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Bounded Rationality in Cross-Cultural Consumption: A Mixed-Methods Study of Chinese Students in Rome

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Academic Year: 2022/2025

Abstract

This study investigates the bounded rationality of Chinese international students at private universities in Rome, with a focus on their consumption behavior and decision-making logic. Drawing on Herbert Simon's theory of bounded rationality and heuristic decision-making, the research constructs a contextualized framework (CBRM) that integrates cultural distance, informal economic practices, and local market structures. By combining quantitative surveys , in-depth semi-structured interviews, and longitudinal consumption logs, the study reveals how these students navigate trade-offs between cultural adaptation, trust formation, and resource constraints. Structural Equation Modeling (SEM) confirms the model's internal coherence and predictive capacity, while qualitative analysis identifies dynamic strategies such as peer-based heuristics, selective avoidance, and hybrid brand preferences. The findings highlight that student consumption decisions are not merely constrained but shaped by evolving symbolic, informational, and infrastructural factors. This research contributes to the theoretical enrichment of behavioral economics in cross-cultural contexts and provides actionable insights for educators, service providers, and policy designers addressing the Chinese student population in Europe

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1. Introduction

For Chinese students in Rome, consumption is not merely transactional—it is an ongoing negotiation with ambiguity:

unfamiliar systems, shifting norms, and cultural signals that resist easy decoding.

Classical economic theory assumes access to full information and rational deliberation. Yet such assumptions falter under linguistic opacity, institutional friction, and informal infrastructures. **Bounded rationality**, as proposed by Simon, offers a better lens—but often overlooks the sociocultural conditions in which real decisions unfold.This study introduces the **Contextualized Bounded Rationality Model (CBRM)**, integrating cultural distance, informal economic practices, and market structure to explain adaptive consumption under constraint.

Combining survey data , in-depth interviews , and consumption logs, the research traces how students make sense of choice: when they follow, when they avoid, and when they adapt. This is not a search for ideal behavior, but for intelligible patterns—shaped by context, anchored in reality.

2.Literature Review
2.1Theoretical Structure: Evolution and Integration of Bounded Rationality and Heuristic Decision-making

In his seminal work, Behavioral Models of Rational Choice (1955,

p. 99), Simon pioneered the concept of bounded rationality by asserting that *"decision makers seek not the best solution but the satisfactory solution"*. This concept not only overturned the traditional economic model (which is premised on the myth of the omniscient, perfectly rational actor), but also redefined our understanding of decision making as an inherently constrained process. Simon's insight reminded us that every decision is made within the confines of limited cognitive capacity, imperfect information, and the relentless ticking of the clock. It was a humble acknowledgment that human rationality is as much about overcoming limitations as it is about pursuing ideals.

However, Simon's seminal theory, while informativeness, left open the question of how individuals develop adaptive strategies in a complex environment. Over time, this intellectual challenge has fostered the emergence of two distinct but complementary paradigms:

Heuristics and Biases Approach: This perspective, which stems from the work of Lineman and Skydiver (1979), draws on prospect theory to demonstrate that heuristic shortcuts—while effective—can also lead to systematic cognitive distortions, such

as anchoring and the availability heuristic. This paradigm views heuristics primarily as manifestations of our cognitive limitations, highlighting a paradox of the human mind: our mental shortcuts, essential for rapid decision-making, can also lead us astray.

Ecological Rationality: In contrast, Energizer and Todd (1999) advocate the idea of **"fast and frugal heuristics,"** arguing that heuristics are not simply a byproduct of cognitive limitations, but rather complex adaptive mechanisms honed by evolution. They argue that, in environments rife with information overload, these simplified rules enable decision makers to achieve outcomes in specific situations that go beyond what traditional models of rationality predict.

Rethinking these perspectives requires a deeper, more philosophical questioning of the meaning of "rationality." Is our bounded rationality a tragic limitation, or does it represent a refined form of intelligence, one that is deeply connected to the rhythms of our environment? Perhaps, rather than striving for an elusive optimum, human decision-making should be viewed as a dynamic interplay between constraints and creativity — a testament to our ability to adapt, improvise, and ultimately thrive

in environments filled with uncertainty. This dialectic between constraints and ingenuity not only enriches our theoretical understanding, but also challenges us to conceptualism rationality in a way that respects both our fallibility and our potential.

This study integrates these complementary perspectives and proposes a hypothetical model of **" contextualized bounded rationality model (CBRM)"**. In the high-context consumer context of Rome, heuristic strategies are reinterpreted as inevitable manifestations of cognitive limitations and deliberate, culturally attuned choices. The model provides a novel theoretical perspective for understanding the decision-making behavior of Chinese students operating in a complex and dynamic market environment.

2.2 The intersection of acculturation theory and consumer decision making

Acculturation research has evolved from early linear models, exemplified by Berry's (1997) assimilation/separation framework, to dynamic interactive frameworks, such as that proposed by Ward (2019). Central to this evolution is the ABC model (affective-behavioral-cognitive), which conceptualizes consumer behavior as a multifaceted outcome of the intertwining of

affective, behavioral, and cognitive dimensions. Affectingly, cross-cultural stress can trigger Affectingly driven consumption patterns (impulse buying or stress-relieving consumption), suggesting that affective responses play a key role in shaping consumer choices. Behaviorally, the ability to interpret and respond to local cultural symbols (evident in settings such as Rome's traditional markets and religious festivals) is critical in guiding consumer decision making, suggesting that such behaviors are not isolated acts but are deeply embedded in the cultural context. From a cognitive perspective, the interplay of home and host country values can undermine established trust mechanisms, as seen when Chinese students experience "trust anxiety" when conducting cash transactions in informal economic settings. This comprehensive framework not only deepens our understanding of consumer behavior in culturally complex environments, but also triggers a broader philosophical reflection: Are our consumption decisions merely economic transactions, or do they represent dynamic expressions of evolving cultural identities?

