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The Role of Parasocial Interaction and Fear of Missing Out (FOMO) in Mediating the Influence of Streamer Attractiveness on Impulse Buying in Live Streaming (A Study on the Roughneck 1991 Brand on Shopee)

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A R T I C L E I N F O
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A B S T R A C T
This study aims to analyze the role of parasocial interaction and fear of missing out (FOMO) in mediating the influence of streamer attractiveness on impulse buying during live streaming of the Roughneck 1991 brand on Shopee. This study uses a quantitative approach with purposive sampling method involving 216 respondents residing in the Special Region of Yogyakarta who have purchased Roughneck 1991 products through live streaming on Shopee. Data were analyzed using Structural Equation Modeling (SEM) with the help of SmartPLS 4.0. The results of the study show that streamer attractiveness has a positive and significant effect on parasocial interaction and FOMO. However, streamer attractiveness has a significant negative effect on impulse buying directly. Parasocial interaction is proven to have a positive and significant effect on FOMO and impulse buying. FOMO also has a positive and significant effect on impulse buying. Important findings indicate that parasocial interaction significantly mediates the effect of streamer attractiveness on impulse buying, whereas FOMO is not significant as a single mediating variable in this relationship

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INTRODUCTION

In today's digital era, social media plays an important role in shaping consumer behavior, and the rapid growth of information technology has brought a revolution in the communication styles of modern society worldwide (Hartanto et al., 2022). With digital technology, especially the internet and e-commerce, consumer behavior in shopping activities has changed. The ease and convenience offered through online shopping make this activity increasingly popular among the public, especially for the millennial and Generation Z. The development of increasingly sophisticated technology has opened opportunities for consumers to shop while enjoying live broadcasts on e-commerce applications such as Shopee. By leveraging the influence of influencers in live streaming, consumers can interact directly with the streamer, thereby establishing a relationship that forms a community, and the dynamic interactive nature of this live streaming can effectively encourage consumers to make product purchases (Luo et al., 2024). Consumers who have perceptions of a product branded by an influencer cause some consumers to have the same desire to own the same product as the influencer, commonly referred to as FOMO. This creates social fear because of the worry that others have more interesting experiences compared to oneself (Apolo & Kurniawati, 2023), therefore sometimes consumers feel the desire to buy the same product when a trend created by influencers occurs, which can lead to unplanned purchases.

LITERATURE REVIEW

This research is based on the Self-Determination Theory, which emphasizes the innate growth tendencies of individuals and psychological needs, stating that individuals are intrinsically motivated by the fulfillment of three core psychological needs: autonomy, competence, and relatedness. This theory is relevant in the e-commerce environment because it provides sensory and cognitive inputs comparable to physical environments, thereby influencing customers' intrinsic motivation and driving their behavior (Ryan & Deci, 2020). Streamer attractiveness is the audience's impression of the streamer's personality, appearance, and talent during the live streaming process (Ha & Lam, 2016). Attractiveness tends to be needed by influencers to be able to attract the attention of their followers. Parasocial interaction is an experience in the virtual world that allows social media users to understand the personal life of another social media user and consider it real (Yılmazdoğan et al., 2021). Fear of Missing Out (FOMO) is the widespread concern that others might have rewarding experiences that are not experienced by oneself (Blose et al., 2023). Impulse buying is a purchase that occurs without prior planning, influenced by certain stimuli, and the decision is made spontaneously at that moment (Piron, 1991) in (Angelina & Gunawan Henuk, 2024). Here are the results of the hypothesis development:

H1: Streamer Attractiveness has a positive and significant effect on Parasocial Interaction

Research by Dion et al., (1972), Hsu, (2020), and Rungruangjit, (2022) shows that streamer attractiveness has a positive and significant effect on parasocial interaction. This condition proves that streamer attractiveness plays

an important role in fostering stronger parasocial relationships between customers and streamers, especially in the context of social media or e-commerce as a shopping platform conducted via live streaming.

H2: Streamer Attractiveness has a positive and significant effect on Fomo

Research by Lin et al., (2021), Fang et al., (2020), Liu & Ma, (2020) shows that streamer attractiveness has a positive and significant effect on FOMO. This condition proves that streamer attractiveness has an important influence in triggering FOMO behavior, which is the fear of losing connection with the streamer.

