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RESEARCH ARTICLE

FLOW-BASED LIVE-STREAMING SHOPPING

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Abstract

The current study aims to construct a model describing consumer behaviors of live-streaming e-commerce based on flow theory, on top of socio-technical system theory, as a part of the theoretical contribution to the extant literature, including examining the moderating function of consumer cognitive styles represented by innovativeness and compulsive buying tendency in shaping the relationship between the flow experience of consumers and loyalty. Using social media for frequent live-streaming e-commerce activities in China, this study collected data from 517 samples who are customers of the live-streaming e-commerce shopping platforms. Structural Equation Modeling (SEM) was used to analyze the collected data. The result discovers the loyalty and addiction base of compulsive buying, implying both planned and unplanned characteristics and rational versus impulsiveness in purchasing. Numerous insights that help deepen our understanding of customer behaviors in live-streaming e-commerce are offered by both theoretical and practical implications. On the theoretical aspect, the study supports the practical value and validity of flow and socio-technical systems theory for live-streaming e-commerce shopping applications, with social value as a significant predictor of flow and loyalty.

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Introduction:-

Live-streaming e-commerce is a recent socio-commerce (Xie et al., 2022) fast becoming a significant channel for online retailing and sales (Roggeveen and Sethuraman, 2020), to broaden revenue and consumption opportunities, such as travel live-streaming (Xu, Huang, and Shang, 2021). Marketers consider live-streaming an efficient channel for prompting customers' quick purchase decisions (Wang et al., 2022), stimulated by the socio-technical advantages of live-streaming and its novelty, such as social functions characterized by interactivity, simultaneity, and social presence (Gao et al., 2021) and real-time technological advantage (Fei et al., 2021). Live-streaming e-commerce sales on the Chinese online shopping platform Taobao are estimated at 500 billion yuan (Statista, 2022a), growing at an average rate of 76% in Europe, the Middle East, and North America (Statista, 2022b) in 2021.

Consumer behaviors are a common subject of the research study in live-streaming e-commerce (Ma, Zou, and Lv, 2022). Due to the unique socio-technical features of live-streaming e-commerce (Li, Li, and Cai, 2021), research

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scholars adopt socio-technically related theories to guide their studies. Examples include the stimulus-organism-response (S-O-R) theory (Fei et al., 2021) and emotional contagion theory (Meng et al., 2021), which considers the social stimulation effect. The IT affordance theory examines the affordances of live-streaming technology. Affordances describe the relationship between consumers and their cognition of the environment (Saffanah, Handayani, and Sunarso, 2022; Parchoma, 2014). The affordances are enabled, for instance, by technological features such as visibility (Sun et al., 2019). Affordance theory strongly emphasizes psychology (Rahman and Sciara, 2022). The theory of emotion is stressed to the extreme that emotion can impair the cognitive function of consumers, which leads to impulsive buying urge and behavior (Lo et al., 2022). Other preferred consumer behavior theories include “rational action theory, technology acceptance model, diffusion of innovations, and theory of planned behavior” (Zhou et al., 2021: 2).

However, the existing literature needs an understanding of how to flow theory can be applied to understand live-streaming e-commerce consumer behaviors. Thus, the study aims to construct a model describing consumer behaviors based on flow theory, on top of socio-technical system theory, as a part of the theoretical contribution to the extant literature, including examining the moderating function of consumer cognitive styles represented by innovativeness and compulsive buying tendency in shaping the relationship between the flow experience of consumers and loyalty.

In note passing, according to Muller et al. (2005), compulsive buying manifests as a “regular obsession with buying or impulses to buy that are seen as irresistible, obtrusive, and senseless.” It can be a consumer’s primary means of relieving stress, frustration, and disappointment (Phau and Woo, 2008). Csikszentmihalyi (1996: 29) defined flow as a “condition in which people are so engrossed in a task that nothing else seems to matter; experiencing it is so pleasurable that people will do it even at enormous cost for doing it.” Flow experiences can occur depending on the many contextual circumstances; for example, e-sport supporters are more likely to focus on the match when identifying the athlete’s unique abilities and surprising game plans (Chou and Ting, 2003). The basic tenets of flow theory report enjoyment, cognitive engrossment, and a loss of sense of location and time as flow characteristics (Kim and Kim, 2020).

Literature Review:-

Flow Theory

The “flow” concept’s originator is Csikszentmihalyi (1975; 1991; 1996; 2003), from whom this study draws its direct inspiration. Consumers’ flow experience is a state of complete engrossment in the activity they involve (Bao and Huang, 2018), such as live-streaming e-commerce. In fact, according to Csikszentmihalyi (2022), humans require a flow state to function, which provides a thrust to push them to advance and reach higher levels of performance. For flow to arise, the flow activities should be pleasurable and motivating enough to enable consumers to concentrate on the consumption process (Csikszentmihalyi, 2022). In a concentrated flow state, consumers will feel that time pass quickly, even to the extent that they may feel total absorption in the sense of action and awareness merging into one (Csikszentmihalyi, 1990a). As a result, flow activities allow people to channel their psychic energy commitment to the consumption activity, leading to a state of loyalty. For instance, when students whose abilities match the learning challenges and the subject is fascinating, a flow state arises, and the students become committed or loyal to the learning session (Rathunde and Csikszentmihalyi, 2005). Thus, the flow state is assumed to predict consumer loyalty:

H1. Flow state has a positive direct effect on consumer loyalty.