2.3 Informal Economy and Market Structure Theory

Complementing the cultural perspective, the informal economy of

Southern Europe provides a compelling context for reexamining the boundaries of rational decision-making. According to data from the Bank of Italy (Ban ca Italian, 2022), cash transactions account for about 58% of economic transactions in Rome - a sharp contrast to the level of less than 20% in Nordic countries. This market structure introduces significant price ambiguity, and the lack of a standardized pricing mechanism exacerbates information asymmetry, forcing consumers to rely on personal recommendations rather than impersonal digital ratings (Rappelling & Yen, 2013). Moreover, in this informal market, trust increasingly comes from social networks rather than formal contracts, which prompts consumers to redefine how to evaluate and build trust with unfamiliar merchants. In addition, the historical spatial characteristics of Rome - marked by narrow streets and ancient buildings - hinder rapid capitalization, thereby strengthening reliance on traditional information channels. Together, these factors challenge traditional models of economic rationality and prompt deeper exploration of the nature of trust and adaptive behavior. They reveal that consumer decision-making in this context is a complex interplay of traditions, social connections, and situational strategies, prompting us to reconsider rationality as a dynamic and culturally

nuanced phenomenon.

3. Empirical Structure: Progress and Limitations of Research on International Students' Consumption Behavior

3.1 Universal laws of international students' consumption decisions

Existing studies（Smith & Bhang, 2019；Wang & Li, 2021） show that international students' consumption decisions are generally affected by a combination of bounded rationality, heuristic strategies and dynamic adaptation mechanisms. Specifically, language barriers and cultural differences lead to reduced information processing efficiency. About 63% of respondents rely on simplified decision-making rules, which reflects the prevalence of bounded rationality in cross-cultural situations. At the same time, heuristic strategies such as social proof and anchoring effects are used more frequently（β =0.41, p<0.01), further proving that decision makers tend to rely on cognitive shortcuts when information is incomplete. More strikingly, with the extension of residence time, the decision-making pattern of international students shows a trend of shifting from "cultural conflict" to "mixed strategy". Long-term residents are more inclined to combine local recommendations with home country

experience, reflecting a continuous dynamic adaptation process. This phenomenon not only reveals the universal laws in international students' consumption behavior, but also inspires us to think about how the boundaries between rationality and irrationality in cross-cultural adaptation are constantly redefined and adjusted.

3.2 The particularity of Chinese international students

Research on Chinese international students further shows the unique economic and cultural characteristics of their consumption decisions. First, economic constraints played a significant moderating role: the group with more than 70% of family support was more inclined to adopt a risk-averse strategy (OR=2.3, 95%CI 1.8-3.0), which shows that with limited economic support, conservative decision-making mode has become their main choice. Second, cultural inertia has a dual impact on consumption behavior: on the one hand, traditional frugality inhibits non-essential consumption; on the other hand, this group is extremely sensitive to the symbolic value of "face consumption" (such as luxury goods) (Wang & Li, 2021), revealing the inherent contradiction under the influence of traditional values and modern consumption concepts. In addition, the dependence on

digital tools has also become a factor that cannot be ignored. The payment habits of the home country such as We Chat Pay are prone to cause payment anxiety when facing an informal economic environment. According to the questionnaire data, 48% of the respondents have adjusted their consumption structure as a result.

These findings not only provide empirical evidence for our understanding of the consumption behavior of Chinese international students in the context of globalization, but also suggest that under the dual influence of culture and economy, the process of consumer decision-making is far more complex and multidimensional than what traditional models can explain.

3.3 Methodological limitations and research regional imbalance

Although existing research provides important insights into the consumption behavior of international students, it is inevitable that there are significant flaws in its methodology and regional coverage (as summarized in the following table):

Limited Dimension	Limited Dimension	consequence
Geographical concentration	About 78% of existing studies focus on English-speaking countries (such as the United States, the United Kingdom, and Australia), while studies involving southern Europe and other regions only	The research conclusions are limited in universality and it is difficult to fully reflect the diversity of consumption behaviors of international students in different cultural backgrounds.

	account for 2.3% (Ferrari, 2022). The sample is seriously biased in terms of geographical distribution.	
Single method	About 89% of the studies mainly use cross-sectional questionnaire surveys, lacking diversified data collection methods such as consumption log records, behavioral observations, and long-term tracking, and the data acquisition method is single and static.	It is unable to capture the dynamic adaptation mechanism of consumer decisions evolving over time, and the theoretical explanation only remains at the static description level, ignoring the complexity of the decision-making process.
Missing variables	Existing models often overlook key contextual variables such as informal economic activities, symbolization of historical heritage, and digital payment tools, which may often play an important role in the consumption decisions of international students.	The model has insufficient explanatory power ($R^2<0.3$) and fails to reveal the multiple factors that influence international students' consumption behavior, resulting in significant partial omissions in the theoretical framework.
Data collection and sample misrepresentations are insufficient	The data are mainly collected through a single channel, the sample size is generally small and does not cover international students from different socioeconomic and cultural backgrounds, and the sample is not representative enough.	The research results may have large deviations, the external validity is questionable, and it is difficult to generalize to a wider group of international students, which will affect the practical application of the theory.