H3: Streamer Attractiveness has a positive and significant effect on Impulse Buying

Research by Tian et al., (2023), Ming et al., (2021), Zheng et al., (2019) shows that streamer attractiveness has a positive and significant effect on impulse buying. This condition proves that streamer attractiveness has an important influence in triggering consumer behavior in impulse buying within live streaming marketing.

H4: Parasocial Interaction has a positive and significant effect on Fomo

Research by Gabriel et al., (2017), Alabri, (2022), Paravati et al., (2020) shows that parasocial interaction has a positive and significant effect on FOMO. This condition proves that social interaction carried out on live streaming can trigger FOMO for three main reasons: the real-time nature of live streaming creates immediate awareness of opportunities, parasocial bonds increase exposure to FOMO-inducing content, and the commercial nature of live streaming causes real losses, for example, missed limited offers.

H5: Parasocial Interaction has a positive and significant effect on Impulse Buying

Research by Vazquez et al., (2020), Lin et al., (2021), Chen et al., (2022) shows that parasocial interaction has a positive and significant effect on impulse buying. This condition proves that social interaction conducted by consumers during live streaming can increase consumers' desire to engage in unplanned shopping.

H6: Fomo has a positive and significant effect on Impulse Buying

Research by Çelik & Eru, (2019) and Zhang et al., (2022) shows that FOMO has a positive and significant effect on impulse buying. This condition indicates that customers can watch live streaming from attractive streamers and make impulse purchases of recommended products to alleviate FOMO during live streaming and for supported products.

H7: Parasocial interaction mediates the influence of Streamer Attractiveness on Impulse Buying

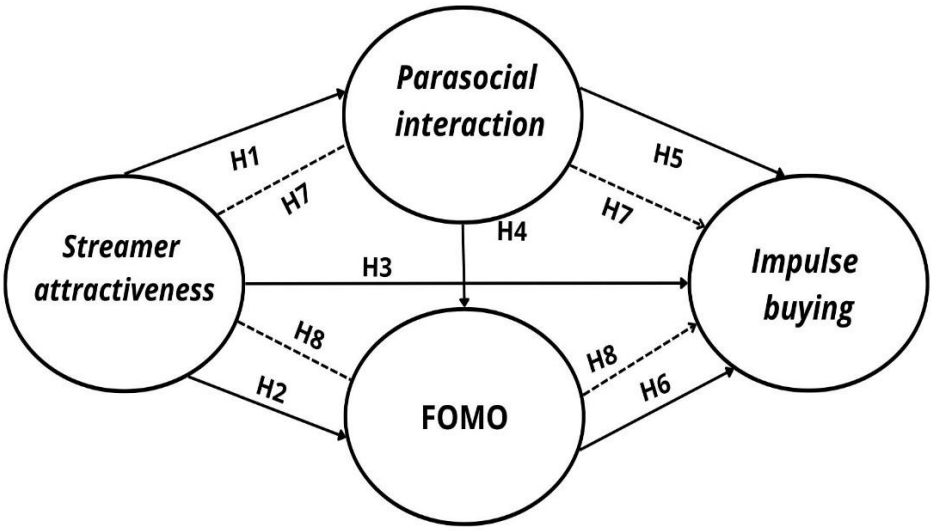
Research by Yuan & Lou, (2020), Sokolova & Kefi, (2020), Xiang et al., (2016) shows that parasocial interaction can mediate the relationship between streamer attractiveness and impulse buying. This condition indicates that in live streaming marketing, streamer attractiveness encourages parasocial interaction

between the streamer and consumers, consequently driving consumers toward impulse buying.

H8: Fear of Missing Out mediates the effect of Streamer Attractiveness on Impulse Buying

Research by Chan et al., (2017), Xu et al., (2020), Lee & Chen, (2021) shows that FOMO can mediate the relationship between streamer attractiveness and impulse buying. This condition indicates that streamer attractiveness has the potential to shape customer behavior in impulse buying through the mediation of FOMO in the context of live streaming marketing (Ishak et al., 2025; Fatmawati et al., 2021).

