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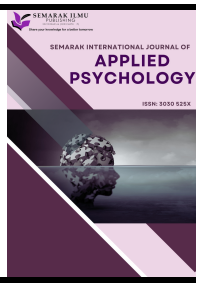

The Moderating Role of User Experience on Expectancy Disconfirmation in Airport-Rail Disruption

Mohd Haniff Osman[1,2,*], Muhamad Nazri Borhan[1], Nur Arzilah Ismail[2]

[1] Smart and Sustainable Township Research Centre, Faculty of Engineering and Built Environment, National University of Malaysia, 43600 UKM Bangi, Selangor, Malaysia
[2] Applied and Computational Engineering Mathematics, Department of Engineering Education, Faculty of Engineering and Built Environment, National University of Malaysia, 43600 UKM Bangi, Selangor, Malaysia

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ABSTRACT

Managing unexpected service disruptions on the Airport-Rail Link (ARL) is especially challenging for the operator when dealing with the expectations of new (potential) users. These individuals may develop unrealistic expectations regarding response actions, influenced by social amplification and a lack of contextual understanding. To manage reputational risk, ARL operators must consistently monitor and address the recovery disconfirmation (the gap between user expectations and their perceptions of the operator's response to disruptions). A key challenge is understanding how this disconfirmation differs between potential and existing users. Existing research on service recovery often treats users homogenously or focuses primarily on existing users, leaving a gap in understanding how prior experience influences the disconfirmation process. Therefore, this study investigates user experience as a moderating factor (a variable influencing the strength of a relationship) between expectation and perceived performance within the Expectancy Disconfirmation Model, viewed through the lens of justice theory (which assesses the fairness of outcomes, processes and interactions). To overcome the limitations of text-based scenarios for potential users, a comic-based questionnaire was employed to visually represent hypothetical response actions. Data collected from 557 train passengers, including 267 potential users, were analysed using PLS-SEM with SmartPLS software that performs a two-stage approach for moderation analysis. The findings indicate that user experience significantly moderates the relationship between expectations and perceived performance. Potential users' expectations exert a stronger influence on their judgments of response actions, while existing users are more pragmatic. These results suggest that ARL operators should tailor response actions to better align expectations and performance perceptions for both user groups.

* *Corresponding author.*
E-mail address: haniff68@ukm.edu.my

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1. Introduction

Airport–rail link (ARL) services provide air travellers with a convenient alternative to road transport when travelling to (and from) the airport. The services enable travellers to skip traffic congestion while enjoying affordable fares and quick access to airport terminals [1]. Despite their convenience, ARL is vulnerable to unexpected service disruptions due to extreme weather, vandalism, strikes or accidental damage to infrastructure [2,3]. In such situations, the service operator's response action is critical. Effective communication and appropriate compensation can mitigate negative disconfirmation, whereas inadequate responses may intensify user dissatisfaction. Specifically, insufficient transparency and communication during disruptions can further exacerbate negative perceptions [4]. Affected users may also feel disregarded or undervalued if the service provider fails to act promptly or does not provide an adequate explanation [5]. Such negative perceptions could erode trust in the service provider and diminish customer loyalty [6].

The Expectancy Disconfirmation Model (EDM) evaluates the cognitive gap between expectations and perceived performance during service disruptions in various sectors [7-9]. According to EDM, positive disconfirmation occurs when the response action exceeds expectations, resulting in satisfaction. However, if it falls short, negative disconfirmation leads to dissatisfaction. During stressful events like service disruptions, users' reactions are heavily influenced not just by what response occurs relative to expectations, but by how fair they perceive that response [10]. Justice theory provides a normative basis to evaluate this perceived fairness, which it breaks down into three dimensions: distributive justice, procedural justice and interactional justice. With regard to service disruptions, McCollough *et al.,* [9] described distributive justice as the perceived fairness of the outcomes or compensations received; procedural justice relates to the fairness and transparency of the processes used to manage the disruption; and interactional justice focuses on the quality of interpersonal treatment, including respect, empathy and clarity in communication throughout the response process. Incorporating justice theory into EDM enables us to evaluate both expectations and perceived performance regarding response actions through the perspective of fairness.

