the form of exhaustion. Here, exhaustion is defined as students' sense of fatigue, a negative psychological response to the stressors in the environment (Ma et al., 2022; Maier et al., 2015; Shi et al., 2020). Feeling exhaustion is likely to cause psychological reactance and a desire to discontinue the experience that is causing exhaustion (i.e., peer review). However, this relationship has not been tested.

Research model and hypotheses

The tested SSO framework applied to peer feedback is presented in Figure 1. The specific hypotheses being tested within the model are as follows.

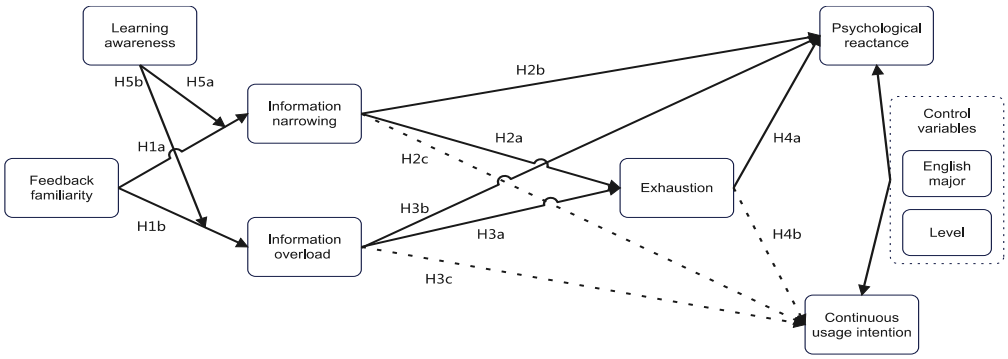

Figure 1. Research model based on the SSO framework.
Note. Positive relationships are shown with solid lines; negative relationships are shown with dotted lines.

Feedback familiarity and information-related stressors

Peer review requires students to focus their feedback on specific, class-related issues. Although the information from novices is often easy to understand, an advantage of peer review, the feedback from peers, by virtue of having similar classroom experiences and a guiding peer feedback rubric, may not be very diverse at times (Cho et al., 2006; Hanjani, 2019). Particularly when feedback is very familiar, the scope and diversity of feedback information may be narrow. Therefore, we proposed:

- H1a: Feedback familiarity is positively correlated with information narrowing.

Educators encourage students to provide comprehensive suggestions through training and through peer feedback comment prompts. This encouragement, when combined with multi-peer review, could lead to information overload (A. R. Lee et al., 2016; Zhang et al, 2025). Further, if reviewers choose to focus on

topics of high familiarity to the class, the many comments may be hard to keep mentally separate. Thus, we proposed:

- H1b: Feedback familiarity is positively related to information overload.

Strain and outcomes associated with information narrowing

The stressor of narrow feedback information could cause a psychological strain because students appear to prefer diverse feedback (L. Chen et al., 2013). In particular, receiving a lot of feedback from multiple peers that is perceived to be substantially redundant may lead to a feeling of exhaustion (Cao & Sun, 2018; Ma et al., 2022):

- H2a: Information narrowing is positively related to exhaustion.

In terms of outcomes, the narrowness of the received information might lead to negative reactance against the general process of peer feedback and a reduced desire to continue engaging in peer feedback:

- H2b: Information narrowing is positively related to psychological reactance.
- H2c: Information narrowing is negatively related to students' continuous usage intention.

Strain and outcomes associated with information overload

More generally, research on social networks has found that receiving a large amount of information consumes extensive user time and energy (Yu et al., 2018). Similarly, students often must spend a lot of time and effort to extract effective information from peer feedback: peer feedback information might contain opposing advice or incorrect information from multiple peers. A particularly common reaction to information overload is exhaustion (Alheneidi et al., 2021; Shi et al., 2020):

- H3a: Information overload is positively related to exhaustion.

Further, when information exceeds their processing ability, individuals generally tend to enter into a negative state (Fu et al., 2020; Guo et al., 2020):

- H3b: Information overload is positively related to psychological reactance.
- H3c: Information overload is negatively related to students' continuous usage intention.

