



# EXPLORING THE INFLUENCE OF CULTURAL VALUES AND DEMOGRAPHIC FACTORS ON DEAL PRONENESS

Master Thesis – Data Science & Marketing Analytics

## Abstract

In an era of globalization, comprehending cultural influences on consumer behavior has become increasingly important. This thesis investigates how individual and national-cultural values, alongside demographic characteristics, influence consumers' proneness to deals. A methodological approach combining a multilevel regression model with a random forest model was employed to explore this dynamic. The study reveals that while national-cultural values alone did not significantly impact deal proneness, they gain significance when combined with other variables such as age and gender. These findings underscore the importance of cross-cultural interactions in shaping deal proneness, offering nuanced insights into the interplay of cultural and demographic factors in influencing consumers' deal-seeking tendencies.

Author:	Nils Burghouwt
Student number:	511637
Supervisor:	Martijn G. de Jong
Co-reader:	
Date:	30-11-2023

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Academic Relevance . . . . .	3
1.2	Managerial Relevance . . . . .	4
1.3	Thesis overview . . . . .	5
<b>2</b>	<b>Literature Review</b>	<b>6</b>
2.1	Understanding Sales Promotions . . . . .	6
2.2	Understanding Consumer Deal Proneness . . . . .	9
2.3	Individual Values . . . . .	11
2.4	National-Cultural Values . . . . .	15
2.5	Cross-Cultural Interactions . . . . .	18
2.6	Conceptual Framework . . . . .	20
<b>3</b>	<b>Methodology</b>	<b>21</b>
3.1	Methodological Framework . . . . .	21
3.1.1	Multilevel Regression . . . . .	21
3.1.2	Random Forest . . . . .	24
3.2	Dataset Overview and Characteristics . . . . .	25
3.2.1	Dataset Overview . . . . .	26
3.2.2	Initial Analysis . . . . .	27
<b>4</b>	<b>Results</b>	<b>32</b>
4.1	Multilevel Regression Models . . . . .	32
4.2	Random Forest Model . . . . .	37
4.3	Hypothesis Outcomes . . . . .	44
<b>5</b>	<b>Conclusions and Limitations</b>	<b>45</b>
<b>6</b>	<b>Appendix</b>	<b>48</b>
6.1	Establishment and Reliability of Schwartz’s Framework for Individual Values . . . . .	48
6.2	Establishment and Reliability of Schwartz’s Framework for National-Cultural Values . . . . .	51
6.3	Values and Corresponding Attitudes Within the Dataset . . . . .	53
6.4	Dataset Characteristics . . . . .	55
	<b>References</b>	<b>60</b>

# 1 Introduction

Consumer behavior has always been shaped by a multitude of factors, including personal preferences, economic conditions, and broader societal and cultural influences. With the rise of globalization, the societal and cultural influences have become even more complex and interconnected than ever before. Comprehending these influences has thus become increasingly important. People now travel more frequently, and are exposed to a greater diversity of cultures and attitudes than in the past. This has led to a more nuanced understanding of the ways in which cultural differences can shape purchasing behavior.

For instance, research by O’Cass and Frost [26] found that cultural factors influence how consumers respond to various marketing tactics, including price promotions. These findings underscore the importance of understanding how cultural factors can influence consumer behavior in today’s globalized economy. By gaining a deeper understanding of these dynamics, marketers can develop more effective strategies that connect with diverse audiences in various cultural settings.

In order to answer the question of how cultural differences can shape purchasing behavior, the concept of values will be used. Values are cognitive beliefs about desirable goals and modes of conduct that vary in importance and serve as standards to guide attitudes and behavior [31]. These values differ from person to person and act as standards that guide our attitudes and actions. They are important goals that shape our lives and are a big part of who we are. Attitudes, on the other hand, are evaluative responses that directly influence specific behaviors [3]. Values are important in shaping attitudes because they give us a strong foundation for understanding our beliefs. They are the fundamental building blocks of how we adapt and form attitudes.