According to Hjortskov [11], the formation of expectations differs among individuals. In the context of service disruption, existing users generally possess a frame of reference for the operator's response action, resulting in more realistic expectations [11,12]. Their confidence, shaped by prior experiences, enables them to make informed assessments of response actions and more precise cognitive judgments. In contrast, potential users (aware non-users) may develop unrealistic expectations, often shaped by social influences and limited context [12,13]. These cognitive differences mean that the link between expectations and perceived performance may differ significantly between the two user groups when both are facing a disruptive event and presented with the same response actions. However, current research on service recovery often treats users homogeneously or focuses primarily on existing users, leaving a gap in understanding how prior user experience specifically alters the disconfirmation process, particularly within the integrated framework of EDM and justice theory.

Accordingly, it is essential to examine how user experience influences the disconfirmation process during ARL disruptions. The objectives of this study are to (i) evaluate the EDM within the context of unexpected ARL service disruptions, viewed through the lens of justice theory, (ii) investigate the moderating role of user experience in the relationship between expectation and perceived performance during the service disruptions, and (iii) offer practical implications and guidance for ARL operators on tailoring their response strategies to effectively meet the distinct needs of both existing and potential users.

2. Methodology

This section explains the study's methodology. It first describes the research model. Next, it outlines the development of the comic-based questionnaire. Then, it presents procedures for data collection. Finally, it discusses how Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed for data analysis.

2.1 Research Model

While EDM provides a cognitive framework for assessing the extent to which response actions align with user expectations, justice theory complements it by introducing the crucial dimension of perceived fairness [14]. Justice theory encompasses three dimensions: distributive justice, procedural justice and interactional justice. Distributive justice pertains to the fairness of outcomes or compensation provided to users following service failures. Procedural justice relates to the fairness of the processes or policies implemented by the service provider to manage disruptions. Interactional justice concerns the fairness of interpersonal treatment received by individuals during recovery interactions, with an emphasis on respect, empathy and dignity. Figure 1 illustrates the relationship between the core constructs of EDM, viewed through the lens of justice theory. The descriptions of the constructs are outlined below:

i. Justice-Based Expectations (EXP): This construct represents a user's expectations about what constitutes a fair and just response from a service provider during an unexpected service disruption.
ii. Perceived Justice of Response Action (PCV): This construct measures how users assess the fairness and appropriateness of the operator's response actions as depicted in the comic strip scenario.
iii. Disconfirmation of Response Action (DSC): This construct represents the extent to which the perceived performance (PCV) deviates from what users initially expected (EXP). It indicates whether the operator's response actions were better, worse or about the same as expected during the disruption.

To empirically assess how expectations influence perceived performance and the subsequent disconfirmation in response actions for two user groups, this study deconstructed the disconfirmation paradigm into a series of testable relationships. To test these relationships, which are hypothesised based on the expectation disconfirmation theory, the following hypotheses were established:

i. **H1**: Expectation (EXP) has a significant effect on disconfirmation (DSC);
ii. **H2**: Perceived performance (PCV) has a significant positive effect on disconfirmation (DSC);
iii. **H3**: Expectation (EXP) has a significant positive effect on performance perception (PCV);
iv. **H4**: Perceived performance (PCV) significantly mediates the relationship between the expectation (EXP) and disconfirmation (DSC).

A primary goal of this study is to determine whether expectations leading to perceived performance differ between ARL's existing and potential users. As a result, user experience was

added as a moderating variable. This is expected to strengthen the relationship between EXP and PCV, leading to the following hypothesis:

v. **H5**: User experience moderates the relationship between EXP and PCV.