Outcomes associated with the strain of exhaustion

The organisational behaviour research literature has generally found that exhaustion has a negative effect on the behaviour of organisational members (Fu et al., 2020; Swider & Zimmerman, 2010). Further, individuals spontaneously protect themselves against exhaustion and reduce negative effects when facing exhaustion (Alicke & Sedikides, 2009; Beaudry & Pinsonnault, 2005; Ma et al., 2022). For example, psychological reactance and discontinuance behaviour can be regarded as an individual's defense response to exhaustion (Kim & So, 2018). In the context of peer review, we proposed:

- H4a: Exhaustion is positively related to psychological reactance.
- H4b: Exhaustion is negatively related to students' continuous usage intention.

The moderating effect of learning awareness

In the peer review context, learning awareness refers to individuals' awareness about what knowledge they need to acquire through various sources, which could include peer feedback (Boud & Molloy, 2013; Reddy et al., 2021). Learning awareness shapes whether learners perceive the influence of various environmental factors on their own experiences and behaviours (Guo et al., 2020). In the context of the

current model, we expected that students with high learning awareness to be more sensitive to the negative effects of feedback familiarity:

- H5a: Students' learning awareness has a positive moderating effect on the relationship between feedback familiarity and information narrowing.
- H5b: Students' learning awareness has a positive moderating effect on the relationship between feedback familiarity and information overload.

Methods

Participants and course context

To obtain sufficient data for structural equation modelling, students from three courses that involved peer feedback using a common tool (Peerceptiv) were contacted by their course teachers for participation in the study. The courses consisted of an undergraduate English major course (n = 33), an undergraduate non-English major course (n = 35) and a graduate English major course (n = 57), all at a public research-oriented university in Northeast China. A total of 125 students completed the survey, but only 122 provided complete information (19 male, 103 female), with a valid response rate of 98%. Human ethics approval was obtained from the university's Human Research Protection Office before data collection. All participants provided informed consent before their interviews. Pseudonyms were used to ensure the confidentiality and anonymity of participants and their data.

Across all three courses, students experienced a shared peer feedback process. In terms of tasks, students had to (a) submit documents for course tasks; (b) provide comments and ratings on peers' documents using a structured form (see Figure 2) and (c) receive comments and ratings from peers on their own documents. In all three courses, writing and reviewing were part of the course assessment, and all students completed reviews for three peers' documents in each round of peer review.

The three courses varied in the complexity of the writing tasks being reviewed. The undergraduate English major course asked students to complete three rounds of writing and reviewing within 2 semesters. The writing tasks were 500-word argumentative essays, which were peer reviewed using a 7-dimensional rubric involving argument components, effectiveness of argumentation, coherence and cohesion, vocabulary and expressions, grammar, mechanics and plagiarism. In the non-English major course, students completed two rounds of writing and peer review within 2 semesters. The writing tasks involved short expository writing (a letter and a summary) of approximately 100–150 words. The reviewing rubric covered five dimensions: content, organisation, vocabulary, language use and mechanics. The graduate English major course involved one literature review writing task of 3,000 words completed within 1 semester. The reviewing rubric involved three dimensions connected to the contents of a literature review: Introduction, Body and Conclusion.