Values are used over attitudes for two main reasons. Firstly, a relatively small number of values is believed to underlie, and potentially influence, many if not all social attitudes. Due to the abstract nature of values, a smaller number of values can encompass a broader range of social characteristics compared to attitudes [28]. For instance, the attitudes of ”recycling” and ”reusing” can both be encompassed by the overarching value of ”environmental sustainability.” This highlights how a single value can serve as a guiding principle that influences multiple attitudes or behaviors.

Secondly, values are known to be more stable and enduring compared to attitudes. While attitudes can fluctuate depending on situational factors or external influences, values remain relatively consistent over time [8]. This stability makes values a valuable tool for analyzing and predicting long-term behaviors, such as purchasing decisions. Let’s again consider the value of ”environmental sustainability”. This value reflects the belief that it is important to protect and preserve the environment for current and future generations. Individuals who hold this value are likely to exhibit consistent attitudes and behaviors that align with this value, such as actively seeking out environmentally-friendly products and supporting eco-friendly brands. Unlike attitudes that may change based on external factors, the value of environmental sustainability is more likely to remain stable and guide an individual’s purchasing decisions consistently over time.

In order to decide which values to use, we will make use of a framework. As this study will examine the influence of values on the individual as well as the cultural level, the framework of Schwartz

will be used. Compared to other frameworks, such as the four cultural dimensions of Hofstede [17], the framework of Schwartz has a hierarchical structure, which makes a distinction between values at the individual level and values at the cultural level.

Schwartz [32] suggests that values at the individual level reflect the conflicts and compatibilities people experience when pursuing their different values in everyday life. On a national and cultural level, values represent the various solutions that societies develop to regulate human activities. They also involve different ways institutions prioritize and justify their investments, which can vary from one culture to another.

The framework has been extensively validated through cross-cultural research in various countries and regions. For example, Schwartz et al. [38] confirmed the validity of the values theory using a different measurement technique. This alternative method offers a more concrete approach by describing individuals instead of using abstract value terms. The research found that the method effectively measured the intended values, and did not confuse them with unrelated ones, which implies the validity of Schwartz's framework.

Furthermore, the values described by Schwartz have already been widely used to understand and compare cultural differences across countries, and have been linked to a range of consumer behaviors [34]. One key aspect of this behavior is consumer deal proneness, or the likelihood of consumers to seek out and take advantage of discounts, promotions, and other types of special deals [1]. This study seeks to examine the relationship between consumer deal proneness and the framework of Schwartz across different countries of the world. Specifically, we aim to answer the following research question:

How do values at both individual and national-cultural levels influence consumers' deal proneness, and how do these values relate with the countries' demographic characteristics?

In order to address this research question, a multilevel regression model will be used, which is a statistical technique that accounts for the hierarchical nature of the data, where individual consumers are nested within countries [10]. Before delving into the impact of various cultural universal values on consumer deal proneness, we'll first establish a model with level 1 predictors. These predictors encompass basic sociodemographic variables such as family size and income. After establishing this baseline, we can then integrate the cultural values into our model, which allows us to investigate the influence of the cultural universal values on consumer deal proneness, and the influence of these values per country.

Moreover, given the cultural differences across countries, a multilevel regression model is particularly well-suited for this research as it allows us to model and estimate both within-country and between-country variation in consumer deal proneness. This approach provides a more nuanced understanding of how cultural factors at the macro-societal level may influence consumer behavior, and allows for the identification of potential cross-cultural similarities and differences in consumer deal proneness.

Additionally, to validate and complement the insights obtained from the multilevel regression

model, a random forest model will be utilized. Random forests, being non-parametric and capable of handling complex interactions, serve as a robust tool for predicting consumer deal proneness across varying cultural and demographic backgrounds [7]. Not only will this model offer a measure of the predictive accuracy, but it will also provide an ordered list of variable importance. This helps in highlighting which individual and cultural factors are most critical in influencing consumer deal proneness across different countries.