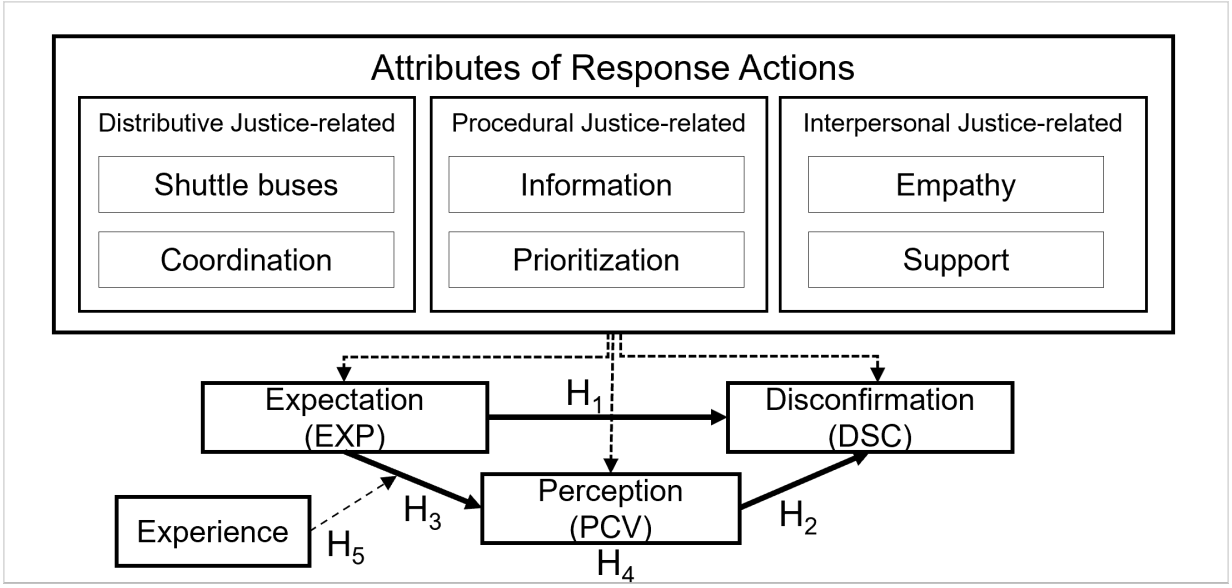

Fig. 1. The expectancy disconfirmation model incorporates attributes of response actions based on justice theory

2.2 Instrument Development: The Comic-Based Questionnaire

The use of hypothetical scenarios is consistent with the Stated Preference (SP) approach, which assesses how individuals value transportation scenarios [15]. Traditional SP applications have often relied on text-heavy questionnaires, which may inadequately represent complex situations and increase the risk of misinterpretation, thereby reducing realism [16]. To address these limitations, researchers have proposed using visual graphics in surveys [17,18]. Visual narratives can enhance understanding of public perceptions, resonate with respondents' prior experiences and maintain engagement [19]. Additionally, respondents can process the information at their own pace [20].

To mitigate the known issues with traditional text-based questionnaire, this study introduced a comic strip questionnaire to enhance data quality for this specific disruption event. By using a comic strip, the questionnaire provides a richer, sequential visualization of the scenario, character interactions and environmental context, thereby enhancing comprehension and perceived realism. This approach is anticipated to yield responses that more accurately reflect perceptions of the intended situation, thereby strengthening construct validity. Additionally, the comic strip increases engagement and enables respondents to process information visually and at their own pace, which may result in more thoughtful and consistent responses.

The comic strip questionnaire design followed a model from Salomon *et al.,* [19]. This model links three elements: transportation issues, people and information flow. In this study, the 'transportation issue' refers to an unexpected ARL service disruption, 'information flow' denotes the response actions implemented by the ARL operator and 'people' represent both existing and potential ARL users. Figure 2 presents the six pages of the comic strip used in the questionnaire.

Fig. 2. A six-page comic strip visualising the ARL operator's response sequence in the event of a service disruption

2.2.1 Sequence of events

The comic strip developed for this study presents a narrative scenario featuring a solo traveller, Peter, who is using ARL service for the first time. During regular train operating hours, Peter is scheduled to arrive at the airport with a 90-minute buffer before his flight's boarding time [21]. Peter's initial excitement shifts to anxiety when the 'Holding Message' announces potential service suspensions due to a flash flood. His first attempt to seek clarification from an information desk staff member proves unhelpful, resulting in a lack of clear information and increased stress. Subsequently, the 'Core Message' confirms the suspension of all train services.

