Research Article

Value Co-creation Perspective: Research on Consumers′ Willingness to Purchase AI Children′s Companion Products Based on the Push-Pull-Mooring Model

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Based on the Push-Pull-Mooring (PPM) model, this study integrates the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) and the value co-creation theory to construct a "push-pull-mooring" theoretical framework. The purpose is to explore the influencing mechanism of consumers' willingness to purchase AI children's companion products. A questionnaire survey was adopted, targeting parents of kindergarten and primary and secondary school students in first-tier cities such as Beijing and Shanghai. Partial Least Squares Structural Equation Modeling was conducted using Smart PLS 4.0 software to test the direct effects of key factors and the moderating effect of AI co-creation ability. The findings indicate that performance expectancy, hedonic motivation, and social influence, as pull factors, have a significant positive impact on purchase intention; ethical and privacy concerns, as push factors, have a significant negative impact on purchase intention; AI co-creation ability not only directly promotes purchase intention but also significantly positively moderates the relationship between pull factors and purchase intention, and negatively moderates the relationship between push factors and purchase intention. This study verifies the action paths of factors such as AI co-creation ability, broadens the theoretical perspective of traditional technology acceptance models, and provides empirical support for AI children's product enterprises in product design and marketing strategies.

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1. Introduction

Against the backdrop of the intelligent era, AI children's companion products, as a frontier intersection of "AI + education" and intelligent manufacturing, have rapidly moved from concept to market. Such products are not only a key medium for integrating artificial intelligence technology into household consumption scenarios but also a model for China's manufacturing industry to stride towards the top of the value chain. Therefore, conducting a systematic study on the consumption-driven mechanism of AI children's companion products has urgent practical value in promoting the steady development of the AI industry and stimulating consumption potential.

From the upgrading and replacement of old and new products, it can be seen that what the market values has quietly changed. Early intelligent toys had core competitiveness limited to voice interaction through preset programs; however, the new generation of AI companion dolls has transformed from rigid tools into partners that can create together with humans, achieving a paradigmatic leap from "instrumentality" to "co-creation". Its key feature is opening up the authority to adjust or train functions to parents, allowing them to set training goals and interactive content according to their children's different needs and "co-create" products together. This design breaks the traditional one-way value delivery model from "enterprise to user", builds a positive interactive ecosystem centered on value co-creation, thereby significantly enhancing user stickiness and product added value [1].

However, the way artificial intelligence enters the private space of families and deeply integrates into human life has also aroused many ethical questions and social concerns. The focus of the controversy lies in the worry that children's excessive interaction with AI may affect their mental health, social ability development, and parent-child relationships [2]; at the same time, potential risks such as data privacy leakage and the uncertainty of algorithmic decisions have further deepened parents' safety concerns. These ethical and privacy concerns have become key obstacles to product promotion [3] and are also challenges that need to be addressed in the innovation process.

Although many studies have explored the acceptance of AI educational products from different perspectives, academic understanding remains fragmented. Specifically, in studies on people's acceptance of new technologies, mature models such as UTAUT2 are often used to analyze the attractiveness brought by factors such as performance expectancy and social influence [4]. Research on ethics and privacy security only focuses on the push effect, lacking a complete framework that integrates push factors, pull factors, and consumers' own factors. Notably, although the academic community

generally recognizes that value co-creation is a key way to improve user experience, existing studies have failed to fully answer how it functions in consumers' decision-making. Is value co-creation a key factor directly driving consumers to purchase, or does it affect the action path of other factors in the PPM model on purchase intention through a moderating role [5]? This theoretical gap leads to an incomplete understanding of the decision-making logic of consumers of AI children's products.

To fill the above research gaps, this study builds a comprehensive theoretical framework based on the Push-Pull-Mooring model. Specifically, this study uses the UTAUT2 model to analyze pull factors such as performance expectancy and social influence, regards ethical and privacy concerns as push factors, takes AI co-creation ability as the mooring factor, places value co-creation theory in a key position, and explores the operational path of AI co-creation ability as a moderating variable. This study aims to comprehensively analyze the multiple paths and boundary conditions affecting parents' willingness to purchase AI children's companion products, hoping to provide scientific decision-making references for enterprises in product innovation, risk management, and precise marketing, and help the industry achieve healthy and sustainable high-quality development while meeting the people's pursuit of a better life.

2. Literature Review

2.1. Expansion of UTAUT2

In the field of consumer technology acceptance research, the Unified theory of acceptance and use of technology model (UTAUT2) has established a benchmark model that can scientifically explain individual usage intentions and behaviors by systematically integrating multiple classic theories [4]. This model includes many key elements—performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, etc.—providing a scientific research method for analyzing the driving mechanism of new technologies at the consumer end.

This study chooses UTAUT2 as the theoretical basis mainly because AI children's companion products are essentially complex information technologies that penetrate into family life. Whether consumers accept them largely depends on their comprehensive consideration of technical usefulness, social norms, and emotional returns. However, when applying the classic UTAUT2 model to such emerging technological products that are both educational and companionable, some concepts in the model need to be adjusted according to specific situations. Therefore, this study focuses on three factors in the model

that are most closely related to family consumption decisions: performance expectancy, hedonic motivation, and social influence [6], so as to more accurately capture the positive driving sources of consumers' willingness to purchase AI children's products.