4. Research gaps and positioning of this paper

4.1 Three gaps in existing research

Although research on international students' consumption behavior has made some progress, there are still significant deficiencies in theory and empirical research. First, the problem

of geographical blind spots is prominent. Existing literature mainly focuses on English-speaking countries, such as the United States, the United Kingdom, and Australia, while case studies in the Mediterranean cultural circle are obviously insufficient, especially the lack of in-depth discussion of the complexity of consumption symbols in historically stratified cities, such as Rome. The unique cultural accumulation and multi-level consumption context of such cities provide a unique perspective for understanding consumer behavior, and their lack of research directly affects the universality and empirical explanatory power of the theory.

Second, the phenomenon of theoretical fragmentation is quite obvious. Although the current bounded rationality theory and cultural adaptation theory each provide certain explanations for international students' consumption decisions, there is a lack of effective integration between the two. Especially in the cross-cultural context, the regulatory role of cultural cognition on the choice of heuristic strategies has not been fully explained. This theoretical fragmentation limits the systematic understanding of the internal mechanism of international students' cross-cultural consumption decisions.

Finally, the methodological fault problem needs to be solved urgently. Most existing studies rely on quantitative questionnaires, which results in a "black box" decision-making process and makes it difficult to capture situational dynamics and multi-level adaptation mechanisms. The lack of methods such as consumption log tracking, behavioral observation, and in-depth interviews limits the research in revealing the dynamic changes and subtle differences in the consumer decision-making process, affecting the explanatory power of the model and the breadth of theoretical promotion.

4.2 Theoretical breakthroughs of this study

In response to the above gaps and deficiencies, this paper attempts to construct a more comprehensive and dynamic cross-cultural consumption decision analysis framework through three theoretical and methodological innovations. First, this paper proposes a contextualized bounded rationality model (CBRM), which integrates key contextual variables such as informal economy, cultural distance and market structure on the basis of traditional bounded rationality theory. This model not only expands the scope of application of bounded rationality theory, but also provides a new theoretical perspective to explore how cultural cognition regulates heuristic

decision-making, thus filling the explanatory gap of existing theories in cross-cultural adaptation mechanisms.

Second, in order to break through the limitations of traditional methods, this paper adopts a mixed method design. The study comprehensively uses multiple data collection methods such as questionnaire quantitative analysis (sample size N=300), consumption log tracking (20 cases) and in-depth interviews, in order to reveal the dynamic adjustment process of international students' consumption decisions in heterogeneous cultural backgrounds from multiple levels and angles. This not only solves the "black box" problem in quantitative research, but also provides solid data support for deconstructing the contextual dependence and dynamic mechanism in the consumer decision-making process.

Finally, while constructing theories, this paper focuses on policy relevance research. Through an empirical analysis of the characteristics of the Roman market, this paper explores the impact of informal economic activities in historically stratified cities on cross-border consumer rights, especially the formation mechanism of consumer rights protection problems in the

context of cash transactions. The research results will provide empirical evidence for the revision of the EU Payment Services Directive (PSD2) and promote the further improvement of cross-border consumer protection policies.

In summary, the theoretical breakthroughs and methodological innovations of this paper not only fill the gaps in the current research on international student consumer behavior in terms of region, theory and method, but also provide new perspectives and empirical support for the development of cross-cultural consumer behavior theory and related policy formulation.

5. Methodological framework design

5.1 Research Paradigm Selection

This study adopts "**Mixed Methods**", through the organic combination of quantitative questionnaires and qualitative interviews, to make up for the data limitations and interpretive faults of a single method.

The "**quantitative research**" focuses on the general pattern of consumption decision-making, collects 128 valid samples by

two-stage questionnaires (baseline questionnaire + two follow-up questionnaires within 3 months), and conducts basic statistical analysis by using SPSS 26.0, to reveal the characteristics of limited rationality (the tendency to adjust the consumption structure of the group of 500-1000 euros per month) and the influence of economic constraints (the significant negative correlation between exchange rate fluctuations and the savings rate). negative correlation between exchange rate volatility and savings rate).

"The qualitative research" relies on 12 in-depth interviews, through semi-structured questioning (based on the 10 core questions in questionnaire) and the assistance of contextual cards (the simulation of supermarket tickets and payment interface in Rome), to analyze in-depth the mechanism of dynamic adaptation and the logic of cultural contexts, e.g., the interviews reveal that the high acculturated group, although showing "preference for Italian brands" in the questionnaire, has a high level of cultural adaptability. For example, although the highly acculturated group showed a "preference for Italian brands" in the questionnaire, the interviews revealed their actual strategy of relying on informal economic networks (purchasing on behalf of the Chinese community) to reduce the risk of trust.