The narrative subsequently illustrates the ARL operator's response actions. The sequence of the actions unfolds as follows:

i. Another staff member acknowledged Peter's frustration empathetically. The staff member proactively provided Peter with a printed initial statement containing information about the service disruption.

ii. The staff member also gave Peter a $10 meal voucher as a goodwill gesture. In addition, Peter received information about shuttle buses, including departure times and how they are coordinated with airport and traffic authorities. All affected passengers, including Peter, were kept informed about when the first bus will leave.
iii. Peter boarded the shuttle bus but felt more anxious because of traffic and bad weather. The staff's professionalism and clear communication help reassured him. Despite the delay, Peter arrived at the airport and boarded his flight. Through this experience, he sees how well the operator manages disruptions.

2.2.2 Comic strip generation

Incorporating a narrative comic strip into the questionnaire is intended to enhance participants' comprehension of the disruption scenario. Achieving this objective requires the application of key design principles, such as carefully selecting scenarios, effectively utilizing visual storytelling elements and accurately representing operator responses during service disruptions.

Agency reports were consulted to construct a narrative detailing the events, involved characters including timing of response actions during a service disruption [21,22]. A hybrid workflow combining artificial intelligence (AI) and a human illustrator was used to depict the narrative and accurately represent the scenario environment visually. Three AI-powered applications such as StoryNest, Dashtoon and StoryboardThat, were used to generate graphic and textual content from text prompts, enabling rapid visualisation of multiple scenes of train service disruption. However, some parts of these preliminary contents were lacking in emotional depth and contextual accuracy. Therefore, the human illustrator refined the AI-generated content by adding emotional depth, verifying contextual accuracy and incorporating character expressions consistent with the narrative.

2.2.3 Measurement items

Questionnaire items measuring justice-based EDM constructs were strategically linked to specific points within the comic strip narrative. This approach was designed to sequentially and contextually capture expectations, perceptions and disconfirmation, with all items formulated according to justice theory. Each item utilized a five-point Likert scale, ranging from 'Strongly Disagree' to 'Strongly Agree,' with the midpoint labelled as either 'Neutral' or 'Okay,' depending on the context. Table 1 lists the questionnaire items, which were adapted from recovery service literature to ensure validity [9,23,24].

Panels pretested the comic-based questionnaire to ensure that EDM constructs and their measurement items were interpreted as intended. Following the pretest, a pilot study was conducted involving 30 randomly selected train passengers to estimate the time required to complete the questionnaire.

Table 1
Measurement items used for three latent constructs in the justice-based expectancy disconfirmation model

Dimension	Construct	Code	Statement on the questionnaire (Item)
Distributive	Expectation	Exp1	The train company should arrange shuttle bus services to the airport.
		Exp2	I want the train company to coordinate with traffic authorities to prioritize shuttle bus routes and minimize delays.
	Performance Perception	Pcv1	The train company made every effort to arrange shuttle buses for passengers to reach the airport.
		Pcv2	The train company's coordination with traffic authorities led to a remarkably smooth shuttle bus experience.
	Disconfirmation	Dsc1	The train company went beyond my expectations in arranging shuttle buses to the airport.
Procedural	Expectation	Exp3	I want to receive timely updates on the arrival times of shuttle buses to the airport.
		Exp4	Passengers with urgent flight schedules should be prioritized in shuttle bus arrangements.
	Performance Perception	Pcv3	Information about shuttle bus arrivals was communicated regularly.
		Pcv4	Passengers with imminent flight departures were given priority by the train company.
	Disconfirmation	Dsc2	I was impressed by how effectively the train company used various channels to communicate information about shuttle bus arrivals.
Interactional	Expectation	Exp5	I want the train company to demonstrate empathy and understanding towards the frustrations and concerns of passengers.
		Exp6	I want the train company to offer prompt and effective support to passengers affected by disruptions.
	Performance Perception	Pcv5	I felt that the staff genuinely cared about passengers' need to reach the airport and not miss their flight.
		Pcv6	The train company's support was timely and resolved immediate issues.
	Disconfirmation	Dsc3	The staff's empathy and understanding were even greater than I expected.

2.3 Data Collection and Analysis

Small, coupon-sized cards featuring QR codes that linked to a comic-based questionnaire were randomly distributed to train passengers at the entrances of interchange stations in Kuala Lumpur. This distribution method was chosen to ensure that recipients did not feel pressured to complete the questionnaire on the spot, as many passengers are often in a hurry. By allowing them to access the questionnaire at their convenience, the aim was to encourage more thoughtful responses and reduce the chances of receiving superficial answers. At the end of the questionnaire, recipients were also asked to indicate whether they had previously used a train to reach the airport.