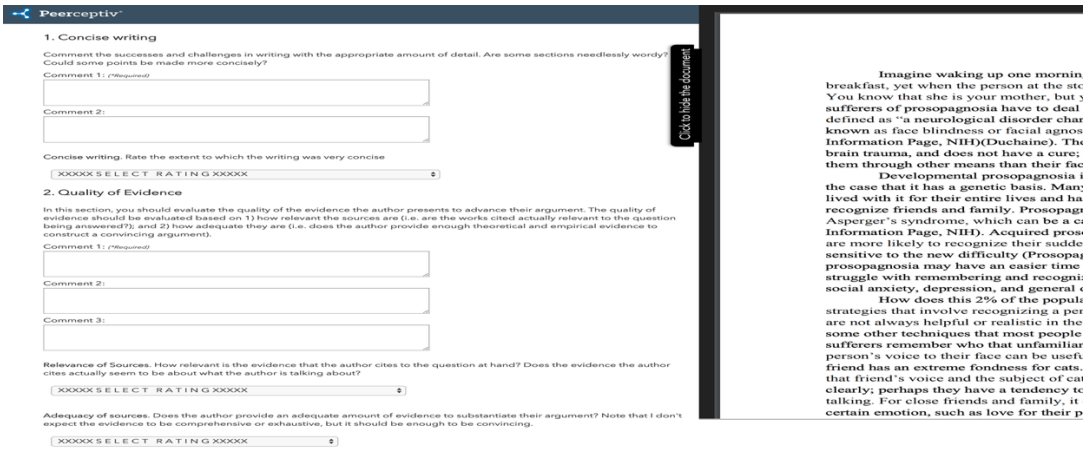

Figure 2. Reviewing interface in Peerceptiv at the time of the study

Measures

All seven constructs in the tested theoretical model (see Figure 1) were measured using surveys, each involving three or four Likert items rated on a 1 = strongly disagree to 7 = strongly agree scale. The survey items were adapted to the peer feedback context from surveys developed for other contexts (see Appendix A for original and adapted items). Table 1 presents the survey items and survey sources.

Table 1
Original source, item content and measurement properties for each of the seven constructs tested in the model

Construct	Source	Item content	Factor loading	α	CR	AVE
CUI	Bhattacherjee & Sanford (2006), Johnston & Warkentin (2010)	I intend to continue using peer review system for more of my study responsibilities.	.88	0.96	0.94	0.80
		I intend to continue using peer review system in the future courses.	.88			
		I predict I will continue using peer review system in future courses.	.93			
		I plan to continue using peer review system in future courses.	.88			
PR	Lowry & Moody (2015)	Feedback received from peers trigger a sense of resistance in me.	.65	0.83	0.82	0.60
		I would resist following feedback from peers.	.81			
		I would consider peer feedback to be an intrusion.	.85			
EX	Cao & Sun (2018)	I feel tired from the peer feedback function.	.70	0.88	0.76	0.52
		I feel drained from activities that require me to use peer feedback.	.81			
		Reviewing peer feedback is a strain for me.	.63			
IN	Huang et al. (2020)	The peer feedback content lessens information diversity.	.84	0.94	0.89	0.73
		The recommended content narrows my access to information.	.90			
		I have less and less contact with excluded information.	.82			
IO	A. R. Lee et al. (2016)	I am often distracted by the excessive amount of peer feedback information.	.76	0.73	0.81	0.60
		I find that I am overwhelmed by the amount of peer feedback.	.86			

Construct	Source	Item content	Factor loading	α	CR	AVE
		I feel having problems with too much peer feedback information to synthesise instead of not having enough information.	.68			
FF	Xing et al. (2014)	The information of peer feedback taking advantage of your existing information.	.89	0.77	0.77	0.55
		The information of peer feedback is near to your existing information rather than completely new information.	.79			
		The peer feedback is the type you have already possessed significant experience.	.46			
LA	M.-F. Chen (2009), Mai & Eisenberg (2012)	I am very self-conscious about my study.	.88	0.88	0.91	0.77
		I am constantly examining my learning conditions.	.86			
		I think that I take study matters into account a lot in my life.	.89			

Note. CR = composite reliability, CUI = continuous usage intention; EX = exhaustion; FF = feedback familiarity; IN = information narrowing; IO = information overload; PR = psychological reactance; LA = learning awareness.

Table 1 also shows measurement model characteristics. The Cronbach alphas and the composite reliabilities were all greater than the suggested threshold of 0.7, and average variance extracted (AVE) values were all greater than the suggested threshold of 0.5 (Fornell & Larcker, 1981). In addition to having good overall construct properties: most factor loadings (see Appendix B) were > 0.7 and always much higher than cross-loadings, indicating good construct reliability and convergent validity (Anderson & Gerbing, 1988), and the square roots of the AVE for each construct were generally greater than the linear correlations between constructs (see Table 2), indicating good discriminant validity (Straub et al., 2004).