2.2. Decision-Making behavior and Push-Pull-Mooring Theory

The Push-Pull-Mooring model (PPM) originated from research in the field of population migration. Its key advantage is that it can simultaneously explain the push factors that drive individuals to leave, the pull factors that attract individuals to move, and the mooring factors that affect the intensity of decision-making [7]. Parents' decision to purchase AI companion products for their children is essentially a behavioral transformation decision process from the traditional parent-child interaction model to a new interactive model deeply integrated with AI technology. Therefore, the PPM framework provides an appropriate theoretical carrier for comprehensively analyzing the driving forces and resistances in this decision-making process.

In this study, the pull factors include performance expectancy, hedonic motivation, and social influence in the UTAUT2 model, which together constitute the attractiveness of new technologies. The push factors refer to the negative forces that hinder purchase, reflected in parents' anxiety about ethical relationships [8] and concerns about privacy security[9]. The traditional PPM model has great limitations in explaining AI products that allow users to deeply participate in co-creation, as it cannot fully cover the moderating role of users' co-creation ability. This theoretical gap greatly limits the explanatory power of the traditional model for current products and consumers' purchase decisions.

2.3. Application of Co-creation Theory

The value co-creation theory breaks the traditional concept of one-way value transmission and advocates that value is jointly created by consumers and enterprises in the process of interaction and use [1]. In the interactive scenario of AI children's products, allowing parents to train AI models is a specific manifestation of the value co-creation concept, which also transforms parents from passive value recipients into active co-creators of value.

Although the importance of value co-creation has been widely recognized, there is still a key theoretical blind spot in current relevant academic research: most studies regard co-creation as an outcome variable or antecedent variable, but ignore its key role as a higher-order variable in purchase decisions. Specifically, in consumption decisions, value co-creation is more likely to act as a deep psychological

framework, reshaping consumers' ways of weighing information. Based on this, this study transforms its core concept into an important mooring factor named AI co-creation ability.

This study argues that a high level of co-creation ability can prompt parents' decision-making logic to shift from passive consumers to active co-creators. In this case, they will pay more attention to the plasticity of the product, and believe that their participation can amplify the positive effects of pull factors and weaken the negative effects of push factors [10]. AI literacy lays the necessary foundation of ability and confidence for such co-creation behaviors, preventing parents from giving up participation due to unfamiliarity with technology [11]. Through this theoretical integration, this study intends to clarify that value co-creation is not merely a "functional selling point" to attract consumers, but a core moderating mechanism that can profoundly reshape their entire decision-making calculation process.

In summary, although existing studies have separately verified the attractiveness effect of the UTAUT2 model and the explanatory power of the PPM framework, they have not fully clarified the key role of value co-creation in consumption decisions, especially its systematic moderating role. This study introduces the value co-creation theory as a higher-level integration perspective, aiming to explore: how does AI co-creation ability affect the impact of push and pull factors on parents' purchase intention? Can a high co-creation scenario make parents feel more capable and willing to participate, thereby enhancing their purchase intention? It analyzes the psychological mechanism of value co-creation driving technology internalization.

3. Theoretical Model and Research Hypotheses

3.1. Theoretical Model

This study takes the Push-Pull-Mooring model (PPM) as the overall framework, integrates the Unified Theory of Acceptance and Use of Technology (UTAUT2) to explain pull factors, introduces the value co-creation theory to clarify key mooring factors, and creatively builds a model for explaining parents' willingness to purchase AI children's companion products. This model systematically explains the synergistic mechanism of three types of factors: pull factors, push factors, and mooring factors. As positive driving variables, pull factors include performance expectancy, hedonic motivation, and social influence, reflecting the multi-dimensional explanatory power of the UTAUT2 model for technological attractiveness. As negative hindering variables, push factors focus on ethical and privacy concerns, reflecting risk perception in consumption decisions. As a key mooring factor, AI co-creation ability

originates from the value co-creation theory, which not only directly drives purchase intention but also deeply moderates the degree of association between push/pull factors and final decisions. The model integrates consumers' co-creation ability into the decision-making framework, which not only responds to the demand for user initiative in the field of intelligent consumption but also provides practical guidance for enterprises on how to empower users and break market limitations.

3.2. Research Hypotheses

This study innovatively constructs a model of the influencing mechanism of consumers' willingness to purchase AI children's companion products, proposes the following research hypotheses, and conducts empirical research, as shown in Figure 1.