## 1.1 Academic Relevance

The proposed research question on consumer deal proneness and the cultural universal values has important academic relevance as it can contribute to the development of a more comprehensive understanding of consumer behavior across different cultures. By examining the relationship between cultural values and consumer deal proneness, this study can help identify the extent to which cultural values play a role in shaping consumer behavior in different countries.

*Expanding Deal Proneness Research.* Numerous studies have investigated the impact of various demographic and socioeconomic elements on deal proneness. For instance, research conducted by Robert Blattberg [5] utilized a consumer buying behavior model to analyze the household characteristics in Chicago that potentially influence deal proneness. This analysis revealed that homeowners, car owners, households with no young children, and those without working wives were more prone to being drawn to deals. In another study, Webster [12] sought to profile the 'deal-prone' consumer in the U.S., focusing on identifying any distinguishing demographic, socioeconomic, or purchasing traits. His findings suggested that deal-prone individuals are more likely to be older housewives who exhibit a diverse brand preference while not being loyal to a single brand, even though these characteristics accounted for a mere 1.5% variance in deal proneness.

Contrasting previous works that predominantly focus on demographic and socioeconomic parameters, our research intends to integrate these level 1 predictors with an analysis of consumers' cultural values to discover deeper underlying causes of deal proneness. Furthermore, this study aims to enhance the global relevance of the findings by adopting a cross-cultural approach, moving beyond the limitations of single-country data common in the existing literature.

*Gap in Cross-Cultural Deal Proneness Studies.* In the field of cross-cultural studies, many researchers have utilized the concept of values to analyze consumer behavior across different nations. For instance, Steenkamp and de Jong [40] examined consumer attitudes towards both local and global products, breaking down sociodemographic variables, Schwartz's ten individual values, and some national-cultural values, similar to the approach in our study. However, their research did not delve into attitudes surrounding deal proneness. A similar gap is found in the work of Hennings et al. [16], where a collaborative investigation spanning 10 countries sought to understand the values and motivations of luxury consumers across borders, yet did not encompass deal proneness in their analysis.

A study that integrated deal proneness within a cross-cultural context is the one conducted by Sharma and Singh [40]. In this research, Hofstede's cultural dimensions were employed to explore

the connection between culture and deal proneness. Nonetheless, the study was confined to data from merely three nations, namely the USA, Thailand, and Kenya, and it overlooked the examination of interaction effects between cultural values and the demographic variables of these countries. Yet, the findings from this research will be utilized to formulate the national-cultural hypothesis for this study, as the dimensions of Hofstede align closely with Schwartz’s national-cultural values.

In short, while there exist many studies examining consumer behavior across diverse cultures, and separate studies delving into the factors that influence an individual’s proneness to engage with deals, there is a noticeable gap when it comes to intersecting these two topics. This research seeks to fill this gap, exploring the untapped path where cultural universal values meet consumer deal proneness.

*Generalizability.* Besides filling this gap, the findings of this study can also have broader implications beyond the specific countries included in the analysis. The use of Schwartz’s Theory of Basic Human values provides a theoretical framework that can be applied across a wide range of countries and cultural contexts. As such, the results of this study can be generalizable to other countries and regions, providing a more comprehensive understanding of the relationship between cultural values and consumer behavior in different cultural contexts.

*Validity.* Furthermore, this study can contribute to the ongoing debates and discussions on cultural universals and variation, as it examines the applicability and validity of Schwartz’s Theory of Basic Human Values in the context of consumer behavior (Schwartz, 2007). The results can inform future research on cultural factors and consumer behavior, particularly in the area of consumer deal proneness.

## 1.2 Managerial Relevance

*Adapting Marketing Strategies to Cultural Contexts.* The proposed study has important managerial relevance as it can help businesses better understand consumer behavior in different cultural contexts, and develop more effective marketing strategies. Understanding how cultural values influence consumer deal proneness can help companies design more effective marketing strategies for different countries and cultural contexts. For example, a marketing campaign that appeals to individualism may be more effective in countries with high individualism scores, while a campaign that emphasizes collectivism may be more effective in countries with low individualism scores. A campaign centered on individualism might highlight the personal gains and benefits one would get from a deal, while a collectivism-centered campaign might focus on the benefits the deal offers to the community or a group. Understanding these preferences and crafting marketing strategies accordingly can potentially increase the effectiveness of the campaign, making consumers more prone to engaging with the deals presented to them, and therefore making the most of the deal proneness of different consumer groups in a culturally sensitive and effective manner.