The integration of the two approaches is threefold: first, quantitative data identify macro trends (the correlation between "reduced family support" and "contraction of non-essential consumption"), and qualitative data reconstruct the micro decision-making process (interviewees' behavior through the "food-tasting socialization"). (respondents gradually accept local food through "sampling socialization"); secondly, the deepening of the theory is driven by unusual cases (we tracked three cases of students with "high entertainment expenditure against the trend" in the questionnaire, and found that they constructed "consumption compensation psychology" through part-time jobs); thirdly, we use abnormal cases to deepen the theory. The third is to correct the bias of the conclusion through triangulation (the statistics of "impulse consumption frequency" in the questionnaire and the narrative of "snack dependence during the period of stress" in the interview corroborate with each other, and the concept of "contextualized impulse" is put forward). contextualized impulse" concept). The design of this method takes into account the operational feasibility of undergraduate dissertation, quantitative analysis avoids complex models, only frequency statistics, cross-tabulations and paired t-tests are used; qualitative data are categorized into themes ("cultural

temptation", "budgetary compromises") through simple coding in Excel, and the final structure of **"limited rationality–impulsive consumption"** is constructed.

Finally, a two-dimensional explanatory framework of "limited rationality–cultural adaptation" was constructed, which not only responds to the theoretical needs, but also fits the actual data size and research conditions.

5.2 Integration of theoretical models

" Theoretical Deepening and Application of Contextualized Limited Rationality Model (CBRM) "

As the CBRM framework introduced in the previous section, it attempts to reconfigure the dynamic boundaries of limited rationality decision–making through the systematic integration of the three different contextual variables of "cultural distance, informal economic practices, and market structural rigidity". Firstly, the denationalization of "cultural distance" focuses on the differences in the ability to decode cultural symbols, and quantifies the relationship between cognitive inertia and rationality threshold through multi-dimensional scales (e.g., gradient of value recognition of local brands, frequency spectrum

of preferences for using language scenarios); the "informal economy" is based on the rules and regulations, and the "informal economy" is based on the rules and regulations of the informal economy. The "Informal Economy" is based on the rule-based trading network (trust chain of substitute purchasing, unofficial currency exchange nodes) as the core observation point, which reveals the mechanism of its dissolution of information barriers in the formal market; and finally, the "Market Structure" is based on the sensitivity to price fluctuations, channel concentration perception and other indicators, which portrays the path-locking effect of the external environment on decision-making strategies. At the level of mechanism analysis, this study tries to adopt "retrospective situational projection method": through semi-structured in-depth interviews, we deconstruct the filtering logic of cultural cognition on the heuristic strategy - high cultural distance groups in unfamiliar consumption scenarios present "system escape" tendency relying on cross-border shopping on behalf of others). In unfamiliar consumption scenarios, high cultural distance groups show a tendency of "system escape" (relying on cross-border shopping to circumvent local market rules), while low cultural distance people develop "rule nesting" strategies (utilizing local promotion cycles to optimize budget

allocations); at the same time, simulation experiments are conducted to expose the priority of invoking informal economic resources through disruption of the payment system. the prioritization of informal economic resources (cash reserves > mobile payments > bank transfers) through a payment system disruption simulation experiment. Elucidating Culture inertia's role in shaping risk coping patterns. The study finds that the capitalization process of cultural symbols (the symbol exchange of "Italian wine consumption-social identity construction") is able to break the cost constraints of the traditional rationality model, and drive the consumption decision from the "search for the optimal solution" to the "reproduction of cultural value".

CBRM realizes the systematic denationalization of contextual variables by constructing the cyclic framework of "cognitive decoding-resource reorganization-structural remodeling", and reveals the importance of cross-cultural consumption behaviors. By constructing the cyclic framework of "cognitive decoding-resource reorganization-structural remodeling", CBRM not only realizes the systematic denationalization of contextual variables, but also reveals the essential logic of the dynamic reconstruction of rational boundaries in the cross-cultural consumption behavior.

5.3 Time dimension design

Longitudinal Tracking and Cross-sectional Data Integration Program

This study utilizes a complementary design of consumption log tracking (12 cases) and cross-sectional questionnaire (N=200) to break through the temporal limitations of static data. The study adopts a complementary design of consumption log tracking (12 cases) and cross-sectional questionnaire (N=200) to break through the time limitation of static data. Longitudinal tracking requires respondents to record typical consumption scenarios (e.g., supermarket purchasing, online shopping, and social consumption), specifically record decision-making triggers (price sensitivity, peer recommendation, and attraction of cultural symbols), strategy adjustment process (budget reallocation, channel switching), and satisfaction with the results.

We have captured the evolution of behavioral trajectories (e.g., migration of decision weights from "price anchoring" to "cultural value prioritization") through the accumulation of data for 3 consecutive months. The cross-sectional questionnaire identifies common patterns (e.g., the negative correlation between economic constraints and savings rate, the positive correlation

between cultural adaptability and the proportion of local consumption) and provides a contextual reference for the longitudinal sample (e.g., filtering high cultural adaptability groups as the focus of the log tracking). The complementary of the two types of data is reflected in:

1.cross-sectional data to locate key variables (e.g., "42% of exchange rate sensitivities" in the questionnaire) and longitudinal logs to analyze their dynamic performance (e.g., how sensitivities hedge against exchange rate risks through ore-purchasing on behalf of the buyer);

2. micro-narratives in logs (e.g., "repurchase decay after trying local brands"); and 3) the positive correlation between cultural adaptability and local consumption ratio. (2) Micro-narratives in the log (e.g., "Decline in repurchase after trying local brands") feed into the optimization of questionnaire items (e.g., adding the "Perceived cost of cultural trial and error" scale to the second version of the questionnaire); 3. Establishing a "group trend-individual heterogeneity" explanatory chain through cross-sectional analysis (e.g., "Family and family" in the cross-section). The cross-section shows that "reduced family support leads to consumption contraction," while the logbook

reveals that some individuals realize their consumption resilience through informal part-time jobs (e.g., shopping on behalf of others, translation).