Now that flow state predicts loyalty. The following will discuss the drivers for flow state and, correspondingly, shape loyalty. According to Csikszentmihalyi (1990b), a pleasant moment is crucial for the emergence of a flow experience because it creates the right conditions for being swept along like a river current. The flow-like experience differs from ordinary consciousness by combining action and awareness that “the mind falls into the activity as if actor and action have become one” (Csikszentmihalyi, 1990b: 127). Csikszentmihalyi (2020: 104) depicts two pathological social states—*anomie* and *alienation*, which have similar meanings to anxiety and boredom, respectively—that make it difficult to feel the flow. People become uncomfortable when there are no rules in an *anomie* setting, as with live-streaming e-commerce. As an antidote to anxiety, this study adopts the argument from Faqih (2022) that consumer trust is “a key prerequisite to quiet the noise associated with the uncertainty, insecurity, and ambiguous nature of Internet buying technology successfully” (p.1). Accordingly, the hosts or anchors of live streaming services should work to influence consumer trust. Without feeling the possibility of accomplishing a goal, as emphasized in Kristine Marin Kawamura’s interview with Csikszentmihalyi (2014), the

flow will not arise. Thus, trust implies a decrease in ambiguity (Lu and Chen, 2021). Gaining consumer trust reduces anxiety (Hong, Juan, and Hung, 2022) and creates an environment conducive to experiencing flow, such as immersion and a state of focus (Csikszentmihalyi, 1990a;b). The rationale put forward by Csikszentmihalyi (1975; 2022) and the considerations above lead this study to assume trust as a prerequisite for flow to occur rather than assuming flow experience to alter trust (Bao and Huang, 2018; Jamshidi et al., 2018).

Accordingly, the trust-driven flow-induced hypotheses are assumed:

H2a. Consumer trust has a positive direct effect on the flow state.

H2b. Consumer trust has a positive direct effect on loyalty to live-streaming e-commerce.

The second barrier to people experiencing flow is boredom. Csikszentmihalyi (2022) uses the social pathology concept of “alienation,” which is “in many ways the opposite of anomie,” to illustrate how boredom occurs when the social system forces people to act in ways that are counter to their goals. Overly rigidity inevitably results in boredom (p. 104). Therefore, because customers will not put their psychic energy into what is desirable owing to a lack of enjoyment (Csikszentmihalyi, 2022: 104), concentration and flow states will not occur (Atombo et al., 2017). Whether they are enjoyment (a mild but effective mood) or emotion (very intense and focused on a specific item), they are conditions for flow experience (Russell and Griffiths, 2008).

Based on the above logic, consumer enjoyment is another driver for the flow state. Therefore the following hypotheses are assumed:

H3a. Consumer enjoyment has a positive direct effect on the flow state.

H3b. Consumer enjoyment has a positive direct effect on loyalty to live-streaming e-commerce.

The concepts of trust and enjoyment can also be viewed as cognitive and affective evaluations interconnected through the lens of the cognitive appraisal theory (Folkman et al., 1986). In addition, experiences that provoke strong emotions are typically handled mentally (Brockman et al., 2017; Lazarus, 1991). Particularly, cognitive evaluation is connected to a person’s perception of the live-streaming retail deliverable (e.g., represented by consumer trust). Comparatively, customer enjoyment is represented by affective evaluation (cf. Kim et al., 2021).

Role of Live-streaming E-Commerce Addiction in Flow State and Loyalty

The flow theory advocates the role of enjoyment and non-anxiety in inducing flow states. Although consumers who are bold and aggressive reward seekers and who seek out and enjoy the pleasures of life tend to exhibit addictive behavior (Mendelson and Mello, 1986), the personality theory of addiction also shows otherwise concerning anxiety. That is, people with addictive tendencies are oftentimes in a state of anxiety (Mendelson and Mello, 1986). For instance, people, who are glued to a smartphone, show an attempt to cope with negative feelings such as loneliness, anxiety, or stress (Mason et al., 2022). The live-streaming e-commerce addiction is the subject of interest here. It can be reckoned as a mental condition like technology and Internet addiction. As the flow theory argues, its existence can augment the perceptions of enjoyment and trust (Turel, Serenko, and Giles, 2011). Addiction is different from habit (Limayem, Hirt, and Cheung, 2007) and is not merely about overuse or over-engagement (Davis, 2001), such as in live-streaming e-commerce. As McCusker (2001) and Hodgson (1986) noted, addiction is a psychological dependency that manifests in incentive sensitization. It results in a bias of attentional processing toward, for instance, live-streaming e-commerce situations, namely flow and loyalty. The loyalty relatedness is apparent as addiction is often a reinforcement of the greater past consumption (Becker, Grossman, and Murphy, 1991), leading to cyclical consumption (Docker and Feichtinger, 1993) and compulsive buying (Mason et al., 2022).

From the above reasoning, the following hypotheses are assumed for customer addiction as the driver for flow and loyalty and for relating to compulsive buying:

H4a. Consumer addiction has a direct positive effect on the flow state.

H4b. Consumer addiction has a direct positive effect on loyalty.

H4c. Consumer addiction has a direct positive effect on compulsive buying.

Socio-technical System Theory

A core principle behind establishing live-streaming e-commerce is to advance the social dimensions within the live-streaming technology platform, for instance, by displaying products to customers in real-time video live streaming (Zhang et al., 2022). In this regard, socio-technical system theory can guide research scholars and practitioners to improve the service quality and value of the live streaming system. Depending upon the consumption context and technological platform, output optimization would require different social and technical system components. For instance, in big data platforms for creating business value, an organization can use a social system represented by

organizational structure and human factors and a technical system leveraged by descriptive and prescriptive analytics (Oesterreich et al., 2022). In live streaming, the technology should enable customers to get more intuitive and customized information (Sun et al., 2019) and can shape the social atmosphere by promoting the flow of information and emotion (Bao et al., 2016). Thus, live-streaming e-commerce is also a social enabler that can generate social values such as interpersonal relationships (Wohn et al., 2018), a psychological sense of efficacy and trust in the services (Channuwong, 2014; Zhang et al., 2022), and the formation of parasocial relationships (Rungruangjit, 2022).

Accordingly, the following hypotheses are assumed:

H5a. Social value has a direct positive effect on the flow state.

H5b. Social value has a direct positive effect on loyalty.

H5c. Live-streaming e-commerce systems and service quality have a direct positive effect on the flow state.

H5d. Live-streaming e-commerce systems and service quality have a direct positive effect on loyalty.