Data collected were analysed using PLS-SEM with SmartPLS software. Specifically, moderation analysis by PLS-SEM implementation follows a two-stage approach [25], proposed by Chin *et al*., [26]. The two-stage approach involves a sequential process to estimate the moderating effect of an interaction term (*Experience* X *EXP*) in a PLS path model. The path coefficient (and its significance) from the interaction term to the dependent variable (PCV) indicates the presence and strength the moderating effect.

3. Result

Of the 650 invitation cards distributed, 557 individuals participated in the study, resulting in a participation rate of 86%. Among these, only 267 individuals (about 40%) had no prior experience with ARL services. The power analysis indicates that 90 participants are needed to achieve 80% statistical power at a 5% significance level for detecting R^2 values of 0.10. Therefore, since the number of respondents exceeds the minimum required sample size, the structural model (as depicted in Figure 1) has adequate power to detect even small effects, ensuring the reliability of the statistical results.

Prior to moderation analysis, the validity and reliability of measurement models for the justice-based EDM depicted in Figure 3 were evaluated, followed by assessment of the structural model. All statistical thresholds for evaluating the PLS-SEM results were adopted from the guidelines provided by Hair *et al.,* [27]. Cronbach's alpha and composite reliability (CR) values for the EXP, PCV and DSC constructs, as shown in Table 2, exceeded the 0.70 threshold, indicating high internal consistency. Specifically, DSC had a CR of 0.794, EXP had a CR of 0.835, and PCV had a CR of 0.878. All three model constructs demonstrated strong convergent validity, with Average Variance Extracted (AVE) values above the 0.50 threshold. DSC had an AVE of 0.706, EXP had an AVE of 0.549 and PCV had an AVE of 0.621. Additionally, the outer loadings for all indicators, as presented in Table 2, ranged from 0.626 to 0.892, surpassing the generally accepted threshold of 0.70 for most indicators.

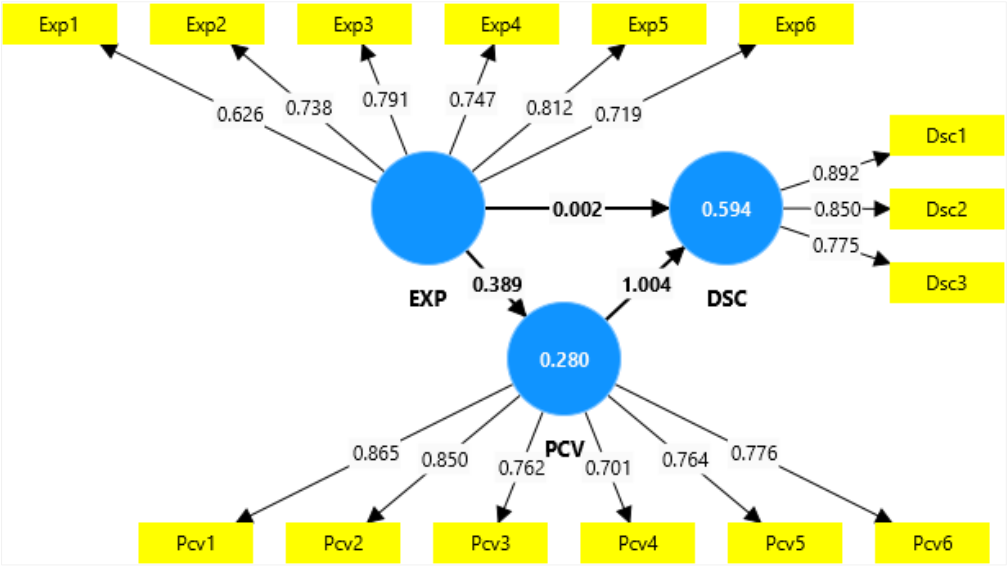

Fig. 3. PLS-SEM results including outer loadings of all indicators, f^2 effect sizes depicted on arrows between constructs, and R^2 values for the endogenous constructs

Table 2
Reflective measurement model results

Construct	Outer loadings range	CR	CR	AVE
DSC	0.775-0.892	0.794	0.878	0.706
EXP	0.626-0.812	0.835	0.879	0.549
PCV	0.701-0.865	0.878	0.907	0.621

Discriminant validity was established using the Fornell-Larcker criterion and HTMT ratios. The square root of the AVE for each construct (the diagonal values) exceeded its highest correlation with

any other construct, as shown in Table 3. All HTMT ratios in Table 4 were below the 0.90 threshold, with the highest value being 0.889 between PCV and DSC, confirming adequate discriminant validity.