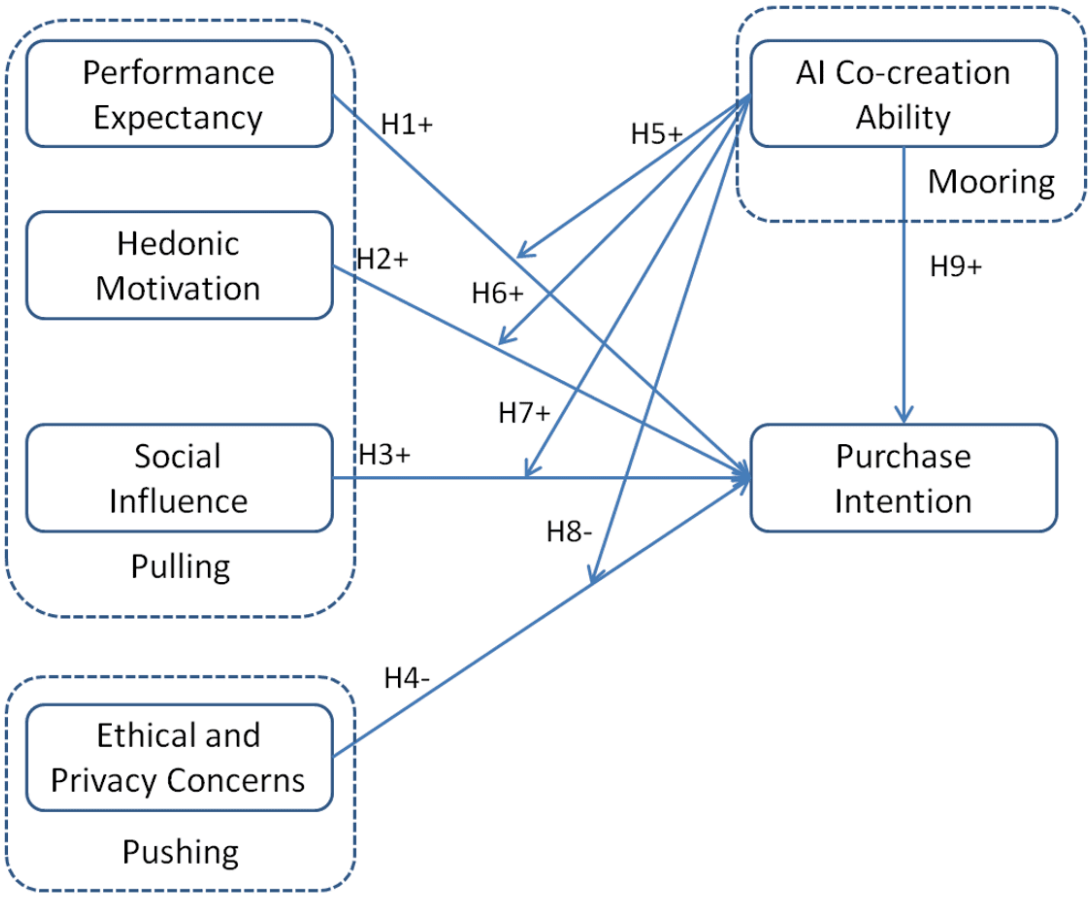

Figure 1. Research Model

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Performance expectancy refers to consumers′ expectation that a product can improve work performance [4]. When placed in the scenario of family parenting, performance expectancy is reflected in parents′ expectation that AI children′s companion products can improve their children′s knowledge level, promote habit formation, or provide high-quality companionship. For parents, AI children′s companion products can partially replace parents′ interaction with their children, which can not only make up for the regret of being unable to accompany their children all the time due to work and other reasons but also provide strong help for children′s growth and learning with their highly logical answers and extensive knowledge. If parents believe that this product can achieve core parenting goals, this positive perception of practical value forms a key rational basis for purchase decisions.

H1: Performance expectancy has a significant positive impact on purchase intention.

Hedonic motivation refers to consumers′ intrinsic need to obtain pleasure, fun, and emotional satisfaction in the process of product use [6]. In the field of AI children′s product consumption, it specifically refers to parents′ expectation that both their children and they can obtain a pleasant experience from interacting with the product. If parents predict that the built-in narrative, game, and dialogue functions of the product can interest their children and bring positive emotional interaction experiences, such hedonic expectations will become a key factor in enhancing purchase intention.

H2: Hedonic motivation has a significant positive impact on purchase intention.

Social influence refers to the influence of the attitudes and behavioral demonstrations of reference groups on individuals when making decisions [4]. If parents observe that people they care about (such as relatives and friends, parenting experts, or other parents) hold a positive attitude towards AI children′s products or have actually purchased and used them, consumers are likely to trust and choose such products. In fact, this influence stems from people′s herding psychology and desire for social recognition. Parents also hope to gain social approval and reduce decision uncertainty, so social influence will subtly affect their purchase intention.

H3: Social influence has a significant positive impact on purchase intention.

Ethical and privacy concerns here refer to parents′ worry that AI products may have a negative impact on children′s growth, as well as the risk of personal data being misused or leaked. Ethical anxiety includes the worry that AI will weaken the parent-child emotional bond, hinder the development of children′s real social abilities, or convey inappropriate values. Privacy security concerns mainly lie in whether the product will over-collect sensitive data such as children′s personal information, and how these data are

stored and used. These concerns constitute a strong "push" force hindering purchase. When parents frequently see news about "AI monitoring" or "trafficking of children's data", such negative reports may form a strong push force hindering purchase, which may greatly weaken or even offset the pull force of the product. It can be inferred that the deeper the ethical and privacy concerns, the lower the purchase intention [9].

H4: Ethical and privacy concerns have a significant negative impact on purchase intention.

The value co-creation concept points out that consumers' participation in co-creation can significantly enhance their perceived control and value recognition[1]. AI co-creation ability here refers to parents' perceived ability to participate in adjusting and training AI products to meet their children's personalized needs. When parents have a high level of co-creation ability, they are not satisfied with the standard functions of the product before purchase, but will actively imagine how to improve product efficiency through personalized training. Parents not only expect the product to teach basic knowledge but also believe that they can set it to let AI focus on tutoring their children in certain learning content. Precisely because parents believe that their participation can greatly improve the practical value of the product, this perception of plasticity will strengthen the connection between performance expectancy and purchase intention.