*Optimizing Marketing Resource Allocation Through Cultural Insights.* Additionally, this research can assist businesses in making informed decisions about which markets to target. By understanding how cultural values influence consumer deal proneness, companies can better calibrate their decision making around marketing resource allocation [25]. While considering intrinsic factors such as market and population size, competition, and economic dynamics, businesses can integrate insights on cultural values to identify markets where their marketing strategies are likely to be most effective,

and allocate resources accordingly. For instance, a company that sells consumer goods may strategize to target markets showing higher levels of deal proneness due to common cultural attributes, while also considering other significant market indicators. Thus, the inclusion of cultural values and deal proneness into decision making around marketing resource allocation can encourage a more nuanced approach to market selection, helping to customize strategies to the distinctive preferences of consumers in various markets. This effort could lead to a potential surge in sales and profitability by utilizing a well-matched mix of cultural insights and established marketing analytics.

### **1.3 Thesis overview**

To shed light on the nuances of consumer deal proneness in a cross-cultural setting, this thesis is segmented into several focused chapters. Chapter 1 introduces the topic and establishes the research question and objectives that steer this thesis. Chapter 2 offers a concise review of the existing literature, outlining key theories and findings that relate to consumer deal proneness from a cross-cultural viewpoint. In Chapter 3, the data collection, research design and methodological approach of the study are detailed. Chapter 4 delineates the results of the models. Lastly, Chapter ?? concludes the thesis with directions for future work.

## 2 Literature Review

Understanding consumer behavior in the globalized market requires a detailed analysis of various influencing factors. This literature review aims to examine deal proneness, considering the pivotal roles of individual and national cultural values. Initially, we focus on consumers tendency towards sales promotions, a behavior significantly shaped by individual tendencies known as "deal proneness". Following this, we broaden our discussion to include individual cultural values that significantly influence consumer decisions. As we delve deeper, we explore the area of national and cross-cultural interactions, emphasizing their role in shaping consumer responses to deal proneness. Lastly, we will outline the conceptual framework that anchors this study, offering a structural perspective on the topics discussed.

### 2.1 Understanding Sales Promotions

Sales promotions are a cornerstone of marketing, distinguished by their extra incentives to stimulate consumer behavior and drive sales, standing apart from advertising, personal selling, and public relations [21]. Defined in various scholarly works, sales promotions are elucidated as temporary incentives aiming to elicit consumer purchasing and specific responses, marking their significance in both online and offline retail landscapes for attracting and retaining customers [9].

The scope of sales promotions in the contemporary retail landscape is extensive, underscoring their crucial role in shaping consumer behavior. They serve as triggers for unplanned purchases, promote the acquisition of non-promoted merchandise, increase the frequency of shopping trips, and reduce inventory costs for retailers [21]. The start of digital technology has broadened this scope, with online platforms utilizing promotional codes or dedicated web page links for promotions.

An examination of the various techniques and tools utilized in sales promotions reveals a diverse assortment, including in-store displays, two-for-one promotions, coupons, loyalty programs, contests and sweepstakes, rebates, and price discounts [21]. These strategies are carefully designed to temporarily modify the perceived value of a brand and accelerate the sales process. Further categorization of sales promotions differentiates them into consumer and trade sales promotions, the latter involving an array of short-term tactics such as offers, premiums, contests, free trials, and price packs, designed to stimulate consumer responses [13].

Before delving deeper into sales promotions, it's essential to narrow down our focus within the broad framework sales promotion strategy. Voss and Seider [46] categorize the sales promotion strategy into various facets: sector (e.g., technology vs. fashion), firm (e.g., a startup vs. a multinational corporation), competitive (e.g., market leader vs. new entrant), and demand characteristics (e.g., seasonal demands vs. perennial demands). However, this study will specifically concentrate on local consumer characteristics, as indicated in blue in Figure 1.