Flow State and Loyalty in Explaining Compulsive Buying

Compulsive consumption, being a psychological condition (Horvath and Adiguzel, 2018), characterizes how consumers react either uncontrollably or due to a stimulating desire to “obtain, use, or experience a feeling, substance” (O’Guinn and Faber, 1989: 147). Compulsive consumption that involves, for instance, “alcoholism, drug abuse, eating disorders, compulsive gambling, compulsive buying, compulsive sexuality, kleptomania, compulsive working, and compulsive exercising” may induce harm to consumers or others (Hirschman, 1992: 158). The extant literature has shown many factors that can influence consumers’ compulsive buying behaviors. Consumers who show depression, boredom, or anxiety are often preoccupied with excessive buying to enhance their self-worth (Bhatia, 2019; Ersche et al., 2019). When the shopping experience is enjoyable, consumers also tend to exhibit compulsive buying (Ali, Tauni, and Ali, 2022). Tarka et al. (2022) share a similar finding, which supports the hedonistic shopping experience as a mediating mechanism for compulsive buying. A personality trait is still another factor. According to Moon, Faheem, and Farooq (2022), brand consciousness, materialism, and self-conceptual traits significantly impact how young Pakistani consumers compulsively shop. Still, other factors include avoiding social interaction and daydreaming (He, Kukar-Kinney, and Ridgway, 2018). Furthermore, Kukar-Kinney, Scheinbaum, and Schaefers (2016) note the loyalty relationship with compulsive buying in that the higher consumers’ tendency for compulsive buying, the higher their level of hedonic motivations for shopping on daily deal websites (p. 692).

Thus, the following hypotheses are assumed:

H6. Consumer enjoyment has a positive effect on compulsive buying.

H7. Flow state is a significant predictor of compulsive buying.

H8. Consumer loyalty has a positive effect on compulsive buying.

Moderation Effect of Innovativeness and Compulsive Buying Tendency

Two moderators, consumer innovativeness and compulsive buying tendency, contribute to the body of knowledge in live-streaming e-commerce, especially regarding the relationship between flow experience and consumer loyalty. Live-streaming e-commerce is a relatively recent socio-technological innovation. Accordingly, marketers and research scholars exploit, for instance, Rogers' (2003) technology diffusion theory to design creative marketing strategies and new products capable of influencing, particularly the innovators and early adopters. A strong linkage between consumer innovativeness and brand loyalty is shown in Zeng and Cleon (2018), particularly significant for new technological products, such as electric vehicles (Heidenreich et al., 2017), drone food delivery services (Hwang, Kim, and Lee, 2021), robotic restaurant (Hwang, Park and Kim, 2020), or consumer products of significant values, such as nutritional values (Li et al., 2021), or utilitarian and hedonic values (Jiang et al., 2022). The hypothesis, which assumes the moderating role of consumer innovativeness in the relationship between flow state and loyalty, underpins the tendency of such consumer traits to induce consumer excitement for new products and services, leading to favorable attitude, purchase intention, and loyalty (Shams, Brown, and Alpert, 2020). Research also shows compulsive buyers desire to experience positive, stimulating feelings while buying (Faber and O’Guinn, 1992). Thus, it is assumed in this study that compulsive buyers would stimulate and maintain a flow state, which can help them relieve the negative feeling that is the motive to buy compulsively in the first place (Channuwong et al., 2022; Kukar-Kinney et al., 2009).

Thus, the following two hypotheses are assumed:

H9. Consumer innovativeness positively moderates the relationship between flow state and loyalty.

H10. Consumer's compulsive buying tendency positively moderates the relationship between flow state and loyalty.

In sum, H1 to H10 leads to the derived theoretical framework of this study, as shown in Fig. 1.

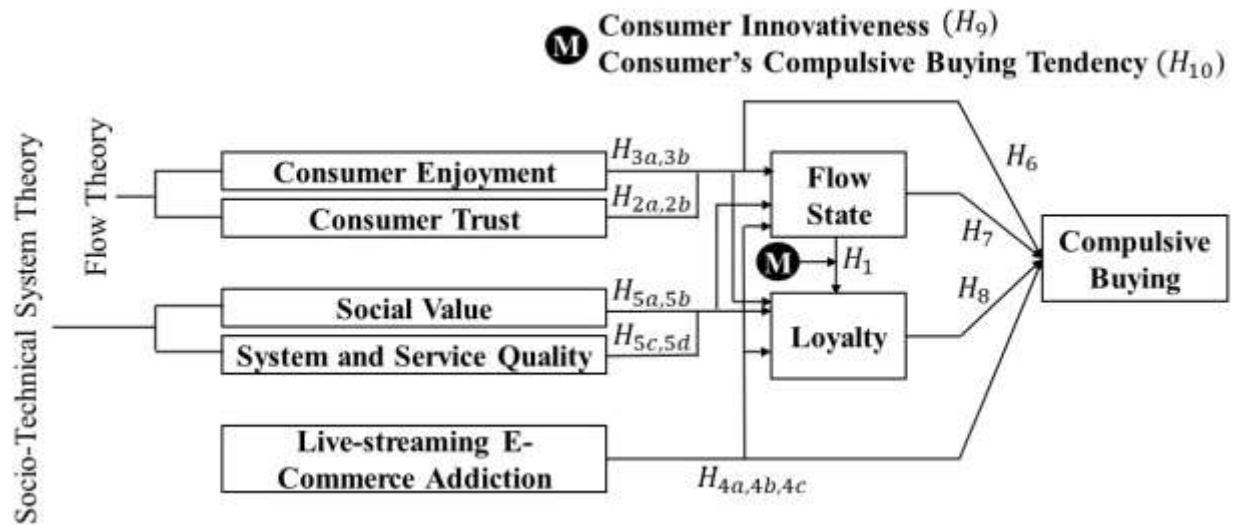


Fig.1:- The Theoretical Framework.

Method:-

Scope of Study

The study aims to construct a model describing consumer behaviors in live-streaming e-commerce based on flow theory, with a particular emphasis towards influencing the compulsive buying of consumers. As a result, this study confines the scopes of the driving mechanisms solely towards creating the conditions of flow experience that are capable of promoting compulsive buying. As noted by Csikszentmihalyi (2022), although a flow state may arise by chance, it is usually a stimulation of combined internal and external conditions. The internal conditions are consumer traits, and this study examines only two types, namely, consumer innovativeness and consumer's compulsive buying tendency. As to the external condition, a socio-technical system theory is adopted for conceptualization. In addition, the study confines the data collection means using WeChat and approaches the live-streaming shopping anchors for distribution assistance, citing that the survey has significant academic purpose.