H5: AI co-creation ability positively moderates the relationship between performance expectancy and purchase intention.

A high level of co-creation ability is reflected in parents' not passively accepting the preset entertainment functions of the product, but being able to actively create or customize a variety of hedonic scenarios. When parents perceive that they can let AI robots develop more and more personalized hedonic functions, their expectation of the hedonic experience that the product can bring will be stronger. This perception of transforming "hedonism" from an established product attribute into an extensible creation process makes parents have a stronger and more lasting expectation of the emotional returns that the product can provide, thereby enhancing the driving effect of hedonic motivation on purchase intention.

H6: AI co-creation ability positively moderates the relationship between hedonic motivation and purchase intention.

Parents with strong co-creation ability generally have a deeper understanding and judgment of technical products. When receiving external social influence, they are more willing to regard it as reference information rather than absolute follow-up, and will evaluate whether the product can really meet their

personalized needs through their own co-creation ability. Once they analyze and believe that the AI children's companion product is indeed suitable for them, their purchase intention will be stronger. This internalized decision-making process makes it easier for social influence to be transformed into a firm purchase intention.

H7: AI co-creation ability positively moderates the relationship between social influence and purchase intention.

Sense of control is a key psychological mechanism to alleviate the perception of technical risks [10]. Parents with a high level of co-creation ability believe that they can effectively control and prevent potential ethical and privacy security risks by actively modifying privacy settings, supervising interaction records, and other methods. This perceived sense of control can buffer the psychological threat caused by ethical and privacy concerns, reducing their negative impact on purchase intention.

H8: AI co-creation ability negatively moderates the relationship between ethical and privacy concerns and purchase intention.

Self-determination theory indicates that individuals' pursuit of autonomy is a basic psychological need [12]. What AI co-creation ability endows parents with is precisely the autonomous control right to create their children's companionship and education process. The value proposition of "being able to participate in customization" itself can directly meet parents' internal demand for personalized parenting, thereby enhancing consumers' purchase intention, even without relying on other factors.

H9: AI co-creation ability has a significant positive impact on purchase intention.

4. Methodology

This study takes parents of kindergarten and primary and secondary school students in cities of Beijing and Shanghai as the research objects. Their typical characteristics are mainly reflected in three aspects: first, as a key part of the digital natives, parents in big cities have a high sensitivity and acceptance of artificial intelligence technology, which creates an ideal sample basis for exploring the consumption decision-making mechanism of AI children's products [3]. In addition, most of these families face the pressure of high work intensity and fierce educational competition, and have an obvious demand for intelligent products that can improve parenting efficiency and quality [11]. Finally, it is crucial that the group of primary and secondary school parents, especially those with two children, already have rich parenting experience. Their value evaluation of product functions is more systematic, and their

evaluation of risks such as ethics and privacy security is more prudent, which provides sufficient conditions for studying the complex decision-making mechanism under the push-pull-mooring framework [7].

In terms of research methods, this study adopts a deeply focused single-group sampling strategy, distributing questionnaires through professional parent communities and educational platforms. Although no multi-location comparison is implemented, this design effectively avoids the impact of external variables such as regional cultural differences and economic development levels. By selecting a group of parents in big cities who are typical in both technical acceptance and parenting needs, the study can focus on analyzing the motivation-cognition-intention transmission path in consumption decisions while controlling environmental variables. This sampling method with strong representativeness and high homogeneity can more accurately reveal the key mechanisms affecting consumption intention compared with broad-spectrum sampling [7].

Data collection is carried out through a professional questionnaire platform, measured using a Likert 7-point scale. The scale design strictly follows psychometric principles, and all measurement items of the constructs are derived from mature scales: the measurement of performance expectancy and social influence is based on the research of Venkatesh et al. [4]; the items of hedonic motivation are borrowed from the scale developed by Van der Heijden et al. [13]; the measurement of ethical and privacy concerns refers to the research results of Borenstein, Smith and other scholars[8][14]; the items of AI co-creation ability integrate Agarwal's personal innovativeness scale and Nambisan's value co-creation scale[15][16]; the measurement of purchase intention adopts the classic scale of Dodds et al. [17]. The specific items are shown in Table 1.

Measurement	Source
Performance Expectancy（PE）	
PE1 AI children's products can effectively accompany children.	Venkatesh et al., 2003[18]; Davis, 1989[19];
PE2 AI children's companion products can help children learn knowledge.	
PE3 AI children's companion products can partially reduce parenting pressure.	
Hedonic Motivation（HM）	
HM1 Children like to interact with AI companion products.	Venkatesh et al., 2012[4]; Van der Heijden, 2004[13];
HM2 AI children's companion products can bring happiness to children.	
HM3 AI children's companion products can provide a variety of interesting functions.	
Social Influence（SI）	
SI1 People around me are using and supporting me to use AI children's companion products.	Venkatesh et al., 2003[18]; Ajzen, 1991[20]; MacKenzie & Lutz, 1989[21]
SI2 My social circle recognizes AI children's companion products.	
SI3 I often see various advertisements for AI children's companion products.	
Ethical and Privacy Concerns	
EPC1 Children's excessive reliance on AI companions may weaken their ability to socialize with real people.	Borenstein & Arkin, 2016[8]; Smith et al., 2011[14];
EPC2 AI children's companion products may collect family privacy.	
EPC3 AI children's companion products may reduce children's dependence on their parents	
AICo-creation Ability AI（AICC）	