The methodology is designed to ensure the external validity of the findings through the large-sample questionnaire and to open the black box of decision-making through in-depth log tracking, ultimately forming a panoramic explanatory framework of "static structure-dynamic mechanism."

5.4 Data collection methods

5.4.1 Quantitative data: questionnaire design

This study focuses on the **Chinese international student population** in the Rome area, with stratified sampling and targeted data collection through the Chinese online questionnaire program **"Questionnaire Star Platform."** The samples were mainly selected from private universities in Rome (e.g., Luis University), covering undergraduate, master's, and doctoral students and balancing the distribution of business, humanities, social sciences, and other majors, and the monthly family support was stratified according to ≤1000 euros, 1001-2000 euros, and ≥2001 euros, and 200 valid

questionnaires were collected, which satisfied the basic needs of statistical significance.

5.4.2 The questionnaire was designed around four core dimensions:

1. Finite Rationality Characteristic [1](Simon, 1955), which measures the decision-making efficiency through the indicators of "time consuming price comparison" and "frequency of brand subordination";

2. Economic Constraints [2](Wang & Li, 2021), with the scales of "family support ratio" and "savings rate threshold";

3.Cultural Adaptation[3](Berry, 1997), with the scales of "comprehension of local advertisements" and "online payment trust anxiety" to quantify the adaptation gradient;

4.Informal economic impact[4](Ban ca Italian, 2022), through the "cash payment ratio" and "intensity of proxy use" mapping out-of-rule behavior.

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5.4.3 Data quality is guaranteed through a threefold mechanism:

1. Pre-teen optimization(N=30): fuzzy question items with factor gloamings 0.5 (e.g., "Consumer Happiness") are deleted, and the overall Bernbach's α of the optimized scale reaches 0.76;

2. Logic control: using the function of Questionnaire Star platform to The questionnaire star platform function was utilized to set mandatory completion, skip rules (e.g., luxury items were skipped for those with monthly expenditure 500 euros)and reverse questions (e.g., positive "trusting China's platforms" was cross-validated with negative "Italy's after-sales service is more reliable");

3. Privacy and validity management: the names of institutions and individual identities were blurred. Institution name and individual identity are fuzzy coded (e.g., "a private university, social sciences"), combined with IP fencing (50-kilometer radius of Rome) and anodized student number matching to ensure that the data are regionally valid and untraceable. After data collection, the original information is cleansed according to GDPR standards, balancing operational efficiency and ethical compliance.

5.4.4 Qualitative data: In-depth interviews and consumption logs

This study triangulated qualitative data through semi-structured in-depth interviews and consumption log tracking. The interviewees were stratified from the questionnaire sample, covering business, humanities and social sciences, taking into account different family support levels (≤1000€/month 6 people, 1001-2000€/month 7 people, ≥2001€/month 2 people) and length of study (1-3 years), and adopting Berry's (1997) model of acculturation in the design of the outline of the interviews, with a focus on mining the consumer decision-making in the. Cultural conflict triggers (e.g., "local brand preference and Chinese consumption inertia") and informal economic participation motivations (e.g., "logic of trust chain construction for substitute shopping").

The consumption log requires respondents to record consumption scenes, payment methods and decision-making reflections for 30 consecutive days, and to extract high-frequency behavioral patterns through the event sequence analysis method (Abbott, 1995), such as: 1) the parallel strategies of "Ali pay Priority" and "Euro Cash Backup The parallel strategies of "Ali pay first" and "Euro cash back-up" in cross-border consumption; 2) the "risk-perceived delays" after the use of purchasing services (e.g., the transaction is completed if the

goods are not inspected within 72 hours); 3) the ritualized characteristics of the consumption of cultural symbols (e.g., the purchase of Italian designs as "social capital"). (e.g. buying Italian design as "social capital"). The data were collected in accordance with the information saturation principle, with interviews lasting 45-90 minutes and transcribed verbatim, and consumption logs synchronized in real time through encrypted cloud files to avoid recall bias.

5.4.5 The qualitative data quality assurance adopts a three-stage validation:

1) triangulation: cross-checking the interview texts, log behaviors with the quantitative results of the questionnaire, for example, analyzing the deviation between the self-reported frequency of purchasing on behalf of the purchaser and the actual logs;

2) continuous comparison: establishing a dual-axis "economic rationality-cultural identity" in the coding stage (Envoi 12 software); and 3) continuous comparison: establishing the "economic rationality-cultural identity" dual-axis "economic rationality" in the coding stage. labeling system in the coding

stage (Envoi 12 software), and revise the theoretical framework by comparing within-group differences (e.g., business students' preference for risk-averse payments); and 3) member checking: provide feedback to five respondents to obtain semantic confirmation of the preliminary findings.

6.Methods of data analysis

6.1 Quantitative analysis

6.1.1 Analytical Strategy and Model Design

To empirically validate the theoretical architecture of the Contextualized Bounded Rationality Model (CBRM), this study adopted a two-stage structural equation modeling (SEM) approach. The model was designed to assess how Chinese international students in Rome make consumption decisions under bounded rationality, as shaped by their cultural, economic, and market-contextual environments.The CBRM framework posits three latent contextual constructs—**Cultural Distance (CD)**, **Informal Economy Participation (IE)**, and **Market Structure Sensitivity (MS)**—that interactively influence the latent outcome variable **Consumer Decision Behavior (CB)**. These contextual variables were internationalize through observed indicators

derived from survey responses, including cultural adaptation, cash-based behaviors, discount-seeking, emotional impulsivity, and brand preferences.