Research Model



Source: (K. Li et al., 2025)
Figure 1. Research Model

METHODOLOGY

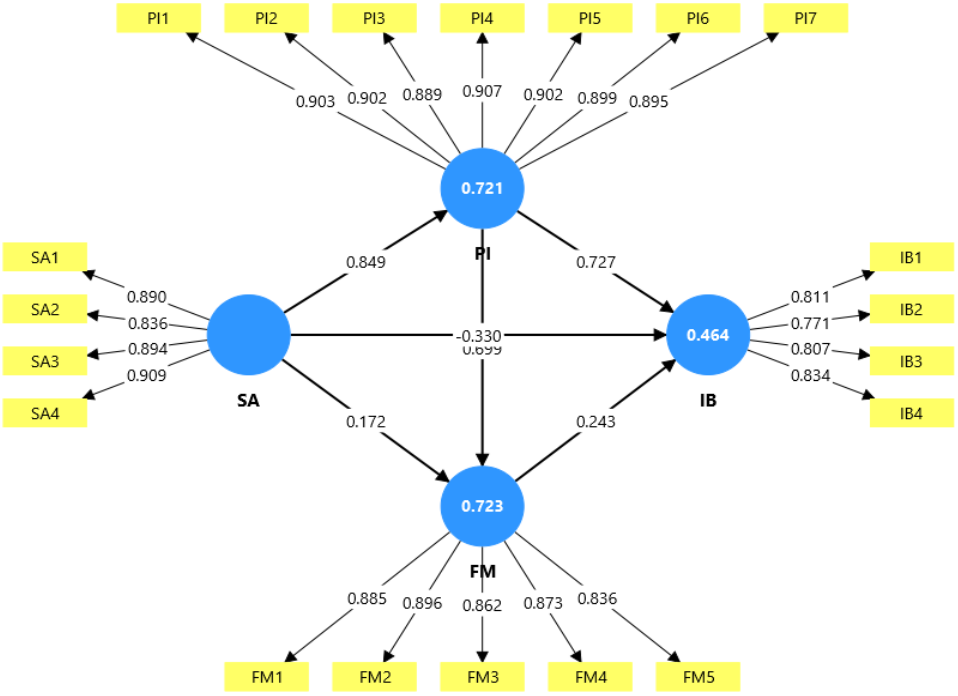
This study uses a quantitative approach with purposive sampling method. The research object is the Roughneck 1991 brand, a local Indonesian fashion brand popular among millennials and Gen Z. The research subjects are consumers who have purchased Roughneck 1991 products at least once and have watched live streaming promoting the brand on the Shopee platform. The sample selection criteria are living in the Special Region of Yogyakarta, having a Shopee account, being at least 18 years old, having purchased Roughneck 1991 products at least once, and having watched live streaming promoting Roughneck 1991 on Shopee. Based on calculations using Hair et al. (2009) as a reference, the minimum sample size is 200 respondents (20 indicators x 10). This study successfully collected 216 respondents with 205 data points that met the criteria for analysis. Data were collected through a questionnaire with a 1-5 Likert scale and analyzed using Structural Equation Modeling (SEM) with the help of SmartPLS 4.0.

Validity testing was conducted through convergent validity (loading factor > 0.70 and AVE > 0.50) and discriminant validity (Fornell-Larcker, HTMT < 0.90, and cross loading). Reliability testing was performed using composite reliability and Cronbach's alpha with a minimum value of > 0.70.

RESEARCH RESULT

Instrument Quality Testing Results

Outer Model Test Results



Source: SMARTPLS 4.0, 2025

Figure 2. Outer Model

Analysis of the outer model measurement shows the relationship of latent variables with their indicators. To ensure that the measures used are appropriate to be used as indicators or reliable. Evaluation of the measurement model is carried out through factor analysis by testing the convergent validity and discriminant validity of the indicators forming the latent constructs. While reliability testing is done in two ways, namely with Cronbach's alpha and composite reliability.

Convergent Validity Test Results

The validity test can be determined through the results of the loading factor. A loading factor value of more than 0.70 indicates that the indicators used have good validity according to Hair et al., (2019). The next validity test can be seen from the AVE value, which is expected to be > 0.50 (Hair et al., 2019). The results of the validity test are presented in Table 1 below.