Measurement	Source
AICC1 AICC1 Among peers, I always like to be the first to try new things.	Ramaswamy, 2004[1] Agarwal & Prasad, 1998[15]; Nambisan et al., 2019[16]; Prahalad&
AICC2 I am curious about AI children's companion products and willing to explore their new functions.	
AICC3 I am willing to participate in training AI to achieve personalized companionship for my children.	
Purchase Intention（PI）	
PI1 I have a strong willingness to purchase AI children's companion products.	Venkatesh et al., 2012[4]; Dodds et al., 1991[17];
PI2 I will recommend AI children's companion products to people around me.	
PI3 I will give priority to children's products with AI companion functions.	

Table 1. Variables and Measurement Items

4.1. Data Sources and Research Methods

All scales in this study have passed reliability and validity tests, with Cronbach's α coefficients higher than 0.8, indicating that the measurement tools have good internal consistency. This study uses Structural Equation Modeling (SEM) to test theoretical hypotheses, specifically implementing Partial Least Squares Structural Equation Modeling (PLS-SEM) with Smart PLS 4.0 software. The advantage of this method is that it can effectively handle formative indicators and moderating effects in complex models, providing an appropriate analytical tool for verifying the theoretical model of this study.

4.2. Data Analysis

4.2.1. Data Sample Analysis

A total of 605 questionnaires were collected through the online questionnaire platform. After rigorous data cleaning steps, 187 invalid questionnaires with excessively short response time, identical options,

and significant logical conflicts were removed, and finally 418 valid questionnaires were obtained, with an effective recovery rate of 69.1%. The distribution of the sample in terms of demographic characteristics is shown in Table 2. In terms of family roles, mothers account for the largest proportion at 70.1%, which is consistent with the actual situation that mothers generally take on the main parenting responsibilities in family education; in terms of age composition, the majority are middle-aged and young parents, with the 31-40 age group accounting for the largest proportion at 39.0%. Parents in this age group are in a critical stage of parenting and mostly have high digital literacy; in terms of education level, 59.8% of the respondents have a college degree or above, indicating that the overall education level of the sample group is relatively high; the distribution of annual family income is relatively balanced, with the 30,000-40,000 US dollars range accounting for the highest proportion at 44.7%, which is consistent with the characteristics of middle-income families in first-tier cities; from the perspective of product use experience, 59.3% of users have used the product for less than 6 months, which means that AI children's companion products are still in the initial stage of market promotion. Overall, the sample structure has good representativeness and rationality, and can provide solid data support for subsequent hypothesis testing.

Category	Subcategory	Frequency (n)	Percentage (%)
Family Role	Mother	293	70.1
	Father	125	29.9
Age	20-30 years old	157	37.6
	31-40 years old	163	39.0
	41-50 years old	58	13.9
	Over 51 years old	40	9.6
Education Level	High school or below	168	40.2
	College or undergraduate	190	45.5
	Master's degree	47	11.2
	Doctoral degree	13	3.1
Annual Family Income (US dollar)	Below 30,000 yuan	126	30.2
	30,000-40,000	187	44.7
	40,000-60,000	74	17.7
	Above 60,000	31	7.4
Usage Duration of AI Children's Companion Products	Less than 3 months	121	28.9
	3-6 months	127	30.4
	6-12 months	87	20.8
	More than 12 months	83	19.9

Table 2. Demographic Data

4.2.2. Measurement Model Test

To ensure the reliability and validity of the theoretical model, this study conducts reliability and validity tests on the measurement model using Smart PLS 4.0 software. As can be seen from Table 3, the Cronbach's α coefficients and composite reliability (rho_a and rho_c) of all constructs are greater than the

ideal critical value of 0.7, and the Average Variance Extracted (AVE) all exceed 0.85, which is much higher than the minimum standard of 0.5. These indicators strongly indicate that the measurement model has good internal consistency and convergent validity, and the measurement items of each construct can effectively reflect its theoretical connotation.

In terms of discriminant validity test, this study adopts the Heterotrait-Monotrait Ratio (HTMT) criterion for verification. From the HTMT matrix presented in Table 4, the maximum value is 0.386 and the minimum value is 0.010. The HTMT values between all constructs are significantly lower than the critical standard of 0.85. This result effectively verifies that there is clear discriminant validity between each construct of the model, ensuring that subsequent path analysis will not be affected by multicollinearity problems.

The overall reliability and validity test results show that the measurement model of this study not only ensures the accuracy of the measurement of each construct but also verifies the rationality of the theoretical framework, laying a solid methodological foundation for subsequent structural model analysis and hypothesis testing. These test results comply with the PLS-SEM analysis criteria, proving that the quality of the measurement tools meets the research norms.