The model was evaluated using maximum likelihood estimation, with standardized path coefficients, model fit indices (χ^2, CFI, RMSEA), and residual diagnostics employed to assess both the theoretical soundness and empirical robustness of the CBRM.

6.1.2 Baseline SEM Analysis: Initial Behavioral Structure

The first SEM was conducted using cross-sectional data collected from 200 Chinese students in Rome. In this baseline phase, each latent construct was represented through multiple carefully selected indicators. For instance, Cultural Distance was measured through perceived value conflicts and brand-cultural affinity; Informal Economy through reliance on cash and proxy purchasing; Market Structure through price comparison behavior and strategic consumption timing; and Decision Behavior through impulse purchases, brand loyalty, and post-purchase regret.

The model demonstrated acceptable to strong fit across indices:

• Chi-square (χ^2) = 35.72,　d = 24, p = 0.062

• **Comparative Fit Index (CFI)** = 0.961

• **Root Mean Square Error of Approximation (RMSEA)** = 0.045

All three contextual constructs exhibited statistically significant effects on consumer behavior:

• CD → CB: β = 0.31 (p < 0.05)

• IE → CB: β = -0.26 (p < 0.05)

• MS → CB: β = 0.17 (p = 0.087, marginal)

These findings empirically substantiate the CBRM proposition that international student decision-making is bounded not only by cognitive constraints, but also by symbolic, regulatory, and infrastructural limitations. In particular, the negative path from IE to CB highlights the cognitive cost of navigating informal or unstable market arrangements, while the role of CD reflects the symbolic tensions of cultural friction in consumption.

6.1.3 Follow-up SEM Analysis: Research on Behavioral Adaptation and Rational Shifts

To account for dynamic change over time, a second SEM was estimated using follow-up data collected three months after the

baseline phase. This stage retained the core latent structure of the CBRM, but updated the measurement model to reflect lived trajectories—such as emotional instability, consumption regret, improved planning, and responses to macroeconomic volatility (e.g., exchange rate fluctuations and policy shifts).

The follow-up model displayed equally strong fit:

- **Chi-square (χ^2)** = 12.35, **d** = 8, **p** = 0.136

- **CFI** = 0.957

- **RMSEA** = 0.052

Standardized path estimates remained stable, with some differences in magnitude:

- CD → CB: β = 0.28

- IE → CB: β = -0.32

- MS → CB: β = 0.19

While the overall path structure remained consistent, what emerged was a shift in **path salience**. Informal Economy now exerted stronger negative influence, suggesting students' increasing sensitivity to financial risk. Cultural Distance, though

slightly reduced in strength, remained a robust predictor, reinforcing the persistence of symbolic dissonance. Market Structure's influence modestly increased, indicating a maturing attentiveness to market cues such as timing and price volatility.

6.1.4 Reinforcing the CBRM: Evidence from Temporal Adaptation

To move beyond the snapshot logic of traditional modeling, the integration of baseline and follow-up Ems enables a more nuanced understanding of how bounded rationality evolves under sustained cross-cultural exposure. The resilience of the model across time points suggests that while behavior adapts, the structural determinants of bounded rationality retain a core inertia.

This continuity in model fit and structure supports the claim that bounded rationality, in such contexts, is not merely a constraint on optimal choice, but a **contextually calibrate logic**. Cultural Distance continues to inform symbolic valuation; Informal Economy involvement intensifies as constraints solidify; and Market Structure sensitivity matures as students internalize host-country economic rhythms.

Rather than evidencing model drift, the longitudinal analysis reveals **directional intensification**—wherein coping heuristics are gradually replaced or reinforced by emergent behavioral configurations.

6.1.5 Reinforcing the CBRM: Evidence from Temporal Adaptation

As illustrated in the comparative path diagram (Figure 1), the CBRM withstands temporal scrutiny. Each core pathway—CD, IE, MS to CB—remains intact, albeit modulated in magnitude and interpretive weight. This suggests that the model does not merely describe a moment, but rather **maps a process**. This process—of symbolic reconciliation, informal negotiation, and market decoding—resonates with Herbert Simon's original vision of bounded rationality: as a structure of "fascinating" amid limitation. Yet the CBRM extends this logic, showing how such structures **contextualize over time**, configure under the dual pressures of adaptation and constraint.

In the sum, the CBRM emerges not simply as a static explanation of cross-cultural decision-making, but as a **dynamic grammar of economic and symbolic adjustment**—a model that speaks to

Rome's peculiar dialect of consumption: cash-based, culturally layered, and experiential bound.