Table 1. The Results of the Validity Test are Presented

Variable	Indicator	*Loading Factor*	AVE	Description
Streamer Attractiveness	SA 1	0,890	0,779	Valid
	SA2	0,836		Valid
	SA3	0,894		Valid
	SA4	0,909		Valid
Parasocial Interaction	PI 1	0,903	0,809	Valid
	PI 2	0,902		Valid
	PI 3	0,889		Valid
	PI 4	0,907		Valid
	PI 5	0,902		Valid
	PI 6	0,899		Valid
	PI 7	0,895		Valid
Fear of Missing Out	FOMO 1	0,885	0,758	Valid
	FOMO 2	0,896		Valid
	FOMO 3	0,862		Valid
	FOMO 4	0,873		Valid
	FOMO 5	0,836		Valid
Impulse Buying	IB 1	0,811	0,650	Valid
	IB 2	0,771		Valid
	IB 3	0,807		Valid
	IB 4	0,834		Valid

Source: SMARTPLS 4.0, 2025

Based on the results of the convergent validity test, all indicators in both independent and dependent variables have loading factor values greater than 0.7 and AVE values exceeding 0.5, thus having good validity.

Discriminant Validity Test Results

The acceptable tolerance limit for discriminant validity can be determined through the Heterotrait-Monotrait Ratio (HTMT) value, which should not exceed 0.90 according to the recommendation (Hair et al., 2019). The HTMT results are presented in Table 2 below.

Table 2. The HTMT Results are Presented

Variable	Heterotrait-Monotrait Ratio (HTMT)	Description
Streamer Attractiveness <-> *Parasocial Interaction*	0,886	Valid
Streamer Attractiveness <-> *Fear Of Missing Out*	0,818	Valid
Streamer Attractiveness <-> *Impulse Buying*	0,422	Valid
Parasocial Interaction <-> *Fear Of Missing Out*	0,897	Valid
Parasocial Interaction <-> *Impulse Buying*	0,636	Valid
Fear Of Missing Out <-> *Impulse Buying*	0,601	Valid

Source: SMARTPLS 4.0, 2025

Based on the results of the discriminant validity test, all indicators have HTMT values lower than 0.9, so the discriminant validity shows good results.

Reliability Test Results

Reliability testing aims to examine the extent to which the measurement of a test remains consistent when conducted repeatedly on subjects under the same conditions (Yudhistira & Sumarhadi, 2023). Reliability testing is carried out to determine the consistency of the measuring instrument using composite reliability and Cronbach's alpha values. According to Hair et al., (2021), if the composite reliability value > 0.70 and Cronbach's alpha > 0.70, the instrument is considered reliable. The results of composite reliability and Cronbach's alpha are presented in Table 3 below.

Table 3. Composites Reliability and Cronbach's Alpha

Variable	*Composites Reliability*	*Cronbach's Alpha*	Description
Streamer Attractiveness	0,934	0,907	Reliable
Parasocial Interaction	0,967	0,961	Reliable
Fear Of Missing out	0,940	0,920	Reliable
Impulse Buying	0,881	0,835	Reliable

Source: SMARTPLS 4.0, 2025

Based on the results of reliability testing, all variables in the study, both independent and dependent variables, show composite reliability and Cronbach's alpha values above 0.70, which means that each construct has a high level of reliability in measuring its indicators.

Descriptive Analysis Results

Descriptive statistical analysis provides an overview or description of data seen from the mean, standard deviation, variance, maximum, and minimum values. Descriptive analysis can give an illustration of the answers given by respondents to each statement representing the variables. The results of the descriptive analysis are presented in the following Table 4.