Table 2
Mean and SD of values within each scale alongside discriminant validity information

	Mean	SD	CUI	PR	EX	IN	IO	LA	FF
CUI	4.43	1.31	**0.80**						
PR	4.33	1.93	-0.29***	**0.60**					
EX	2.60	1.14	-0.52***	0.56***	**0.52**				
IN	6.67	3.04	-0.45***	0.51	0.51***	**0.73**			
IO	6.33	3.16	-0.17	0.37	0.39	0.30***	**0.60**		
LA	4.72	1.26	0.26**	-0.15	-0.15	-0.24**	-0.15	**0.55**	
FF	3.56	1.16	0.43***	0.34***	0.30***	0.51***	0.37***	-0.18*	**0.77**

*p < .05. **p < .01. ***p < .001.
Note. Linear correlations between constructs (off-diagonal values in italics) and their statistical significance, and square roots of average variance extracted for each construct (diagonal values in bold).

Because the constructs had moderate intercorrelations and the overall number of participants in the study was not large, variance inflation factors were examined for potential multi-collinearity problems.

However, the variance inflation factors were all below the conservative threshold value of 2.0 (Petter et al., 2007). In addition, the first unrotated factor from an exploratory factor analysis explained only 36% of the covariance among the main constructs, which is smaller than the recommended cut-off of 40%. Thus, common method bias was not a serious concern in this study.

Procedure

All three groups of participants completed the questionnaires anonymously during class hours. To encourage participation, the questionnaires were delivered to the students by their English course teachers, who carefully introduced the purpose and significance of the questionnaire for research as well as the possible benefits for students' learning. As all classes were held online due to the COVID-19 pandemic, students marked choices on a digital copy of the survey and submitted them to their teachers. Questionnaire answers were then manually entered into Microsoft Excel for further analysis.

Results

We tested the proposed theoretical model using covariance-based structural equation modelling to minimise the discrepancy between empirical and model-implied variance–covariance matrices of the observable indicators (Fornell & Larcker, 1981). Specifically, AMOS version 26.0 was employed using a maximum likelihood function to obtain model parameter estimates (Byrne, 2001). Initially, the full theoretical model was tested. The model was then iteratively revised such that non-significant coefficients were eliminated. The final model (see Figure 3) generally provided a good fit to the data according to norms recommended by Klein (2005): $\chi 2$ /df = 1.88 < 2; normed fit index = .78 > .7; comparative fit index = .88 > .7; goodness-of-fit index = .76 > .7; and root mean square error of approximation = 0.08 $\leqslant$ 0.08.

In Figure 3, line thickness is proportional to connection strength, solid lines represent positive relationships, and dotted lines represent negative relationships. Specifically, supporting the first layer of the model (H1a and H1b), feedback familiarity was positively and strongly associated to both information narrowing (β = 0.41, p < 0.001) and information overload (β = 0.42, p < 0.01). The information narrowing effect was larger with higher levels of learning awareness (β = 0.31, p < 0.001), while there was no moderating effect of learning awareness on information overload, only supporting H5a.

Turning to the upper part of the second layer of the model, information narrowing was positively and strongly related with feelings of exhaustion (β = 0.47, p < 0.001), supporting H2a, and also positively related to psychological reactance (β = 0.25, p < 0.01), which supported H2b. Information narrowing was negatively related with continuous usage intention, albeit weakly (β = -.18, p < 0.05), supporting H2c. Thus, the effects of information narrowing were largely as expected, although with substantially different effect sizes.

Turning to the lower part of the second layer of the model, information overload was also positively related to the strain of exhaustion (β = 0.31, p < 0.001) and the outcome of psychological reactance (β = 0.27, p < 0.01), which supported H3a and H3b. There was no direct connection from information overload to the outcome of continuous usage intention, failing to support H3c.

As a mediator, the strain of exhaustion was positively associated with psychological reactance (β = 0.38, p < 0.001), supporting H4a, and negatively associated with continuous usage intention (β = -0.42, p < 0.001), supporting H4b. Since these strain-to-outcome effects were relatively large, the stressors of information narrowing and information overload can be considered as contributing to both outcomes of psychological reactance and reduced continuous usage intention predominantly via the strain of exhaustion, as predicted by the framework.

In terms of control variables, level and major were significantly related to continuous usage intention, but they had no significant statistical relationships with psychological reactance.