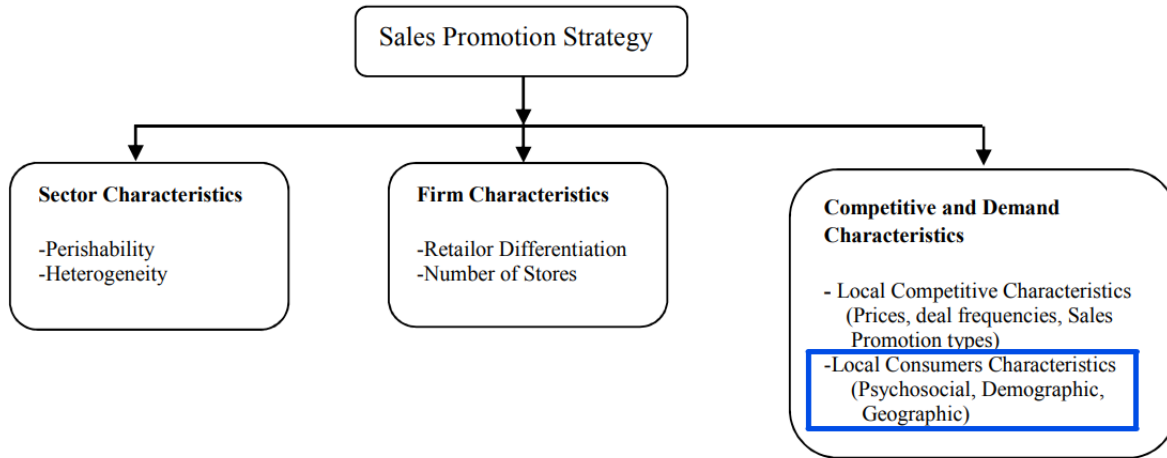


Figure 1: Sales Promotion Strategy [46]

Understanding the variety and scope of today’s sales promotions calls for an examination of their evolution. From the first coupons to the advent of digital platforms, this history highlights the industry’s adaptability to changes in consumer behavior and technology. Some key developments are shown in Figure 2.

*Introduction of Coupons.* The first notable development in the history of sales promotions can be traced back to the 19th century with the introduction of coupons. C. W. Post initiated this innovation in 1895, offering a one-cent price reduction on the purchase of Grape Nuts cereal. This marked the beginning of using coupons as a fundamental element in sales promotions. However, the success of coupons was initially hindered by the limitations of printing technology at the time and a lack of consumer awareness surrounding the benefits of coupons, delaying their common acceptance and use until later years [4].

*Shift in Consumer Behavior & Impulse Buying.* As we moved into the mid-20th century, a pivotal shift occurred in consumer behavior, with shoppers demonstrating an increased inclination to make decisions at the point of sale rather than planning ahead. A study by Hawkins Stern highlighted this trend, underscoring the emergence of impulse buying. This shift was largely driven by the expansion of self-service stores, enabling consumers to explore and compare products autonomously. The presence of in-store advertising and displays providing essential information further facilitated this trend [44]. Besides that, the phenomenal growth of coupon distribution in the 1970s coincided with a period of high inflation. Along with the need to be conscious of current prices, coupons were seen as a widely used anti-inflation strategy [4].

*Loyalty Programs.* In the 1980s, the landscape of sales promotions saw a significant shift with the launch of the first comprehensive loyalty program by Texas International Airlines. This program rewarded passengers based on their travel frequency [15]. Quickly gaining traction, especially among large corporations, the success of loyalty programs depended on various factors such as market saturation, share, and category growth potential. They have proven effective in enhancing customer loyalty, increasing shopping frequency, and boosting the overall value of a customer. Research indicates that with notably better reward structures or higher discount rates than competitors, loyalty

programs can counterbalance challenges presented by having a smaller market share. Furthermore, in product categories with substantial growth potential, loyalty schemes can successfully protect industry interests and pull in consumers new to the industry [24].