Populations and Samples

To collect the data, the authors approach the potential respondents from the live-streaming e-commerce shopping platforms of Tao Bao, JD, Mushroom Street, Little Red Book, JumeiYoupin, and also through recommendations of the anchors to join the WeChat group for distribution of the survey. The survey was designed with a website link that helped collected the data. Due to the logistical convenience in China, the population of respondents covers the entire country. However, only the survey responses of the respondents who had actually purchased using live-streaming shopping were accepted for participation and statistical analysis. Thus, the sampling is purposive in nature. In doing so, the statistical results can better reflect the reality with narrow variances. For appropriate structural equation modeling (SEM) analysis, the study follows the guidance of Hair et al. (2006: 742) that "when the number of factors is larger than six, some of which use fewer than three measured items as indicators and multiple low communalities are present, sample size requirements may exceed 500". In addition, as each construct has, at the minimum, three measurement items, and factor loadings are more than the 0.7 thresholds, with high total variance explained (TVE), a sample size of 500 is sufficient (Hair et al., 2006).

Period/Time of the Study

The data collection was a challenging process. The study first needed the support of the live-streaming shopping anchors, and also gradual recommendations to the WeChat group. The data collection spanned two months period, from Jan 2022 to Feb 2022. The authors selected January-February 2022 as the Chinese were celebrating the Western and Chinese New Year.

Variables used in the Study

This study adopts a questionnaire-based survey approach for data collection by using the guidelines suggested by Forza (2002). The survey consisted of two parts: the general and the theoretical parts. The general part captures the demographics and psychographics information of the respondents, which includes gender, age, highest education level, career, e-commerce experience, their weekly live-streaming e-commerce usage, their most preferred platform, monthly expense budget on live-streaming shopping, and their positive or negative experience with the live-streaming shopping. The theoretical part includes all the variables presented in the theoretical framework of the study. The survey used the Likert-type 5-point scale (with 1 being strongly disagreed and 5 being strongly agreed).

The survey instrument items were all adapted from previously published studies and revised for suitability in the context of live-streaming e-commerce shopping. To ensure construct validity, the authors ensure the items match the definition of the variables. For face validity, the authors conducted using two staged procedures, first through a pilot testing of the measurement items with the subject experts who have had experiences teaching and research in the disciplines of marketing, branding, and e-commerce, followed by a pre-testing using 30 respondents with live-streaming e-commerce shopping experience. The construct's convergent and discriminant analysis were performed after the data were collected, using guidelines suggested by Fornell and Larcker (1981) and Nunnally and Berstein (1994).

Sample measurement items are given as follows:

Compulsive buying tendency describes a consumer with a tendency for impulse buying, often experienced as irresistible, intrusive, or senseless (Muller et al., 2005). The sample is I am an impulse buyer. Consumer innovativeness manifests the willingness of the consumer to try something new (Agarwal and Prasad, 1998), measured, for instance, as I am usually the first person in the market to try something new. Social value presents the benefits received in the social domain (Ciccarino et al., 2022) and measures the value received from live-streaming e-commerce that helps consumers maintain relationships with friends. Consumer trust is based on the belief that a service provider acts in the interest of its consumers (Martinez and Rodriguez del Bosque, 2013; Utz et al., 2022), measured by, for instance, the trustworthy shopping and quality of items. Consumer enjoyment is a pleasant state of the services (Lee and Park, 2022), measuring the state of consumers enjoying live-streaming shopping, which is exciting. System and service quality measure the service quality characteristics being delivered, and the app design is professional and easy to use (DeLone and McLean, 2004). Flow experience is measured following the flow theory in Csikszentmihalyi (1975) and Schiefele and Csikszentmihalyi, 1995). Samples of measurement for flow experience are: I feel completely absorbed in the live-streaming shopping; I often feel time passing quickly when attending the live-streaming e-commerce session; I often am too concentrated on the live-streaming e-commerce session and forget things I need to do, and I am usually unaware of the things surrounding me during the live-streaming e-commerce session. Loyalty measures the continuity of the relationship (Gao and Huang, 2021); for example, by the item that I would love to continue to engage in live-streaming e-commerce, and I would recommend shopping via live-streaming to others. Consumer addiction adapts some relevant constructs, such as Internet addiction, which refers to "a state where an individual has lost control of the Internet use and keeps using the Internet excessively to the point" (Israeli, Lee and Bolden III, 2019: 151), measured by, for example, I used the live-streaming e-commerce service longer than I had planned. Compulsive buying (Lejoyeux et al., 1997; Yurchisin and Johnson, 2004; Fenton-O'Creevy et al., 2018, Ridgway et al., 2008) manifests characteristics of impulsive buying, not able to resist the products exhibited during the live-streaming e-commerce shopping and an urge in the purchase.

Results:-

The quantitative survey generated 517 valid responses, as shown in Table 1, of which 42.7% of men and 57.3% of women participated. The respondents were split around 50–50% between the 18–25 years old and older age groups. The majority (51.5%) have at least a bachelor's degree. The bulk, at 36.2%, are employees of the company, followed by students at 25.3%, government agencies at 18.2%, and independent contractors at 11.6%. Table 1 also presents the comparative results of the t-test and analysis of variance (ANOVA). The significant areas are box-highlighted, as evidenced by the t-value, or F-value, and its significance levels. High school students generally show more favorable perceptions when compared to other consumer groups. Positive correlations are evidenced between the studied constructs, weekly usage frequency of live-streaming e-commerce, and monthly expense budget. Consumers who have never had a negative experience with live-streaming e-commerce show more favorable perceptions than those who have.

Table 1:- Demographic Profiles and Comparative Analysis of Constructs.