Construct	Cronbach's alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
AICC	0.992	0.993	0.995	0.985
HM	0.982	0.983	0.988	0.966
EPC	0.983	0.986	0.988	0.966
SI	0.989	0.989	0.992	0.978
PE	0.986	0.990	0.991	0.973
PI	0.988	0.991	0.992	0.977

Table 3. Reliability and Validity Analysis

Construct	AICC	HM	EPC	SI	PE	PI	AICC×HM	AICC×EPC	AICC×SI	AICC×PE
AICC										
HM	0.051									
EPC	0.010	0.042								
SI	0.075	0.386	0.106							
PE	0.017	0.545	0.054	0.394						
PI	0.173	0.356	0.246	0.323	0.360					
AICC×HM	0.104	0.044	0.239	0.198	0.145	0.319				
AICC×EPC	0.134	0.268	0.012	0.187	0.278	0.299	0.068			
AICC×SI	0.058	0.221	0.185	0.089	0.226	0.308	0.375	0.235		
AICC×PE	0.085	0.142	0.242	0.198	0.093	0.341	0.668	0.149	0.414	

Table 4. Discriminant Validity Analysis

4.2.3. Structural Model and Hypothesis Testing

Based on the Bootstrap sampling test results of the Partial Least Squares Structural Equation Model (PLS-SEM), the theoretical model of this study has been fully verified. As can be seen from Table 5, the T-statistics of all hypothesis paths are greater than the critical value of 1.96, and the p-values are all less than the significance level of 0.05, indicating that all 9 hypotheses proposed in the study have received statistical support.

In terms of direct effects: performance expectancy (β=0.134, t=2.590, p<0.01), hedonic motivation (β=0.136, t=2.448, p<0.05), and social influence (β=0.132, t=2.621, p<0.01) all show significant positive effects on purchase intention, and hypotheses H1, H2, and H3 are supported; ethical and privacy concerns (β=-0.138, t=3.144, p<0.01) have a significant negative effect on purchase intention, and hypothesis H4 is supported; the direct driving effect of AI co-creation ability (β=0.167, t=4.108, p<0.001) on purchase intention is also confirmed, and hypothesis H9 is supported.

In terms of moderating effects: AI co-creation ability shows a significant positive moderating effect. Specifically, AI co-creation ability significantly strengthens the effects of hedonic motivation (β=0.108, t=2.141, p<0.05), social influence (β=0.120, t=2.454, p<0.05), and performance expectancy (β=0.099, t=1.995, p<0.05) on purchase intention, and hypotheses H5, H6, and H7 are supported. At the same time, AI co-creation ability shows a significant negative moderating effect on the relationship between ethical and privacy concerns and purchase intention (β=-0.123, t=2.826, p<0.01), that is, a high level of co-creation ability can effectively alleviate the inhibitory effect of ethical and privacy concerns on purchase intention, and hypothesis H8 is supported.

The overall test results show that the push-pull-mooring theoretical framework constructed in this study has good explanatory power. AI co-creation ability not only directly drives purchase intention but also plays a key moderating role through the dual paths of strengthening positive driving factors and weakening negative hindering factors in the consumer decision-making process. The research results are shown in Figure 2.

Path	Path Coefficient	Sample Mean	Standard Deviation	T Statistics	P Value
AI co-creation ability -> Purchase intention	0.167	0.168	0.041	4.108	0.000
AI co-creation ability × Hedonic motivation -> Purchase intention	0.108	0.111	0.050	2.141	0.032
AI co-creation ability × Ethical and privacy concerns -> Purchase intention	-0.123	-0.120	0.044	2.826	0.005
AI co-creation ability × Social influence -> Purchase intention	0.120	0.119	0.049	2.454	0.014
AI co-creation ability × Performance expectancy -> Purchase intention	0.099	0.098	0.050	1.995	0.046
Hedonic motivation -> Purchase intention	0.136	0.137	0.055	2.448	0.014
Ethical and privacy concerns -> Purchase intention	-0.138	-0.140	0.044	3.144	0.002
Social influence -> Purchase intention	0.132	0.133	0.050	2.621	0.009
Performance expectancy -> Purchase intention	0.134	0.132	0.052	2.590	0.010