Table 3
Discriminant validity by Fornell-Larcker criterion

Construct	DSC	EXP	PCV
DSC	0.841		
EXP	0.431	0.741	
PCV	0.770	0.529	0.788

Table 4
HTMT ratio results

Construct	DSC	EXP
DSC	0.504	
EXP	0.889	0.594

The structural model was subsequently evaluated using VIF, R^2 and Q^2 values. Table 5 shows that all VIF values for the structural model were below the conservative threshold of 3.0, indicating the absence of multicollinearity issues. The model accounted for a substantial proportion of variance in the endogenous variables, with R^2 values of 0.280 for PCV and 0.594 for DSC. Q^2 values were 0.168 for PCV and 0.394 for DSC, both of which were above zero, indicating strong predictive relevance. The f^2 was examined to determine the effect size of the independent variables (EXP, PCV) in predicting the endogenous variables (PCV, DSC). Figure 3 indicates a large effect size ($f^2 \geq 0.35$) as defined by Cohen [28] for both the influence of EXP on PCV and the influence of PCV on DSC. Conversely, the direct effect of EXP on DSC was negligible ($f^2 < 0.02$), confirming its lack of statistical significance.

Table 5
Endogenous variable VIF, R^2 and Q^2

Endogenous variable	VIF	R^2	Q^2
PCV	1.000	0.280	0.168
DSC	1.389	0.594	0.394

The results of path analysis, presented in Table 6, were obtained using a bootstrapping procedure with 5000 resamples to test the hypotheses. At a 5% significance level, a hypothesis is supported when the *t*-value exceeds 1.96 and the *p*-value is less than 0.05. The direct path from EXP to DSC was not significant (path coefficient, β = 0.032, *t*-value = 0.406, *p*-value = 0.685), indicating that H1 is not supported. Meanwhile, the path from EXP to PCV was significant (β = 0.529, *t*-value = 7.246, *p*-value < 0.001), supporting H2 and indicating that expectations have a significant positive influence on perceived performance of response actions. The path from PCV to DSC was also significant (β = 0.753, *t*-value = 11.723, *p*-value < 0.001). This supports H3, confirming that perceived performance of response actions significantly influences disconfirmation.

Table 6
Statistical hypothesis test

Path	β	*t*-value	*p*-value	Decision
EXP->DSC	0.032	0.406	0.685	Not support H1
EXP->PCV	0.529	7.246	0.000	Support H2
PCV->DSC	0.753	11.723	0.000	Support H3

The direct path from EXP to DSC was statistically non-significant, failing to support H1. However, a significant indirect effect was identified. As shown in Table 7, PCV significantly mediates the relationship between EXP and DSC. The indirect effect coefficient is 0.399 (with a *t*-value of 5.475) which is statistically significant (*p*-value < 0.05) and supported by a 95% confidence interval that does not include zero [0.268, 0.553]. Therefore, H4 is supported.

Table 7
Significance analysis of the indirect effect EXP on DSC through PCV

Path	Indirect effect	95% CI of the Indirect Effect	*t*-value	Significance (*p*-value < 0.05)?
EXP->PCV->DSC	0.399	[0.268, 0.553]	5.475	Yes

Before including the interaction term (Experience x EXP), the R^2 for PCV was 0.28, indicating that the baseline model accounted for 28% of the variance in the construct, primarily explained by EXP. After including the interaction term, the R^2 increased to 31.7% (as shown in the PCV construct in Figure 3), representing a 3.7% increase in explained variance. The significance of the moderating effect was subsequently analysed. Results in Figure 4 indicate a statistically significant moderating effect of user experience on the relationship between EXP and PCV (β = 0.393, *t*-value = 2.438, *p*-value < 0.05). This finding supports H5, confirming that the level of experience moderates the relationship between expectations and perceived performance. The f^2 effect size for this moderation was 0.048, which is considered small according to Cohen's guidelines but remains meaningful in practical terms.