		Sample	%	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
Gender	Male	221	42.7%	3.41	3.44	3.32	3.48	3.16	3.32	3.26	3.27	3.36	3.14
	Female	296	57.3%	3.48	3.50	3.36	3.59	3.18	3.33	3.40	3.38	3.37	3.25
Age	18 Below	1	0.2%	5.00	4.00	5.00	5.00	3.00	5.00	5.00	4.00	4.00	3.00
	18-25	241	46.6%	3.41	3.45	3.30	3.50	3.15	3.28	3.30	3.26	3.35	3.16
	26-35	109	21.1%	3.56	3.65	3.49	3.71	3.32	3.43	3.46	3.45	3.44	3.32
	36-45	104	20.1%	3.39	3.39	3.27	3.53	3.02	3.29	3.28	3.30	3.26	3.23
	46 or Above	62	12.0%	3.47	3.39	3.34	3.47	3.24	3.37	3.36	3.45	3.45	3.17
Highest Education	High School	24	4.6%	3.86	3.73	3.86	3.74	3.79	3.63	3.90	3.75	3.85	3.74
	Vacation	266	51.5%	3.38	3.41	3.28	3.52	3.11	3.22	3.29	3.23	3.32	3.16
	Bachelor	118	22.8%	3.51	3.54	3.41	3.55	3.30	3.51	3.44	3.52	3.40	3.29
	Master or Above	109	21.1%	3.44	3.51	3.30	3.57	3.05	3.32	3.23	3.27	3.32	3.11
	F-Value					3.02		4.21		4.06	3.67	2.54	2.85
	Sig. (2-tailed)					0.03		0.01		0.01	0.01	0.06	0.04
Career	In School	131	25.3%	3.39	3.37	3.28	3.49	3.04	3.18	3.26	3.11	3.29	3.01
	Company Staff	187	36.2%	3.44	3.52	3.38	3.57	3.19	3.34	3.35	3.37	3.42	3.24
	Gov. Unit	94	18.2%	3.59	3.70	3.40	3.71	3.27	3.57	3.50	3.57	3.49	3.41
	Free Lancer	60	11.6%	3.47	3.40	3.36	3.43	3.40	3.40	3.35	3.34	3.35	3.35
	Other	45	8.7%	3.29	3.22	3.19	3.42	2.94	3.13	3.19	3.27	3.13	3.02
	F-Value				3.09				2.56		2.89		2.84
	Sig. (2-tailed)				0.02				0.04		0.02		0.02
E-Commerce Experience	1 Year or Less	44	8.5%	3.52	3.56	3.48	3.56	3.30	3.51	3.44	3.48	3.63	3.45
	1-2 Years	45	8.7%	3.79	3.66	3.59	3.85	3.77	3.73	3.64	3.73	3.63	3.71
	3-5 Years	151	29.2%	3.56	3.54	3.45	3.58	3.29	3.41	3.41	3.41	3.41	3.24
	5 Years or More	277	53.6%	3.32	3.40	3.21	3.48	2.99	3.19	3.24	3.20	3.26	3.07
	F-Value					3.69		8.80	5.02	3.08	4.42	3.89	6.24
	Sig. (2-tailed)					0.01		0.00	0.00	0.03	0.00	0.01	0.00
Bi-variate Coefficient				-0.13		-0.12		-0.17	-0.14	-0.10	-0.13	-0.14	-0.16
Weekly Livestreaming E-Commerce Usage	Less than 2 times	306	59.2%	3.19	3.21	3.10	3.36	2.83	3.03	3.05	3.00	3.10	2.88
	2-4 times	86	16.6%	3.81	3.80	3.62	3.71	3.54	3.69	3.55	3.75	3.68	3.58
	5-7 times	47	9.1%	4.02	3.97	3.91	4.18	3.89	4.06	4.10	3.97	3.91	4.03
	7 above	78	15.1%	3.72	3.85	3.65	3.72	3.65	3.66	3.77	3.79	3.72	3.59
	F-Value			24.71	24.23	18.91	15.77	30.81	27.23	30.54	31.10	23.77	32.86
	Sig. (2-tailed)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bi-variate Coefficient				0.28	0.31	0.27	0.22	0.34	0.31	0.35	0.34	0.30
Most Preferred Platform	TaoBao	244	47.2%	3.53	3.58	3.45	3.62	3.29	3.43	3.47	3.42	3.47	3.33
	JD	75	14.5%	3.46	3.54	3.33	3.56	3.27	3.45	3.31	3.34	3.32	3.34
	Mushroom Street	14	2.7%	4.00	3.38	3.57	3.83	3.57	3.41	4.06	3.88	3.83	3.98
	Little Red Book	33	6.4%	3.64	3.63	3.44	3.71	3.29	3.43	3.35	3.49	3.58	3.45
	Jumei Youpin	6	1.2%	4.21	3.96	4.22	3.83	3.78	4.13	3.57	4.17	4.33	3.21
	Other	145	28.0%	3.16	3.22	3.07	3.34	2.82	3.02	3.05	3.06	3.08	2.80
	F-Value			5.83	3.55	4.44	2.60	4.90	4.34	5.51	4.34	6.06	7.81
Sig. (2-tailed)			0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	
Monthly Expense Budget	Below 2000	213	41.2%	3.20	3.25	3.13	3.35	2.89	3.04	3.12	3.03	3.16	2.90
	2000-4000	100	19.3%	3.61	3.58	3.53	3.65	3.40	3.47	3.51	3.62	3.48	3.54
	4000-6000	75	14.5%	3.75	3.73	3.49	3.75	3.41	3.70	3.66	3.62	3.61	3.61
	6000 Above	129	25.0%	3.55	3.62	3.45	3.66	3.31	3.48	3.38	3.43	3.47	3.22
	F-Value			10.37	8.45	6.17	6.14	8.89	11.48	8.25	11.61	6.72	14.72
	Sig. (2-tailed)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bi-variate Coefficient				0.18	0.19	0.14	0.15	0.17	0.20	0.14	0.17	0.16	0.15
Never Negative Experience with Livestreaming E-Commerce	Yes	237	45.8%	3.70	3.66	3.55	3.69	3.44	3.61	3.56	3.50	3.55	3.41
	No	280	54.2%	3.23	3.32	3.16	3.42	2.94	3.09	3.15	3.19	3.21	3.04
	t-value			6.06	4.27	4.59	3.51	5.38	6.02	4.97	3.36	4.24	4.07
	Sig. (2-tailed)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total		517	100.0%									

Table 2 presents the measurement quality of the constructs. Specifically, the factor loading of the measurement items surpassed the 0.7 threshold, and the average variance explained (AVE) from the factor reduction process was greater than the 0.5 threshold (Carmines and Zeller, 1979; Fornell and Larcker, 1981). The constructs were internally consistent since their composite reliabilities were higher than 0.7. The constructs secure the required convergent

validity. In addition, the evidence that the correlations between the constructs are less than the square root of the AVE supports the discriminant validity (Fornell and Larcker, 1981; Nunnally and Bernstein, 1994).