Table 5. Direct Effect Path Coefficients

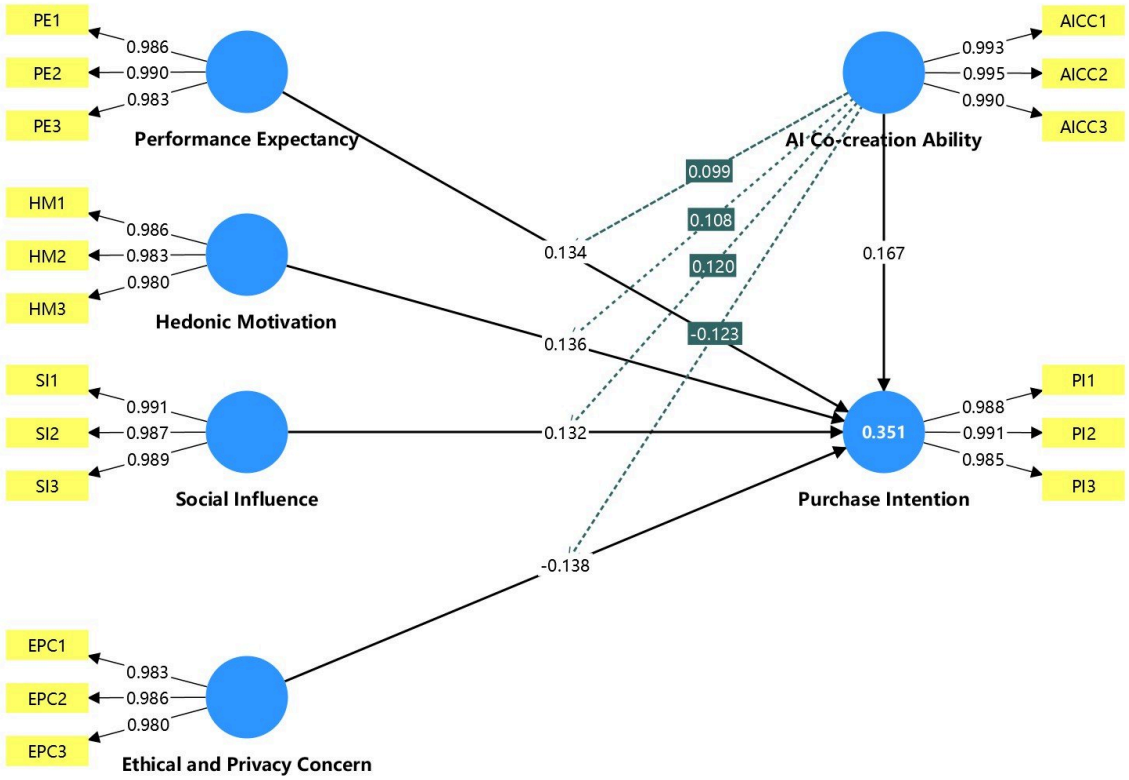

Figure 2. Research Results

5. Results and Discussion

5.1. Main Research Findings

This study comprehensively verified the influencing mechanism of consumers' willingness to purchase AI children's companion products based on the push-pull-mooring framework using structural equation modeling, and drew the following conclusions.

In the consumption decision-making of parents regarding AI children's companion products, the roles played by push and pull factors show significant differentiation. The research results show that performance expectancy (β=0.134), hedonic motivation (β=0.136), and social influence (β=0.132), as attract factors, all have significant positive effects on purchase intention; however, ethical and privacy concerns (β=−0.138), as push factors, show a significant negative effect. This finding verifies the applicability of the PPM model in the field of intelligent consumption decision-making, indicating that

consumers are indeed affected by both positive and negative factors in the process of technology adoption decisions.

AI co-creation ability presents a unique dual mechanism of action in consumption decisions. The study found that AI co-creation ability not only directly promotes purchase intention (β=0.167) but also plays a key moderating role. Specifically, AI co-creation ability significantly enhances the positive effects of performance expectancy (β=0.099), hedonic motivation (β=0.108), and social influence (β=0.120) on purchase intention, and effectively alleviates the inhibitory effect of ethical and privacy concerns (β=-0.123) on purchase intention. This finding empirically explains the possible reason why traditional marketing strategies fail to improve the conversion rate of intelligent products—the neglect of consumers' co-creation ability as a key mooring factor leads to the failure of the effects of push and pull factors to be fully exerted.

The value co-creation theory shows a deep explanatory power in consumption decisions. The study found that parents with high co-creation ability show obvious co-creator thinking characteristics in the decision-making stage: they not only pay attention to the current functions of the product but also attach great importance to the plasticity and customization space of the product. This way of thinking enables them to enhance the practical value of the product through personalized adjustment, enrich the entertainment value of the product through function extension, and reduce the potential risks of the product through technical cognition. This finding breaks the theoretical shackles of traditional technology acceptance theories that regard consumers as passive recipients, and provides a new theoretical entry point for understanding the decision-making mechanism in the era of intelligent consumption.

5.2. Theoretical Contributions

The theoretical innovation of this study lies in constructing an integrated push-pull-mooring model from the perspective of value co-creation. By verifying the moderating mechanism of AI co-creation ability between push/pull factors and purchase intention, this study successfully introduces the value co-creation theory into the field of consumption decision research, expanding the theoretical connotation of the PPM model. This integrated model is particularly suitable for explaining the adoption behavior of intelligent consumption products with high participation and high interaction, bringing a new theoretical tool for understanding the consumption decision-making mechanism in the digital intelligence era.

The study deepens the understanding of the mechanism of value co-creation. This study not only verifies the direct and moderating effects of AI co-creation ability but more importantly, reveals the psychological mechanism of its role—by empowering consumers, changing their perceived weight and response strategies to push and pull factors. This finding breaks the theoretical limitation of traditional research that regards value co-creation as a mere marketing tool, and provides a new basis for the application of dynamic capability theory in consumer behavior research. The research results show that in the scenario of intelligent product consumption, consumers' co-creation ability not only affects their usage experience but also profoundly affects their entire decision-making thinking and evaluation criteria.

In addition, this study expands the application boundary of the UTAUT2 model. Integrating the core constructs of UTAUT2 into the pull dimension of the PPM framework and verifying its applicability in the emerging consumption scenario of AI children's products provides a new idea for the evolution of technology acceptance theory in family consumption scenarios. At the same time, the study found that AI co-creation ability has a significant strengthening effect on the relationships between various constructs of UTAUT2 and purchase intention. This means that in the era of intelligent consumption, traditional technology acceptance models should incorporate consumers' initiative as a key variable, which has important enlightenment significance for improving the theoretical system of technology acceptance.