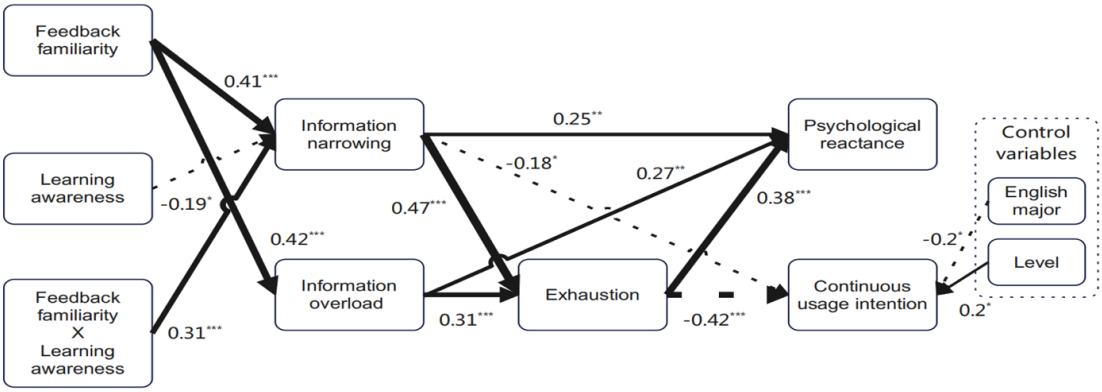

Figure 3. Results of the structural equation model, with line thickness proportional to connection strength

Note. *$p < 0.05$. **$p < 0.01$. ***$p < 0.001$. Positive relationship are shown with solid lines; Negative relationship are shown with dotted lines.

General discussion

Key findings and theoretical implications

The primary purpose of this study was to better understand feedback familiarity as a basis of students' negative responses to using computer-based peer review. Although some studies have explored students' negative attitudes towards peer feedback and which negative attitudes are associated with students' refusing to participate (Elizondo-Garcia et al., 2019; Liu & Carless, 2006; Mangelsdorf, 1992), research has not examined which kinds of experiences with peer feedback trigger negative reactions, and no research has used the SSO framework to model peer feedback situations. Results of this study show that the information characteristics of peer feedback itself (i.e., the familiarity of the feedback) can lead to negative student psychological reactions to peer feedback overall, beyond general behavioural responses (Zong et al., 2021) or specific reactions to specific pieces of feedback (Misiejuk et al., 2021).

This study was also the first to explore two particular stressors (information overload and information narrowing) and the strain of exhaustion for understanding these negative reactions. Overall, most of the proposed hypotheses were supported. As predicted, feedback familiarity was positively associated with information narrowing and information overload, each with relatively large effects. The observed relationships of feedback familiarity with information narrowing and information overload, novel in the context of peer review, are in line with studies in other e-learning and communications contexts (Huang et al., 2020; Ma et al., 2022). Similarly, the hypothesised connections of information overload and information narrowing on exhaustion were supported, replicating findings in other domains (Alheneidi et al., 2021; Cao & Sun, 2018; Ma et al., 2022; Shi et al., 2020).

As another novel contribution, the current study showed that learning awareness moderated the relationship between information familiarity and information narrowing, replicating findings in other domains (Guo et al., 2020). Conceptually, the positive moderation of this relationship, coupled with the lack of a similar moderation of the informational overload relationships, suggests that the connection between feedback familiarity and information narrowing is a more subtle effect than the information overload effect. Note that awareness of information narrowing itself is not driven by learning awareness; it is the relationship of feedback familiarity to information narrowing that was moderated.

Furthermore, the model showed that the negative outcomes of information narrowing and information overload were largely (but not fully) mediated by feelings of exhaustion, again providing support for the proposed SSO framework. Additionally, the study suggests that exhaustion is a major factor underlying psychological reactance and continuous usage intention, replicating findings from organisational behaviour research (Fu et al., 2020; Kim & So, 2018), now shown to hold in a very different domain.

Implications for practice

This study provides insights for educators and developers of peer review computer-based platforms. The apparent negative effect of feedback familiarity could be addressed through a number of revisions to system design or classroom implementation. First, there is the way in which reviewers are allocated to peer documents to increase heterogeneity among students. Research on allocating students has focused on matching students by ability (e.g., Zong & Schunn, 2025). First, system developers could create reviewer assignment algorithms that increase reviewer diversity, rather than always matching students by ability or randomly assigning reviewers to documents. Second, there is the choice of the commenting prompts. Instructors could learn about which dimensions are most in need of feedback, through examining performance or surveying students, and then focus the commenting prompts on those more novel areas. Third, there are automatic summarising tools (Sharma & Sharma, 2022) that could filter the produced peer feedback to remove feedback that is likely to be highly familiar or previously said by another peer.