Table 2:- Convergent and Discriminant Validity.

	Discriminant Validity										Convergent Validity				Descriptive	
	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	TVE	KMO	Alpha	Factor Loading	Mean	Std Dev.
V1	0.94										0.89	0.83	0.96	0.93-0.95	3.44	0.9
V2	0.76	0.95									0.91	0.88	0.97	0.951-0.954	3.47	0.91
V3	0.79	0.68	0.94								0.88	0.73	0.93	0.9-0.95	3.34	0.95
V4	0.72	0.69	0.66	0.94							0.89	0.77	0.94	0.94-0.95	3.54	0.88
V5	0.74	0.70	0.70	0.56	0.96						0.92	0.77	0.96	0.95-0.97	3.17	1.06
V6	0.77	0.72	0.73	0.66	0.77	0.94					0.88	0.91	0.97	0.90-0.95	3.32	1.01
V7	0.77	0.73	0.73	0.68	0.73	0.76	0.95				0.9	0.92	0.97	0.94-0.96	3.34	0.95
V8	0.66	0.66	0.64	0.58	0.73	0.67	0.70	0.96			0.92	0.78	0.95	0.95-0.96	3.33	1.02
V9	0.78	0.73	0.73	0.68	0.71	0.72	0.75	0.71	0.93		0.87	0.76	0.92	0.93-0.94	3.36	0.92
V10	0.68	0.62	0.62	0.53	0.77	0.68	0.66	0.77	0.67	0.93	0.86	0.84	0.94	0.91-0.94	3.2	1.03

Note: V1 = Consumer trust, V2 = Enjoyment, V3 = Social value, V4 = System and service quality, V5 = Addiction, V6 = Flow experience, V7 = Consumer loyalty, V8 = Compulsive buying, V9 = Consumer innovativeness, and V9 = Consumer compulsive buying tendency.

The computed SEM is given in Fig. 2, with a solid ability to explain the logic of the consumer behaviors of live-streaming e-commerce, as evidenced by R-squared ranging between 0.65 to 0.75. The incremental and absolute fit indexes satisfy the threshold requirement (Hair et al., 1998): $\chi^2/df = 3.759$, $p = 0.00$, $df = 380$, $NFI = 0.938$, $RFI = 0.929$, $IFI = 0.954$, $TLI = 0.947$, $CFI = 0.954$, $RMSEA = 0.073$ (< 0.08 threshold). For large sample sizes, such as 500, and with maximum likelihood estimation, p is usually less than 0.05 (Hair et al., 2006).

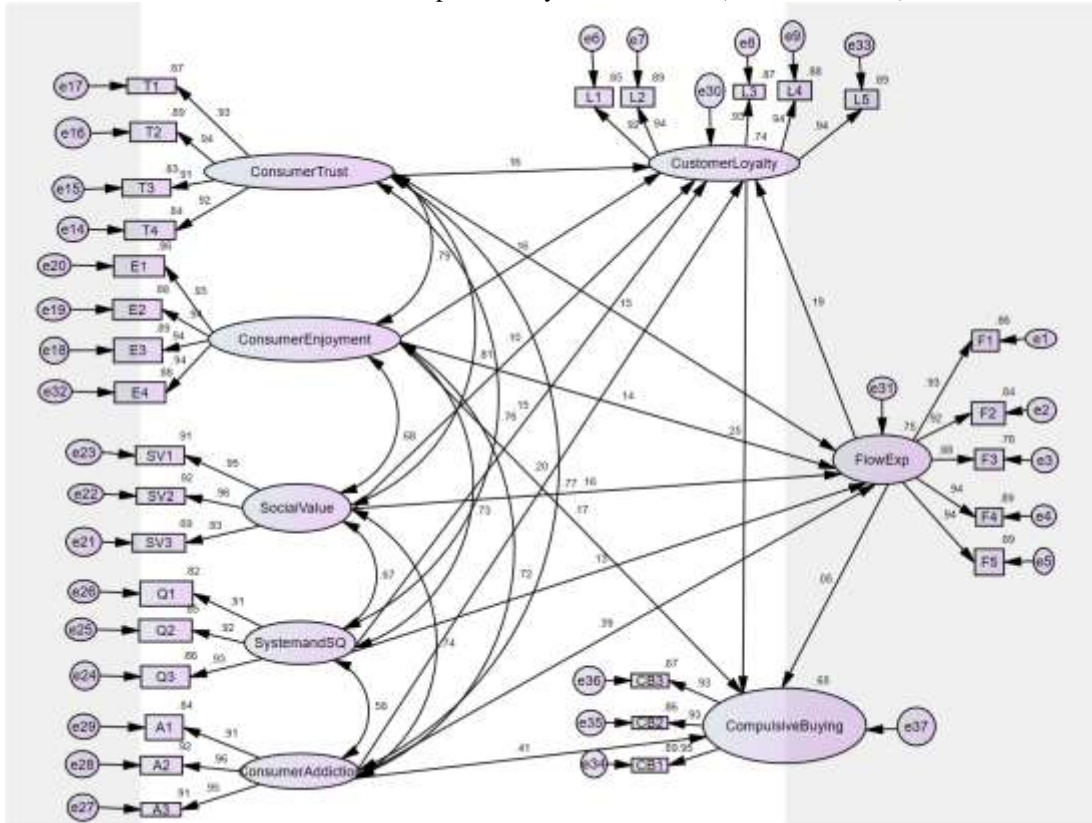


Fig. 2:- The Computed SEM Model.

Hypotheses derived in the literature review are supported, except for the flow state, in which its positive direct effect on compulsive buying is generally weak and overtaken by the moderating functions of consumer innovativeness and compulsive buying tendency. Table 3 supports the moderating role of consumer innovativeness and not compulsive buying tendency.