*Online Sales Promotions.* The emergence of the internet during the 1990s marked a new era for sales promotions. Companies began leveraging online platforms, utilizing strategies such as email marketing, banner ads, and promotional websites to reach a wider audience and promote their products and services. In an insightful study by Michael Lewis, it was highlighted that digital coupons (e-mail coupons) amplify demand in a dual manner. Initially, they act by reducing effective prices, directly boosting current period demand. However, there's also an connected effect between these short-term digital coupon campaigns and long-standing loyalty programs. Specifically, when an online coupon persuades a customer to buy, it indirectly increases their accumulated purchases or commitment to a rewards program. This progression towards a potential reward enhances the appeal of the loyalty program, further driving purchases in subsequent periods. Furthermore, Lewis's study emphasized that while the loyalty program predominantly impacts one segment, the digital coupon effectively encourages increased spending across multiple consumer segments [23].

*Social Media Promotions.* The early 2000s saw the rise of social media platforms like Facebook, Twitter, and Instagram, offering businesses new ways to engage with customers, run contests, offer exclusive deals, and build brand awareness in a more interactive and personalized manner. Besides directly sharing deals on their proprietary social media channels, companies benefited as consumers took on the roles of both promoter and distributor of online coupons within their own networks. This encouraged customer-to-customer conversations around the promotions. Through online reviews and word-of-mouth on these platforms, customers amplified the spread and influence of digital coupons. Consequently, businesses could exponentially magnify the impact of their promotions through the power of social media [41].

*Personalization and Big Data.* The decade of the 2010s saw major technological leaps, with big data analytics coming to the fore, allowing businesses to tailor promotions according to a user's individual actions, inclinations, and purchase patterns. Such advancements enabled companies to gather detailed feedback from customers. By accessing public data regarding a customer's online profile and browsing habits, businesses could gain insights into customer profiles and preferences [41]. Several studies have highlighted the benefits of such personalization. For instance, research by Tran et al. indicated that custom-tailored advertisements on social network sites (SNS) can modify the way consumers view a brand, influencing the relationship between consumer and brand. This insight is promising for businesses looking to incorporate SNS into their marketing strategies, especially with an aim to strengthen brand identity [45]. Moreover, collecting more data can enhance the success of sales promotions. With the introduction of scanner data, there's been a noticeable increase in research assessing the impact of sales promotions using mathematical modeling, such as time series evaluation and regional specificity. Currently, there exists a comprehensive array of refined models and methodologies to determine how sales promotions influence sales outcomes [47].

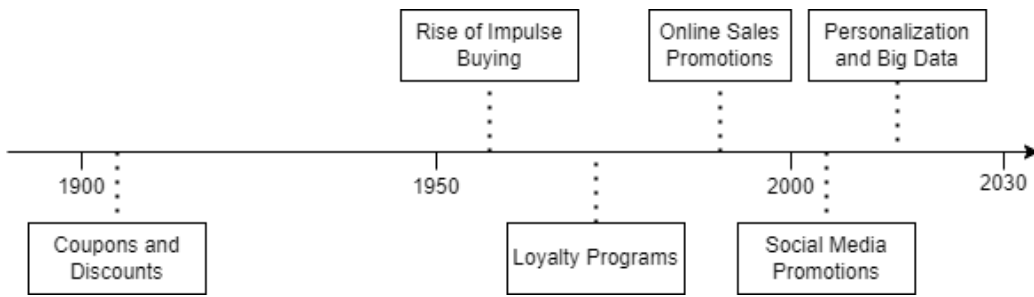


Figure 2: Evolution of Sales Promotions

Navigating through history, sales promotions have dramatically transformed, combining technological, social, and behavioral aspects. From the beginning of coupons by C.W. Post in the 19th century through the emergence of impulse buying, to the digital revolution of online and social media promotions, and the detailed personalization enabled by big data in the 2010s, the trajectory of sales promotions has been both innovative and adaptive.