Another direction for system developers and educators to consider is strategies for reducing feelings of information overload. The total amount of feedback a student receives from peers involves the multiplication of the number of feedback providers and the depth of commenting expected from each provider (e.g., with many separate comment prompts). Educators should avoid situations that produce many reviews and extensive comments from each provider (e.g., by asking providers to comment on many issues rather than to focus on the most important issues). System designers could create natural language processing tools that could automatically summarise and filter feedback (Shaik et al., 2022). Alternatively, only comments from the most accurate raters could be shown. Educators could also provide students with some training on how to efficiently read reviews to reduce feelings of overload or exhaustion.

Finally, the study suggests that platform designers and educators should consider better supporting students' learning awareness because it reduces feelings of information narrowing. This might involve including self-reflection prompts as part of the overall assignment (Nilson & Zimmerman, 2023) or as part of a learning diary (Lew & Schmidt, 2011).

Limitations

Although our findings have revealed several important insights, several limitations must be noted. Firstly, this study was conducted in only one university in China, and all investigated students came from English courses. In different cultural backgrounds and different professional courses, students may have different reactions to peer feedback. Secondly, this study used one computer-based peer review platform. Participants' experiences and reactions to the assignment algorithm may differ across different peer review platforms that might organise received information differently or shape providers' contributions using other scaffolding mechanisms. Therefore, additional validation work is needed in different settings, and the generalisation of research findings to other contexts should be made with caution. Thirdly, we only examined one strain mediator variable, namely perceived exhaustion. The lack of full mediation suggests that there may be other strains that act as mediators (e.g., anxiety and anger), which should be further explored in future research. Fourthly, this study examined correlations among self-reported feelings and behavioural intentions. Future research should use experiments to test the causality of the observed relationships. Further, future research should consider measuring students' actual behaviour.

Conclusion

This study attempted to extend our knowledge of students' negative responses to peer feedback through peer review platforms. Our findings confirm that information-related stressors in peer feedback are positively related to students' exhaustion, which in turn leads to students' negative psychological and behavioural responses. These results provide new perspectives into students' responses to peer feedback and offer educators new approaches to improving outcomes.

Author contributions

Zheng Zong: Conceptualisation, Investigation, Writing – original draft, Writing – review and editing; **Christian Dieter Schunn**: Data curation, Investigation, Formal analysis, Writing – review and editing; **Meihui Zhang**: Writing – review and editing; **Ying Gao**: Data collection, Writing – review and editing. All authors reviewed and approved the final version of the manuscript.

Data availability statement

All data, models or code generated or used during the study are available from the corresponding author by request.

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Appendix A

Source of survey items, original item and how it was adapted for the current study

Continuous usage intention : CUI (Bhattacherjee & Sanford, 2006; Johnston & Warkentin, 2010)		
CUI1	Original Item	I intend to use DMS for more of my job responsibilities.
	Adapted Item	I intend to continue using peer review system for more of my study responsibilities.
CUI2	Original Item	I intend to use anti-spyware software in the next three months
	Adapted Item	I intend to continue using peer review system in future courses.
CUI3	Original Item	I predict I will use the anti-spyware software in the next three months.
	Adapted Item	I predict I will continue using peer review system in future courses.
CUI4	Original Item	I plan to use the anti-spyware software in the next three months.
	Adapted Item	I plan to continue using peer review system in future courses.
Psychology reactance: PR (Lowry & Moody, 2015)		
PR1	Original Item	Recommendation algorithm would trigger a sense of resistance in me.
	Adapted Item	Feedback received from peers trigger a sense of resistance in me.
PR2	Original Item	I would resist it.
	Adapted Item	I would resist following the feedback from peers.
PR3	Original Item	I would consider it to be an intrusion.
	Adapted Item	I would consider peer feedback to be an intrusion.
Exhaustion: EX (Cao & Sun, 2018		
EX1)	Original Item	I feel drained from activities that require me to use recommendation algorithm.
	Adapted Item	I feel drained from activities that require me to use peer feedback.
EX2	Original Item	I feel tired from the recommendation function.
	Adapted Item	I feel tired from the peer feedback function.
Ex3	Original Item	Using recommendation algorithm is a strain for me.
	Adapted Item	Reviewing peer feedback is a strain for me.
Information narrowing: IN (Huang et al., 2020)		
IN1	Original Item	The recommended content lessens information diversity.
	Adapted Item	The peer feedback content lessens information diversity.
IN2	Original Item	The recommended content narrows my access to information.
	Adapted Item	The peer feedback content narrows my access to information.
IN3	Original Item	I have less and less contact with excluded information.
	Adapted Item	I have less and less contact with excluded information.
Information overload: IO (A. R. Lee et al., 2016)		
IO1	Original Item	I am often distracted by the excessive amount of recommended information.
	Adapted Item	I am often distracted by the excessive amount of peer feedback information.