Table 3:- Hypotheses Support.

Theory	H	X1	→	X2	Path Coefficient	t-Value	Sig.	Remark
Flow-Theory	H1	Flow		Loyalty	0.19	4.41	0.000	Supported
	H2a	Trust		Flow	0.15	3.81	0.000	Supported
	H2b	Trust		Loyalty	0.16	2.98	0.003	Supported
	H3a	Enjoyment		Flow	0.14	3.31	0.001	Supported
	H3b	Enjoyment		Loyalty	0.16	3.89	0.000	Supported
Addiction	H4a	Addiction		Flow	0.39	9.35	0.000	Supported
	H4b	Addiction		Loyalty	0.2	4.58	0.000	Supported
	H4c	Addiction		Compulsive Buying	0.41	8.25	0.000	Supported
Socio-Technical System Theory	H5a	Social Value		Flow	0.16	3.79	0.000	Supported
	H5b	Social Value		Loyalty	0.1	3.37	0.001	Supported
	H5c	System and Service Quality		Flow	0.13	3.44	0.001	Supported
	H5d	System and Service Quality		Loyalty	0.15	3.52	0.000	Supported
Compulsive Buying	H6	Enjoyment		Compulsive Buying	0.17	3.45	0.001	Supported
	H7	Flow		Compulsive Buying	0.05	1.63	0.103	Not Supported. Moderation (see H9, H10)
	H8	Loyalty		Compulsive Buying	0.25	4.88	0.000	Supported
Moderation	H9	Flow*Consumer Innovativeness		Compulsive Buying	0.209	2.95	0.003	Supported
	H10	Flow*Compulsive Buying Tendency		Compulsive Buying	0.009	0.14	0.890	Not Supported

The significant moderating effect of consumer innovativeness in influencing the relationship between the flow experience of consumers and loyalty is evident in Fig. 3.

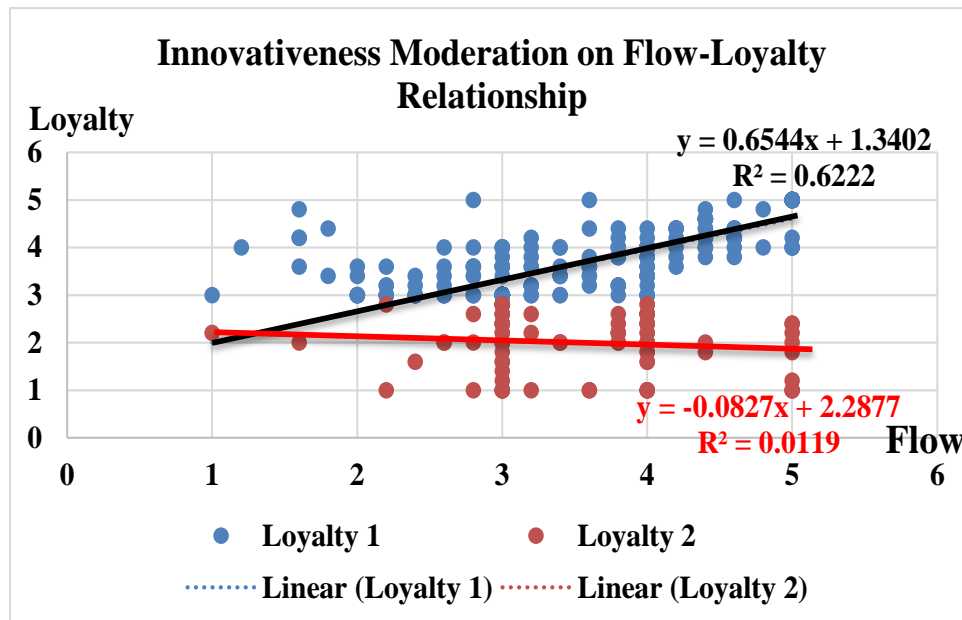


Fig. 3:- The Moderating Effect of Consumer Innovativeness.

Discussion:-

Since there is a growing desire for materialism (Xu, 2008) and increased product availability and accessibility through offline and online retail channels, compulsive shopping is emerging in consumer behavior. Still, it is

understudied (Tarka and Kukar-Kinney, 2022). Ridgway et al. (2008) and Mason et al. (2022) note that compulsive buying might not entirely imply a loss of impulse control over obsessive shopping-related thoughts and feelings. Their findings align with this study as evidenced by the loyalty and addiction base of compulsive buying, implying both planned and unplanned characteristics and rational versus impulsiveness in purchasing.

The flow state of consumers has been shown not to have a significant and direct effect on compulsive buying, but its role in customer loyalty is essential. This study shows that the flow state can be explained by flow theory, the socio-technical system theory, and consumer addiction to live-streaming e-commerce. Based on the flow theory of Csikszentmihalyi's publications (1975; 1990a, b; 1991; 1996; 2003; 2022), this study advocates that trust and enjoyment are the two critical drivers for a flow state to arise, serving as antidotes to anxiety and boredom, respectively. Both anxiety and boredom prevent flow experiences from arising (Csikszentmihalyi, 1975, 1991, 1996). The rationale is as follows: Trust shifts consumers from a sense of disequilibrium (anxiety, Turner, 1988; Stephan and Stephan, 1985) to equilibrium. As an antidote to anxiety and uncertainty, the trust-based factor in shaping flow experience will find applicable theories of uncertainty reduction and signaling (Lu and Chen, 2021). Uncertainty refers to the degree to which future environmental conditions cannot be precisely forecast for various reasons (Pleasant et al., 2022; Pfeffer and Salancik, 1978). When ambiguity lessens, trust develops (Melewar et al., 2017). Trust has both cognitive (e.g., positive assessment of the quality of goods, Ozdemir et al., 2020) and affective components (e.g., displaying genuine care and concern, Ozdemir et al., 2020), leading to a linkage to signaling theory (Dirks and Ferrin, 2002).

In the socio-technical aspect, the significant role of social values on flow state and loyalty implies the existence of parasocial interaction in live-streaming e-commerce, as also reported in Rungruangit (2022).