Table 4. Descriptive Statistics Results

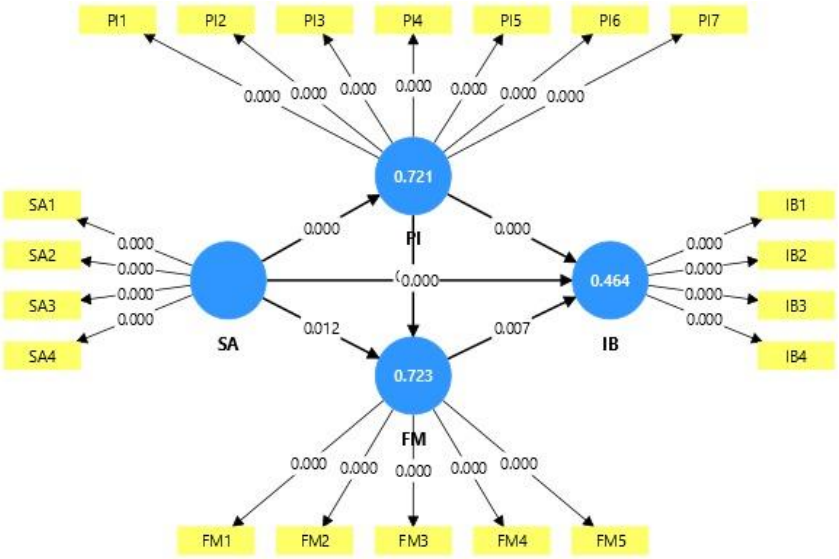
Code	Variable	Minimum	Maximum	Mean	Std Deviation	Description
SA 1	Streamer Attractivenes	1	5	3,366	1,371	Busy
SA 2		1	5	3,839	1,361	Tall
SA 3		1	5	3,400	1,327	Tall
SA 4		1	5	3,507	1,433	Tall
PI 1	Parasocial Interaction	1	5	3,629	1,177	Tall
PI 2		1	5	3,849	1,390	Tall
PI 3		1	5	3,673	1,154	Tall
PI 4		1	5	3,766	1,348	Tall

Code	Variable	Minimum	Maximum	Mean	Std Deviation	Description
PI 5		1	5	3,600	1,204	Tall
PI 6		1	5	3,829	1,323	Tall
PI 7		1	5	3,668	1,142	Tall
FM 1	Fear Of Missing Out	1	5	3,785	1,056	Tall
FM 2		1	5	4,034	1,170	Tall
FM 3		1	5	3,810	1,025	Tall
FM 4		1	5	3,937	1,135	Tall
FM 5		1	5	3,898	1,061	Tall
IB 1	Impulse Buying	1	5	2,780	1,263	Busy
IB 2		1	5	3,541	1,377	Tall
IB 3		1	5	2,834	1,300	Busy
IB 4		1	5	2,805	1,373	Busy

Source: SMARTPLS 4.0, 2025

Based on the results of the descriptive statistical analysis, the variables of streamer attractiveness, parasocial interaction, and fear of missing out are each in the high category, indicating positive perception, strong emotional involvement, and respondents' concern about missing out on information on social media, while the impulse buying variable is in the medium category, which indicates a moderate level of spontaneous buying tendency.

Inner Model Test Results



Source: SMARTPLS 4.0, 2025

Figure 3. Inner Model

R-Square (R^2) Test Results

R-Square, also known as the coefficient of determination, describes the extent to which the dependent variable can be explained by the independent variables. An R-square value of 0.75 is considered strong, 0.50 is considered moderate, and 0.25 is considered weak (Hair et al., 2019). The results of the R-Square calculation can be seen in the following table:

Table 5. Adjusted R-Square

Variable	*R-square adjusted*	Description
Fear Of Missing Out	0,720	Moderate
Impulse Buying	0,456	Weak
Parasocial Interaction	0,720	Moderate

Source: SMARTPLS 4.0, 2025

As much as 72% of the variation in fear of missing out can be explained by streamer attractiveness and parasocial interaction, while the remaining 28% is influenced by other factors outside the study. In addition, 72% of the variation in parasocial interaction is influenced by streamer attractiveness, with the remaining 28% explained by other factors. Meanwhile, only 45.6% of the variation in impulse buying can be explained by streamer attractiveness, fear of missing out, and parasocial interaction, while the remaining 54.4% is influenced by factors outside the study variables.