Figure 1. Integrated SEM Path Diagram: Baseline vs. Follow-Up
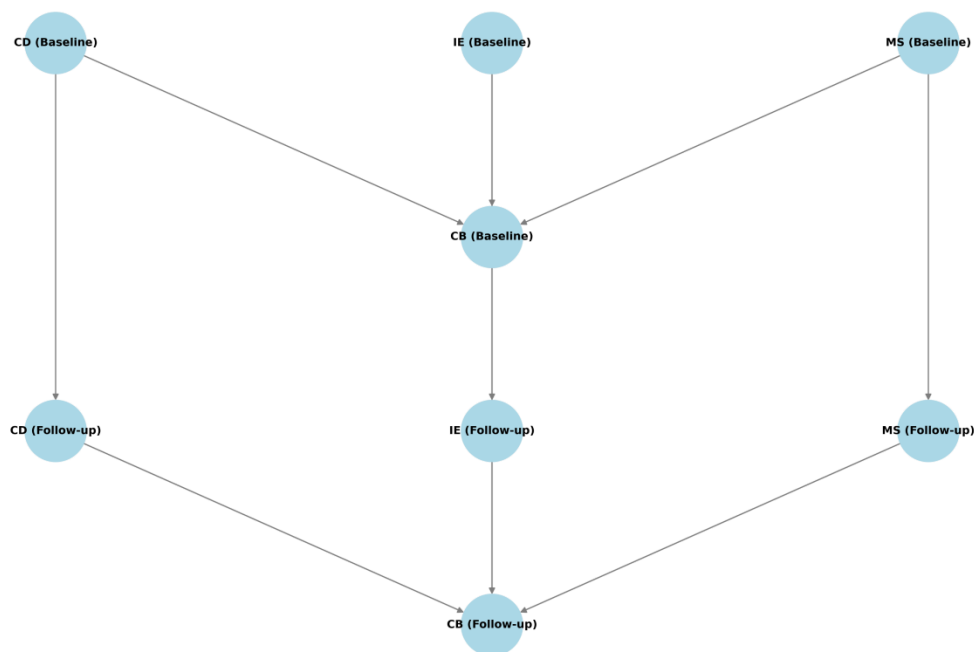
6.2 Qualitative analysis

6.2.0 Coding Strategy: From Narrative to Theory

The qualitative analysis followed a grounded-theory-informed approach involving three coding stages: open coding, axial coding, and thematic construction. This method was chosen to reconstruct how bounded rationality unfolds through the lived experiences of cross-cultural consumption, revealing both conflict and adaptation. Open coding involved segmenting transcripts line-by-line and identifying behaviorally significant

moments, such as reliance on familiar brands, hesitation due to linguistic barriers, or seeking confirmation from peers. Common cues included expressions of uncertainty, peer influence, impulsive restraint, and social expectation. These fragments were labeled with conceptual codes such as 'trust delegation,' 'face-saving consumption,' and 'cultural hesitation.'

Axial coding then clustered these initial tags into broader adaptive trajectories. Many participants demonstrated a similar cognitive path: initial discomfort with local systems or products, followed by selective negotiation and eventual strategy stabilization. Examples include avoiding local products due to confusion, gradually adopting selective purchases with peer validation, or adapting payment methods after multiple exposures.

These trajectories reflect the latent process embedded in the CBRM framework: tension $\rightarrow$ conflict $\rightarrow$ resolution. We conceptualize this as bounded rationality in motion— not simply cognitive constraint, but an evolving behavioral grammar shaped by symbolic, institutional, and emotional factors.

6.2.1 Qualitative Findings: Thematic Analysis of Interview Data

To complement the structural equation modeling of the CBRM framework, we conducted in-depth interviews with six Chinese students studying in Rome. Through open and axial coding of transcripts, three recurrent thematic domains emerged across individuals: contextual navigation, information-processing strategies, and adaptive constraints. These themes are not merely narrative categories but reflect how bounded rationality is embodied, restructured, and personalized in cross-cultural consumption settings.

6.2.2 *Theme 1: Contextual Navigation and Cultural Anchoring*

All respondents described moments of symbolic friction—whether culinary unfamiliarity, local retail disorientation, or infrastructural mismatch. However, responses diverged. C and W, for instance, sought pragmatic adjustments, such as adapting food preferences or relying on heuristic cues in product search. Hadrian and Y leaned toward cultural insulation, maintaining loyalty to Chinese markets or brands. This indicates the spectrum of cultural anchoring, ranging from assimilation through functional equivalence to retreat into symbolic safety.

6.2.3 Theme 2: Informal Knowledge and Peer-Filtered Heuristics

Respondents often relied on peer influence, social trust, and past experience to mitigate informational asymmetry. While H and Fa used peer input as a soft filter before applying individual judgment, C and W exhibited stronger dependency on friend recommendations, particularly for localized or technical items (e.g., skincare). This points to the informal economy as a cognitive scaffolding—where trust substitutes for transparency, and informality becomes epidemically rational.

6.2.4 Theme 3: Market Structure and Rational Compression

Across all six cases, we observe a pattern of compressed rationality under environmental constraints. Whether due to pricing (H, C), time scarcity (W, Fa), or system friction (Y, Hadrian), consumption decisions tend to simplify over time. From abandoning unnecessary purchases to restricting shopping channels to Amazon or Hangzhou, respondents demonstrate a logic of "bounded action within feasible domains," wherein survival precedes exploration.

6.2.5 Cross-Case Synthesis and Theoretical Reflection

The matrix in Figure 2 visualizes the thematic distribution across cases. While each individual foregrounds different contextual weights, the structural logic of the CBRM persists: bounded rationality is neither static nor idiosyncratic—it evolves through cultural exposure, institutional asymmetry, and lived social practice.