IO2	Original Item	I find that I am overwhelmed by the amount of recommended information.
	Adapted Item	I find that I am overwhelmed by the amount of peer feedback.
IO3	Original Item	I feel having problems with too much recommended information to synthesize instead of not having enough information.
	Adapted Item	The challenge lies not in receiving too little peer feedback, but in synthesizing an excessive amount of it.
Feedback familiarity: FF (Xing et al., 2014)		
FF1	Original Item	The platform recommends information taking advantage of your existing consuming information.
	Adapted Item	Much of the peer feedback simply restates the content of your work.
FF2	Original Item	The platform recommends information near to your existing consuming information rather than completely new information.
	Adapted Item	Such feedback tends to align closely with what you already know, rather than introducing entirely new perspectives.
FF3	Original Item	The platform recommends information the type you have already possess significant experience.
	Adapted Item	Feedback is the type of knowledge you already have extensive experience with.
Learning awareness: LA (M.-F. Chen, 2009; Mai & Eisenberg, 2012)		
LA1	Original Item	I am very self-conscious about my health.
	Adapted Item	I am very self-conscious about my study.
LA2	Original Item	I am constantly examining my health conditions.
	Adapted Item	I am constantly examining my learning conditions.
LA3	Original Item	I think that I take health matters into account a lot in my life.
	Adapted Item	I think that I take study matters into account a lot in my life.

Appendix B

Item loadings from the exploratory factor analysis. Expecting loadings in gray cells; strong loadings (>.6) in bold; loadings below .4 are suppressed.

	PR	EX	IN	IO	FF	CUI	LA
PR1: Feedback received from peers trigger a sense of resistance in me	**0.65**		0.42				
PR2: I would resist following the feedback from peers.	**0.81**						
PR3: I would consider peer feedback to be an intrusion.	**0.85**						
EX1: I feel tired from the peer feedback function.	0.43	**0.70**					
EX2: I feel drained from activities that require me to use peer feedback.		**0.81**					
EX3: Reviewing peer feedback is a strain for me.		**0.63**					
IN1: The peer feedback content lessens information diversity.			**0.84**				
IN2: The recommended content narrows my access to information.			**0.90**				
IN3: I have less and less contact with excluded information.			**0.82**				
IO1: I am often distracted by the excessive amount of peer feedback information.				**0.76**			
IO2: I find that I am overwhelmed by the amount of peer feedback.				**0.86**			
IO3: The challenge lies not in receiving too little peer feedback, but in synthesising an excessive amount of it.				**0.68**			
FF1: Much of the peer feedback simply restates the content of your work.					**0.89**		
FF2: Such feedback tends to align closely with what you already know, rather than introducing entirely new perspectives.					**0.79**		
FF3: Feedback is the type of knowledge you already have extensive experience with.					0.47		
CUI1: I intend to continue using peer review system for more of my study responsibilities.						**0.89**	
CUI2: I intend to continue using peer review system in future courses.						**0.88**	
CUI3: I predict I will continue using peer review system in future courses.						**0.93**	
CUI4: I plan to continue using peer review system in future courses.						**0.88**	
LA1: I am very self-conscious about my study.							**0.89**
LA2: I am constantly examining my learning conditions.							**0.87**
LA3: I think that I take study matters into account a lot in my life.							**0.89**