5.3. Practical Implications

Based on the research results, AI co-creation ability is a core factor affecting consumption decisions. Therefore, the study suggests that enterprises fully implement the concept of co-creation in product design. In terms of product functions, friendly custom interfaces should be provided to allow parents to adjust the behavior mode and content output of AI according to their children's characteristics and needs. For example, create personalized training modules to enable parents to set exclusive educational goals and interactive topics; build ability growth maps to intuitively show the personalized results achieved by parents through training. Such designs can effectively stimulate parents' co-creation willingness and enhance the perceived value of the product.

In response to the differentiated roles of push and pull factors, enterprises need to formulate precise marketing strategies. On the pull side, it is necessary to focus on showing how the product achieves value upgrading through co-creation—not only presenting standard functions but also emphasizing the

possibility of personalized customization; not only presenting current entertainment effects but also highlighting long-term educational significance. On the push side, it is necessary to establish transparent data management mechanisms and ethical norms, and endow parents with supervision and control rights through co-creation functions, such as setting privacy setting wizards, interaction record checks, and AI interaction mode training functions, so that parents can actively manage potential risks.

In addition, the study shows that there are significant differences in co-creation ability among parent groups with different characteristics, and it is proposed to build a hierarchical user training system. For parents with high co-creation ability, build in-depth participation channels, such as product co-creation communities and function suggestion collection activities, to transform them into loyal brand advocates; for ordinary parents, design a progressive learning path, and gradually improve their co-creation ability and participation confidence through AI training guides, personalized case sharing and other content. This differentiated training strategy can effectively expand the product's user group and enhance user stickiness.

From an industrial perspective, this study provides directional guidance for the development of AI children's products. The industry needs to establish unified technical standards and ethical norms to ensure that products effectively exert their educational and companion functions while effectively protecting children's rights and family privacy. At the same time, enterprises should strengthen technical communication and experience sharing, and work together to promote the transformation and upgrading of AI children's companion products from standardized supply to personalized co-creation, so as to achieve the steady and sustainable development of the industry.

6. Conclusions and Prospects

6.1. Research Conclusions

This study verified the influencing mechanism of consumers' willingness to purchase AI children's companion products from the perspective of value co-creation through empirical analysis. The study found that in the push-pull-mooring framework, performance expectancy, hedonic motivation, and social influence, as pull factors, significantly drive purchase intention; while ethical and privacy concerns, as push factors, significantly inhibit purchase intention. This result verifies the effectiveness of the PPM model in explaining intelligent product consumption decisions.

The most critical achievement of the study is clarifying the key role of AI co-creation ability. AI co-creation ability not only directly drives purchase intention (β=0.167) but also significantly moderates the relationship between push/pull factors and purchase intention: enhancing the positive effects of performance expectancy (β=0.099), hedonic motivation (β=0.108), and social influence (β=0.120), and weakening the negative effects of ethical and privacy concerns (β=-0.123). This finding verifies the important significance of the value co-creation theory in consumption decision research, indicating that in the era of intelligent consumption, consumers' co-creation ability has become a core factor affecting decisions.

This study further constructs a complete action path of "value co-creation - push/pull factors - consumption intention", explaining the internal operation mechanism of intelligent product consumption decisions. Different from traditional consumption decisions, the consumption decision of AI children's products presents obvious two-way interactive characteristics: consumers are not only recipients of product value but also co-creators of product value. This role transformation transforms consumption decisions from passive value recognition to active value construction, which has important theoretical significance for understanding the laws of consumer behavior in the digital intelligence era.

6.2. Research Limitations and Future Prospects

This study still has some limitations. From the perspective of research samples, although focusing on parents in first-tier cities is typical, the geographical distribution of the sample is not broad enough. Future research can expand the sampling scope to include samples from second and third-tier cities and rural areas to test the universality of the model. In terms of research design, cross-sectional data have difficulty dynamically capturing changes in consumers' attitudes and behaviors. In the future, longitudinal research design can be used to track the entire process of consumers from cognition to use.

In terms of the theoretical framework, this study focuses on the moderating role of AI co-creation ability. Future research can further explore other potential mooring factors, such as consumers' technical anxiety, parenting concepts and other variables. At the same time, this study focuses on purchase intention, a behavioral tendency variable. In the future, it can be extended to outcome variables such as actual purchase behavior and continuous use intention, thereby building a more complete behavior explanation model.

From an industrial promotion perspective, with the rapid iteration of AI technology and the continuous transformation of parenting concepts, the consumption decision-making mechanism of AI children's

companion products will also continue to evolve. Future research should keep up with technological development and changes in market demand, and timely adjust theoretical models and research hypotheses. Especially against the background of the rapid development of generative artificial intelligence and large-scale model technology, the capabilities of AI children's products in content generation, interactive experience, and personalization will be significantly enhanced. How this will change consumers' decision-making thinking and value evaluation criteria is worthy of in-depth exploration.

Finally, this study mainly explores the influencing factors of purchase intention from the consumer perspective. In the future, it can integrate the enterprise perspective to study how to promote value co-creation through product design, marketing strategies, and service innovation, so as to achieve a win-win situation between consumer satisfaction and enterprise development. This not only has theoretical innovation significance but also has important practical value for promoting the high-quality development of the AI children's companion product industry.

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