To further interpret the significant moderating effect, a simple slope analysis was conducted and is presented in Figure 5. The relationship between EXP and PCV differs significantly between existing and potential users. For potential users, the positive relationship between expectations and perceived performance is stronger, as indicated by the steeper slope of the green line. For existing users, the positive relationship between EXP and PCV is present, but the slope of the red line is less steep.

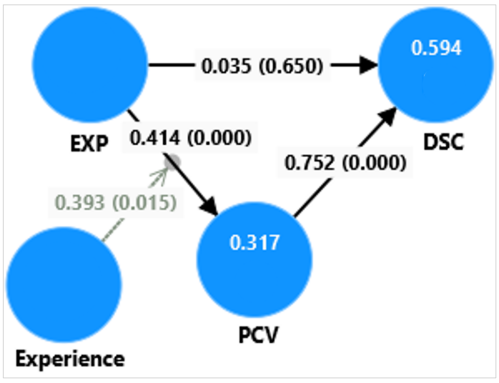

Fig. 4. Results of a structural model including the interaction term "Experience X EXP". Path coefficients are indicated on the arrows along with their *p*-values in brackets

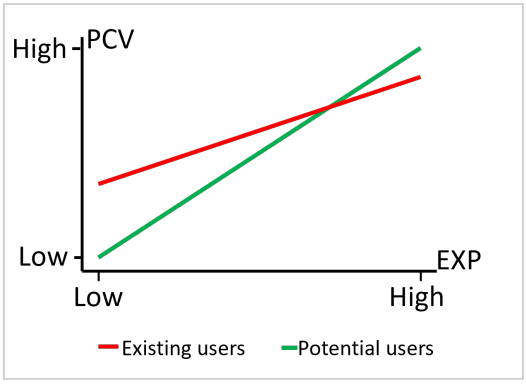

Fig. 5. Simple slop plot using PLS-SEM

4. Discussion

This study evaluated the justice-based EDM in the context of ARL service disruptions, with a focus on the moderating role of user experience. The findings provide key insights into how both potential and existing users assess response actions during simulated disruption scenarios.

The PLS analysis confirmed that EXP significantly influences PCV ($\beta = 0.529$, $f^2 = 0.389$) and that PCV in turn has a powerful influence on DSC ($\beta = 0.753$ p-value < 0.001, $f^2 = 1.004$). This supports the core tenets of EDM, where perceived performance plays a central role in shaping disconfirmation [9].

The direct path from EXP to DSC was not significant, indicating that expectations alone do not directly translate into disconfirmation. This finding contradicts previous studies in the context of service disruptions [7,14,24] that identified a direct effect of expectation on disconfirmation. This discrepancy is likely attributable to the composition of the study's respondents. The present study includes individuals with and without prior experience, whereas previous studies surveyed only users with direct, personal experience of a service disruption/failure. Furthermore, the influence of initial expectations is fully mediated by performance perceptions ($\beta = 0.399$, t-value=5.745, p-value< 0.05). This finding underscores that fairness perceptions are not merely an outcome but a central mechanism through which users translate their initial expectations into judgments about the adequacy of a disruption response. It refines the integration of justice theory with EDM by empirically positioning perceived justice as the critical lens through which the disconfirmation is ultimately evaluated during service disruptions.

A key contribution of this study is the confirmation that user experience moderates the relationship between expectations and perceived performance ($\beta = 0.392$, p-value = 0.015, $f^2 = 0.048$). Simple slope analysis supports this finding by revealing two distinct patterns. For users without prior experience, the relationship between EXP and PCV is stronger, as indicated by a steeper slope. This suggests that potential users, lacking structural experience, are more likely to align their performance perceptions with their expectations. This alignment may reflect a mechanism of cognitive consistency, where initial optimistic expectations are confirmed by perceiving actions in a positive light. In contrast, for existing users, the relationship is less pronounced, indicating that prior experiences serve as a critical reference point. The perceived justice of the response action is less influenced by initial expectations, suggesting that existing users evaluate performance against a more realistic baseline. Although the slope differs between the two user groups, both exhibit positive slopes, which are consistent with an assimilation effect. This introduces a critical boundary condition to the EDM, indicating that in situations characterized by uncertainty and potential stress, such as service disruptions, the predictive power of initial expectations on performance perception is not uniform across all users but varies systematically with their prior experience.