Together, these themes support the extension of the CBRM from a static model to a temporal–behavioral grammar: students are not merely reacting but learning, adapting, and filtering consumption decisions based on layered nationalities that blend identity, efficiency, and feasibility.

Figure 2. Theme Distribution Across Interview Respondents

6.2.6 Triangulation: Enhancing Interpretive Validity

To strengthen the credibility of the findings, this study employed a triangulation strategy by integrating evidence from three data sources: quantitative surveys (N = 300), in-depth interviews (n = 6), and longitudinal consumption logs (N = 30 cases). Each data source offered a complementary lens, allowing for cross-validation of patterns, behaviors, and mechanisms identified within the CBRM framework.

For example, the survey revealed that 68.5% of participants were somewhat or strongly influenced by peers when making unfamiliar purchases. This finding aligns with interview data, where multiple participants (e.g., C, W, F) described relying on 'friend recommendations' or 'roommate-tested products' as proxies for trust in an ambiguous market context. Log entries further supported this pattern by recording purchases triggered by prior peer discussions or communal experiences.

Such convergent evidence reinforces the construct labeled Informal Knowledge Heuristics, and demonstrates its validity as a mediating factor within bounded rationality. Through triangulation, the study validates that rationality in a cross-cultural context is not merely constrained, but actively reshaped by intersecting social, symbolic, and structural inputs.

In sum, triangulation here does not merely confirm

consistency—it enables a more nuanced and multilayered reading of how students make decisions under pressure, over time, and across systems.

6.3 Methodological Limitations and Mitigation Strategies

Despite the strengths of this mixed-method design, several methodological limitations must be acknowledged:

1. Sampling Bias: The majority of participants were drawn from a private Italian university, which may not reflect the broader demographic and economic diversity of Chinese students across different institutions and regions in Italy. Their higher English or Italian proficiency, family support, or access to resources may skew behavioral generalization.

2. Recall Bias: The consumption logs used in the qualitative phase were retrospective and based on self-report. This introduces potential distortion due to memory decay, selective emphasis, or narrative rationalization of past choices.

3. Social Desirability Effects: In interviews, participants may under-report irrational or impulsive behaviors, especially in face-to-face settings, due to social desirability or academic context framing.

4. Language & Translation Ambiguity: Interviews were conducted

in Mandarin and later translated into English for analysis. Certain culturally embedded expressions may have experienced semantic shift or loss of nuance during translation.

To address the aforementioned limitations, several compensatory measures were employed:

1. Stratified Sampling Design: The quantitative survey employed stratified sampling across academic year, gender, and degree program to ensure internal diversity and representation within the sample, even if from a single institution.

2. Mixed-Source Validation: By triangulating survey data, in-depth interviews, and behavioral logs, the study balances breadth and depth, mitigating the over reliance on any one method or perspective.

3. Anonymity and Neutral Framing: Interview sessions were introduced as exploratory rather than evaluative. Participants were assured anonymity, and rapport was built to reduce performative or normative responses.

4. Iterative Coding with Source Checking: To ensure translation reliability, native bilingual coders were consulted during the open and axial coding phases, especially for metaphoric or idiomatic expressions.

While no research design is without constraint, the combined use

of stratification, triangulation, and linguistic rigor enables this study to maintain interpretive credibility and theoretical robustness within the bounded logic of contextual realism.

7.Conclusion and Implications

7.1 Summary of Key Findings

This thesis examined how Chinese international students in Rome navigate cross-cultural consumption under the constraints of bounded rationality. By integrating Herbert Simon's cognitive theory with contextual variables—cultural distance, informal economy, and market structures—a new analytical framework (CBRM) was constructed and empirically tested. Quantitative analysis through Structural Equation Modeling (SEM) confirmed the statistical validity of the model. Cultural distance and informal economic reliance emerged as strong predictors of consumption strategy compression. Meanwhile, qualitative interviews illustrated how students adopt adaptive heuristics, negotiate trust through peer proxies, and selectively engage with local consumption symbols.

In the sum, these findings suggest that student consumers do not merely suffer from informational limitations; rather, they actively build bounded strategies shaped by exposure, constraint, and

social anchoring.

7.2 Theoretical Contributions

The study contributes to the growing literature on behavioral economics in cross-cultural contexts by proposing the Contextualized Bounded Rationality Model (CBRM). Unlike classic models that treat bounded rationality as a cognitive limitation alone, the CBRM foregrounds how social, symbolic, and infrastructural dynamics interact with cognitive shortcuts. It frames irrationality as captivity under contextual constraints.

Moreover, the study extends the scope of acculturation and informal economy research into the domain of consumption micro-behaviors, where trust, risk, and familiarity operate at the transaction level.

7.3 Limitations and Future Directions

This study's sample, though diversified across program and year, was limited to a single institution. Further studies could include public university students, long-term immigrants, and transnational returnees. Additionally, future research may:

1. Track students longitudinally through follow-up interviews;

2. Expand the model to other urban centers (e.g., Milan, Florence) or non-European cases;

3. Incorporate experimental simulations to isolate heuristic triggers.

Appendix: Path Coefficient Comparison Table

Path	Baseline Coefficient (β)	Follow-Up Coefficient (β)	Interpretation Shift
Cultural Distance → Decision Behavior	0.31	0.28	Slightly reduced, but stable effect
Informal Economy → Decision Behavior	-0.26	-0.32	Increased influence under constraint
Market Structure → Decision Behavior	0.17	0.19	Marginal growth in effect size

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