Hypothesis Testing Results

Direct Influence

The direct effect between variables can be seen from the bootstrapping results in Smart-PLS in the form of path coefficient values. The path coefficient values can be seen in the following table:

Table 6. Path Coefficient

Indicator	**Variable**	***Original sample* (O)**	***Sample mean* (M)**	**Standard deviation (STDEV)**	**T statistics**	**P values**	**Description**
H1	*Streamer Attractiveness* <-> *Parasocial Interaction*	0,849	0,851	0,017	49,214	0,000	Positive and Significant (Accepted)
H2	*Streamer Attractiveness* <-> *Fear of Missing Out*	0,172	0,173	0,069	2,500	0,012	Positive and Significant (Accepted)
H3	*Streamer Attractiveness* <->*Impulse Buying*	-0,330	-0,333	0,094	3,505	0,000	Negative and Significant (Rejected)
H4	*Parasocial Interaction* <-> *Fear of Missing Out*	0,699	0,700	0,068	10,302	0,000	Positive and Significant (Accepted)
H5	*Parasocial Interaction* <-> *Impulse Buying*	0,727	0,728	0,095	7,678	0,000	Positive and Significant (Accepted)
H6	*Fear of Missing Out* <->	0,243	0,246	0,090	2,711	0,007	Positive and Significant

Indicator	Variable	*Original sample* (O)	*Sample mean* (M)	Standard deviation (STDEV)	T statistics	P values	Description
	Impulse Buying						(Accepted)

Source: SMARTPLS 4.0, 2025

Table 6 explains the path coefficient results used to test the hypothesis. The following is an explanation of the hypothesis test results to examine the direct effect:

H1: Streamer Attractiveness <-> *Parasocial Interaction*

Based on the results of hypothesis test 1, it shows a path coefficient of 0.849 from the original sample (O) value, indicating that the result is positive or in the same direction. This means, the higher the streamer attractiveness, the higher the parasocial interaction performed. The t-statistic value is 49.214 (t > 1.96) and the p-value is 0.000 (p < 0.05). These t-statistic and p-value results indicate significant outcomes. This shows that streamer attractiveness has a positive and significant effect on parasocial interaction, therefore it can be stated that H1 is accepted.

H2: Streamer Attractiveness <-> *Fear of Missing Out*

Based on the results of hypothesis test 2, showing a path coefficient of 0.172 from the original sample (O) value, it can be seen that the result is positive or in the same direction. This means that the higher the streamer attractiveness, the higher the fear of missing out experienced. The t-statistic value is 2.500 (t > 1.96) and the p-value is 0.012 (p < 0.05); these t-statistic and p-value results indicate a significant result. This shows that streamer attractiveness has a positive and significant effect on fear of missing out, thus it can be stated that H2 is accepted.

H3: Streamer Attractiveness <->*Impulse Buying*

Based on the results of hypothesis test 3, showing a path coefficient of -0.330 from the original sample (O) value, it can be seen that the result is negative or in the opposite direction. This means that the higher the level of streamer attractiveness, the tendency for impulsive buying actually decreases. The t-statistic value is 3.505 (t > 1.96) and the p-value is 0.000 (p < 0.05); these t-statistic and p-value results indicate a significant outcome. This shows that streamer attractiveness has a negative and significant effect on impulse buying, so it can be stated that H3 is rejected.

H4: Parasocial Interaction <-> *Fear of Missing Out*

Based on the results of hypothesis test 4, it shows a path coefficient of 0.699 from the original sample (O) value, indicating that the result is positive or in the same direction. This means that the higher the level of parasocial interaction, the

higher the fear of missing out behavior exhibited. The t-statistic value is 10.302 (t > 1.96) and the p-value is 0.000 (p < 0.05). These t-statistic and p-value results indicate a significant outcome. This shows that parasocial interaction has a positive and significant effect on fear of missing out, so it can be stated that H4 is accepted.

H5: Parasocial Interaction <-> *Impulse Buying*

Based on the results of hypothesis test 5, it shows a path coefficient of 0.727 from the original sample (O) value, indicating that the result is positive or in the same direction. This means, the higher the parasocial interaction, the higher the impulse buying performed. The t-statistic value is 7.678 (t > 1.96) and the p-value is 0.000 (p < 0.05). These t-statistic and p-value results indicate significant outcomes. This shows that parasocial interaction has a positive and significant effect on impulse buying, so it can be stated that H5 is accepted.