The findings have practical implications for ARL operators, who should tailor communication and response strategies based on user experience levels. As potential users' perceptions are more strongly influenced by initial expectations, proactive expectation management through clear and transparent communication is recommended prior to their first use. For example, operators could employ social media campaigns, website FAQs or digital informational content to outline standard procedures and potential response actions. Given the strong link between PCV and DSC, operators should focus on the three dimensions of justice theory: distributive justice (e.g., providing a timely ride to the airport), procedural justice (ensuring response speed and transparency) and interactional justice (showing empathy and respect from staff). These measures help establish realistic and positive initial expectations.

As existing users evaluate performance against a baseline of prior experience and are less influenced by initial expectations alone, strategies should focus on reinforcing trust and leveraging

their experience. More interactive and relationship-focused approaches are recommended. For example, ARL operators could organize open-day sessions, user forums or feedback workshops to discuss disruption management plans, enabling experienced users to share insights and feel valued. During service disruptions, communication should highlight consistency with past successful recoveries and acknowledge their loyalty, potentially through tailored updates or compensation based on usage history.

This study is subject to several limitations. First, the use of a hypothetical scenario, typical of stated preference studies, captures user perceptions and intentions rather than actual behaviours during a real-time disruption. Actual reactions may involve heightened stress or different decision-making factors not fully represented here. Future study utilising revealed preference data or field experiments could validate these findings in actual disruption contexts. Second, while the comic strip was designed to enhance realism, the specific narrative (solo traveller, flash flood disruption) and depicted response actions represent only one possible scenario. The applicability of the findings may vary across different scenarios and response strategies. Future study should explore these variations to improve generalizability. For example, studies could develop and test comparative comic-based scenarios featuring different disruption types (e.g., technical failures, security incidents) and alternative response strategies (e.g., different compensation levels, communication styles). Finally, the sample was drawn from train passengers at interchange stations in Kuala Lumpur using convenience sampling. Although the sample size provided adequate statistical power, it may introduce sampling bias and underrepresent certain user demographics or travel patterns. Further study across more diverse populations is necessary to assess the broader applicability of the disconfirmation model.

5. Conclusion

Moderation analysis using PLS-SEM on the expectancy disconfirmation model, integrated with justice theory in the context of disruption response, confirmed that user experience significantly moderates the relationship between expectations and perceived performance. This finding demonstrates that disruption responses are not perceived uniformly: potential users' judgments are strongly influenced by initial expectations, whereas experienced users base their assessments on prior experiences. Consequently, ARL operators should implement differentiated strategies. For potential users, emphasis should be placed on proactive expectation management through transparent communication and justice-based messaging. For experienced users, trust-building efforts should focus on consistency with prior service recoveries, personalized engagement and opportunities for feedback and dialogue. This tailored approach ensures that both user groups perceive disruption responses as fair, reliable and aligned with their expectations and experiences.

Given that potential and existing users process response actions differently, efficiently identifying user types during chaotic events is essential for implementing tailored response strategies. Investigating how operators can utilize existing user data (e.g., loyalty programs, ticket types) or rapid on-site assessments to segment passengers may provide valuable for operationalizing tailored disruption management during real-time service disruptions.

Although the study was not designed to empirically compare the comic strip methodology with a traditional text-only format, the approach demonstrates potential for addressing the limitations of text-only scenarios in conveying complex situations, particularly for potential users. The high participation rate of 86% and strong statistical outcomes, including sufficient power, indicate that the comic-based questionnaire was a viable and effective tool for eliciting reliable stated-preference responses from diverse user groups. This successful implementation positions the comic-based methodology as a potentially valuable alternative or complementary approach for stated preference

research, especially for visualising complex scenarios such as ARL disruptions, and supports its application in contexts where traditional methods may be inadequate.

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