Live-streaming e-commerce addiction implies an incentive sensitization. It can result in a bias of attentional processing toward live-streaming e-commerce stimuli. With addictive patterns, consumers repeatedly expose themselves to live-streaming e-commerce events, which depicts a psychological mechanism to induce purchase. Depending on the situation, an enhanced incentive salience may appear in behavior through implicit (as unconscious desire) or explicit (as conscious seeking) mechanisms (Robinson and Berridge, 2008: 3137), which provides the logic supporting loyalty and addiction as predictors of compulsive buying.

According to the comparative t-test, the "Mushroom" platform draws the most favorable perceptions. Usage profiles deliver loyalty attributes: The higher the frequency of weekly live-streaming shopping participation, the more favorable the perceptions of the constructs, with correlations between 0.26 and 0.35; monthly expense budget is another significant factor, with correlations ranging between 0.11 and 0.19, sig. 0.01 (2-tailed). Consumers who have had no negative experience with the live-streaming show more favorable perceptions.

Theoretical Implication

There are many aspects of theoretical implications.

First, the study confirms the practical value and validity of flow and socio-technical system theory in a live-streaming e-commerce application. Socio-technical system theory expands the widely used theory of technology acceptance model (TAM) for expanding potential adopters (Lee and Wong, 2021). Live-streaming e-commerce shines through characteristics of interactivity, simultaneity, and social presence (Gao et al., 2021). Without the system support and service quality, as shown by Wang et al. (2022), it would be impossible to deliver the social characteristics. As shown in this study, the combined system, service quality, and social value provide a value-enabled socio-technical platform for activating the flow state of consumers and their loyalty to live-streaming e-commerce. The socio-technical weights to flow state and loyalty are equally significant, as evidenced by ranges of the structural equation model (SEM)'s path coefficients between 0.1 and 0.16.

Second, though the socio-technical system theory is widely used to understand consumer behaviors in live-streaming e-commerce, the extant literature needs an emphasis on the social value aspect. Social value is impact-oriented and reflects the significant role of a social atmosphere and the ability of socio-technical design to stimulate the interests and flow experience of consumers, leading to absorption. Thus, many socio-related theories provide the base of logic to explain social value and its predictive capacity for flow and loyalty. Examples of socio-related theories include the following: social impact theory (which manifests the role of social presence), servicescape theory (which reinforces the role of the social atmosphere), theory of resonance and stimulus-organism-response (that stresses

stimulating effect on consumers' socio-psychological condition), social identity theory (the role of co-experience and identity congruence among the consumers and viewers of the live-streaming e-commerce), attachment theory (e.g., social attachment of consumers), and consumer value theory (e.g., social value) (Xie et al., 2022).

Third, there are significant antecedents to and mediating functions of customer loyalty. Customer loyalty is a critical indicator for judging the sustainable performance of organizations (Ayodeji, Rjoub, and Ozgit, 2022) and the core of brand equity (Aaker, 1991). This study indicates that customer loyalty can be influenced through a robust base of flow theory, socio-technical system theory, and addiction. In addition, the indirect positive effect of consumers' flow experience on compulsive buying via consumer loyalty is more important than its direct effect on compulsive buying.

Fourth, little attention has been paid to the moderating role of consumer innovativeness and compulsive buying tendency on the relationship between the flow state of consumers and loyalty. Innovativeness is a personal trait. Being moved by their innovativeness, consumers often exhibit a higher level of fun and enjoyment in engaging in technology or technological products, leading to absorption and continuing adoption (Alalwan et al., 2018; Pereira and Tam, 2021). Thus, consumer innovativeness and compulsive buying tendency have a significant moderating stimulation effect on flow arousing and its influence on loyalty level.

Practical Implication

There are also numerous practical implications.

First, the empirical support for the socio-technical system theory shows that consumer behavior should be guided by notions of social capital, social exchange, and trust, sharing the views of Schilke and Cook (2015), McEvily et al. (2017), and Irun et al. (2020). Thus, social context is an essential stimulant in a socio-commercial environment like live streaming e-commerce.

Second, this study shows that consumer innovativeness and compulsive buying tendency play a significant moderating function in leveraging the level of flow state of consumers to influence loyalty. Accordingly, e-commerce platforms and live-streaming e-commerce businesses should exploit these unique consumer cognitive styles and involvements and derive appropriate marketing strategies (e.g., interactive strategies and loyalty schemes, Wang, Pallister, and Foxall, 2006) to enhance loyalty.

Conclusions:-

Flow state has characteristics of a sense of concentration, deep involvement, and a sense of being in control (Kazancoglu and Demir, 2021). Anchors or hosts of live-streaming shopping, who would like the consumers to be engrossed in the temporal and action cycle of the event by feeling motivated in moments of pleasure, can focus on the consumer's flow experiences. Accordingly, this study draws on the flow theory and socio-technical system theory as its foundation to induce the flow state, influencing loyalty and compulsive buying. The theoretical model shares a stimulus-organism-response (SOR) structure. The response shows two stages – loyalty and compulsive buying. The stimuli are conceptualized based on flow theory, socio-technical systems theory, and addiction, and the organic state is flow-state driven.

Limitation and Further Research

While this study investigates and validates the role of consumer enjoyment in both flow state and loyalty, and thus, compulsive buying, it does not drill into the stimulating factors that can cause enjoyment. Further research can employ an interpretive and deduction-based method to examine the enjoyment drivers. For instance, Horvath and Adiguzel (2018) collected data from women shopping at malls in two Western developed markets (the Netherlands and Germany). They provided empirical support for numerous enjoyment drivers, such as gratification seeking, idea shopping, adventure shopping, social shopping, role play, and value shopping. The significance of social value highlights the role of value-based marketing. Further research can explore other facets of values, such as utilitarian, hedonic, and symbolic values, as advocated in consumer value theory (Xie et al., 2022), to increase product sales through live-streaming e-commerce.

The current study does not consider the types of products and services in the survey. Nevertheless, recent research has spotted some unsuccessful live-streaming e-commerce, which may be attributable to strategies not considering

product attributes (Wang, Kandampully, and Wang, 2022). Thus, further research can broaden the survey with different product choices.

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