H6: Fear of Missing Out <-> *Impulse Buying*

Based on the results of hypothesis test 6, it shows a path coefficient of 0.243 from the original sample (O) value, indicating that the result is positive or in the same direction. This means, the higher the fear of missing out, the higher the impulse buying that occurs. The t-statistic value is 2.711 (t > 1.96) and the p-value is 0.007 (p < 0.05). These t-statistic and p-value results indicate significant results. This shows that FOMO has a positive and significant effect on impulse buying, so it can be stated that H6 is accepted.

Indirect Influence

Table 7. Spesific Indirec Effects

Indicator	**Variable**	***Original sample* (O)**	***Sample mean* (M)**	**Standard deviation (STDEV)**	**T statistics**	**P values**	**Description**
H7	*Streamer Attractiveness* <-> *Parasocial Interaction* <-> *Impulse Buying*	0,617	0,619	0,081	7,580	0,000	Fully Mediating
H8	*Streamer Attractiveness* <-> *Fear of Missing Out* <-> *Impulse Buying*	0,042	0,046	0,029	1,467	0,142	Unable to Mediate

Source: SMARTPLS 4.0, 2025

H7: Streamer Attractiveness <-> Parasocial Interaction <-> Impulse Buying

Based on the results of hypothesis test 7, it shows a path coefficient of 0.617 from the original sample (O) value, indicating that this result is positive or in the same direction. The t-statistic value is 7.580 (t > 1.96) and the p-value is 0.000 (p < 0.05). These t-statistic and p-value results indicate significant results. This shows that parasocial interaction can significantly fully mediate the effect of streamer attractiveness on impulse buying.

H8: Streamer Attractiveness <-> Fear of Missing Out <-> Impulse Buying

Based on the results of hypothesis test 8, it is shown by the original sample value (O) of 0.042, which indicates a positive but very weak effect. In addition, the t-statistic value is 1.467, which is smaller than the critical value of 1.96, and the p-value is 0.142, which is greater than the significance level of 0.05. Thus, this indirect effect is stated to be statistically insignificant. In other words, fear of missing out does not act as a mediating variable in the relationship between streamer attractiveness and impulse buying.

DISCUSSION

The results of the outer model testing indicate that all indicators meet the validity requirements with outer loading values greater than 0.70. The Average Variance Extracted (AVE) values for each variable also meet the validity criteria with values above 0.50. Streamer attractiveness has an AVE of 0.779, parasocial interaction 0.809, FOMO 0.758, and impulse buying 0.650. The reliability test results show that the composite reliability and Cronbach's alpha values for all variables are above 0.70, indicating that the instruments are reliable. The results of the hypothesis testing show that streamer attractiveness has a positive and significant effect on parasocial interaction ($\beta = 0.849$; $t = 49.214$; $p = 0.000$) and FOMO ($\beta = 0.172$; $t = 2.500$; $p = 0.012$). However, streamer attractiveness has a significant negative effect on impulse buying directly ($\beta = -0.330$; $t = 3.505$; $p = 0.000$). Parasocial interaction has a positive and significant effect on FOMO ($\beta = 0.699$; $t = 10.302$; $p = 0.000$) and impulse buying ($\beta = 0.727$; $t = 7.678$; $p = 0.000$). FOMO also has a positive and significant effect on impulse buying ($\beta = 0.243$; $t = 2.711$; $p = 0.007$). The mediation effect test results show that parasocial interaction significantly mediates the effect of streamer attractiveness on impulse buying ($\beta = 0.617$; $t = 7.580$; $p = 0.000$). However, FOMO is unable to mediate the relationship between streamer attractiveness and impulse buying ($\beta = 0.042$; $t = 1.467$; $p = 0.142$). The R-square value indicates that 72% of the variation in FOMO and parasocial interaction can be explained by the independent variables, while 45.6% of the variation in impulse buying can be explained by this research model.

CONCLUSIONS AND RECOMMENDATIONS

This study concludes that streamer attractiveness has a positive and significant effect on parasocial interaction and FOMO, but has a significant negative effect on impulse buying directly. Parasocial interaction is proven to be a strong mediator that connects streamer attractiveness with impulse buying, whereas FOMO is unable to mediate this relationship independently. These findings provide practical implications for brands to focus more on building

strong parasocial relationships between streamers and audiences in live streaming commerce strategies.

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