Yet, despite the impressive evolution and the many tools available for businesses, it's worth noting a clear difference in the world of sales promotions. They account for approximately two-thirds of all promotional spending, yet only a staggering 16% of these initiatives are profitable [11]. This variation brings forth a significant question: What drives consumers to respond favorably to certain promotional strategies over others? One crucial factor that plays a role in this scenario is the concept of 'deal proneness'.

## 2.2 Understanding Consumer Deal Proneness

As mentioned in Chapter 1 consumer deal proneness can be defined as the likelihood of consumers to seek out and take advantage of discounts, promotions, and other types of special deals [1]. The concept of deal proneness was first explored by F.E. Webster [12]. Webster's research aimed to identify characteristics that typify the "deal-prone" consumer, considering factors such as demographics, purchasing habits, and socioeconomic attributes. To determine these attributes, Webster first developed a measure for deal proneness. This measure depended on the difference between actual dealing behavior and opportunity to deal corrected by the family brand share. This resulting Deal Proneness Index served as the dependent variable. The study then analyzed this against a set of variables, including purchasing behaviors (like shopping frequency) and demographic factors (such as the age of the primary household shopper in the household). Of the numerous variables considered, four emerged as consistent indicators of a consumer's likelihood to be deal-prone: the age of the primary household shopper, the ratio of a family's most-purchased brand to their total purchases, the variety of brands they buy, and their overall purchase volume.

The findings suggest that deal proneness increases with the age of the primary household shopper and as the diversity of brands purchased grows. On the other hand, it decreases when there's a high loyalty to a single brand and as the overall purchase volume goes up. In essence, a typical deal-prone consumer could be described as an older primary household shopper who, while purchasing fewer

items overall, chooses a wider variety of brands rather than sticking to just one. Considering only the demographic variables, we can formulate our first hypothesis:

*H1a: Deal proneness increases with the age of the primary household shopper.*

Despite the previously discussed variables, they only account for roughly 15% of the variations seen in deal proneness. A subsequent paper by Blattberg et al. [5] suggested that the limited correlation might arise from the methods typically employed in these types of research. Commonly, numerous potential explanatory variables are compared against the percentage of deal-based purchases to identify statistically significant relationships. In Webster’s study [12], a staggering 200 regressions were performed using 45 different explanatory variables. The study argues that without a theory to indicate which variables should affect deal proneness can lead to misleading or coincidental findings. Blattberg, in contrast, grounded his approach in a model of household purchasing behavior. He advocated for the relevance of three main variables in influencing deal proneness: income, children, and the primary household shopper’s employment status.

Income, he suggested, directly correlates with a household’s resources. For instance, higher-income families are more likely to own homes and vehicles. Ownership of a home, particularly a house as opposed to an apartment, often equates to greater storage space. This can reduce storage-related costs for bulk purchases. Similarly, having a vehicle can simplify transportation, thereby decreasing associated costs and efforts. Both reduced storage and transactional costs can foster greater deal proneness.

Furthermore, Blattberg highlighted the time factor. The more available time a household has, the more prone they are to search for deals. Young children demand significant attention and effort, leaving their caregivers with limited spare time. Similarly, when both spouses are employed, particularly when the primary household shopper works, it shrinks the time available for scouting deals, impacting deal proneness. The following hypotheses can therefore be formulated:

*H1b: Deal proneness increases with income.*

*H1c: Deal proneness decreases with the number of children.*

*H1d: Deal proneness decreases as employment demands increase.*

In a subsequent study, Babakus et al. [4] delved into the factors influencing coupon usage. While confirming the significance of the variables highlighted by Blattberg, Babakus further emphasized the role of price consciousness and the inherent need for savings in driving coupon use. Specifically, he pointed out that family size, which often signals a household’s desire to economize on food costs, should be directly related to coupon usage. His findings revealed that households with more members were notably more inclined to use coupons compared to those with fewer members:

*H1e: Deal proneness increases with the household size.*

Levedahl [22] further examined the role of income and education level on deal proneness. He suggested and proved that individuals with higher income and education levels tend to be more attracted to deals compared to those with lower income and education. There are two main reasons for this observation. Firstly, the ”efficiency hypothesis” believes that households with more income or education are smarter shoppers, making them more skilled in using the benefits of discounts and coupons. Secondly, the ”reference/opportunities hypothesis” thinks that households with a higher income or educational background are more inclined to buy premium brands, which often provide coupons. As a result, these households are likely to redeem coupons more frequently:

*H1f: Deal proneness increases with the level of education.*

The impact of gender and age on deal proneness has shown mixed results in various studies. Regarding gender, most research suggests that women tend to be more prone to deals than men, mainly due to their extensive shopping experience [30][12]. For age, opinions among researchers are split. Some studies point out that older individuals have a stronger tendency towards deals, attributing this to their long-standing shopping experience [12]. In contrast, other studies highlight that younger individuals are more deal prone. This preference is based on the views of younger consumers, who see promotions as beneficial opportunities, either to get products at reduced prices or to receive free product samples or gifts [30]. Given the inconsistencies in findings related to the age variable, we will only formulate a hypothesis specifically addressing the impact of gender on deal proneness, while not formulating a hypothesis for the age variable:

*H1g: Women are more deal prone than men.*

Research on deal proneness has identified various factors, from demographics like age and gender to economic attributes like income and education, that influence a consumer's inclination to seek deals. While gender, age, income, education level and family size often show a significant impact on deal proneness, these insights only touch the basics. With only a fraction of promotional initiatives proving profitable, understanding the deep reasons behind deal-seeking behavior becomes essential.

With the rise of globalization, societal and cultural factors play an increasingly important role. The world is more connected than ever, and relying solely on demographic or economic markers no longer gives a full understanding. With frequent travels and multicultural exposures, consumers today have a mixed set of values and behaviors. O'Cass and Frost's [26] research highlighted the importance of culture in guiding responses to marketing strategies, emphasizing the need for a more comprehensive approach. Therefore, we will dive deeper into the concept of values in the next section.

## **2.3 Individual Values**

As mentioned in Chapter 1, values serve as fundamental cognitive beliefs guiding our attitudes and behaviors, setting the stage for understanding and predicting consumer patterns in a globalized world. We selected Schwartz's framework to study these values, a choice that was rationalized in Chapter 1. The different values are described in Table 1. In this section we will focus on the individual level values. The establishment of these values and why these values form a reliable framework is explained in Appendix 6.1.

National-Cultural Level	
Autonomy versus Embeddedness	This dimension reflects the extent to which individuals in a culture prioritize independence, self-direction, and personal achievement (autonomy) versus interdependence, social embeddedness, and maintaining the status quo (embeddedness).
Hierarchy versus Egalitarianism	This dimension reflects the extent to which individuals in a culture prioritize equality, fairness, and cooperation (egalitarianism) versus hierarchy, social power, and competition (hierarchy).
Mastery versus Harmony	This dimension reflects the extent to which individuals in a culture prioritize fitting in with the environment, avoiding conflict, and maintaining inner harmony (harmony) versus controlling the environment, mastering nature, and pursuing personal goals (mastery).
Individual level	
Self-Direction	Valuing independence, creativity, and freedom of thought and action.
Stimulation	Seeking excitement, novelty, and challenges in life.
Hedonism	Pursuing pleasure, enjoyment, and self-indulgence.
Achievement	Striving for personal success, demonstrating competence, and attaining goals.
Power	Seeking social status, influence, and control over others.
Security	Valuing safety, stability, and order in one's environment.
Conformity	Placing importance on following societal norms, traditions, and rules.
Tradition	Valuing customs, cultural heritage, and traditional beliefs.
Benevolence	Showing care, compassion, and concern for the welfare of others.
Universalism	Valuing equality, social justice, and the well-being of all people and nature.

Table 1: National-Cultural level and individual level values of Schwartz [33][36].

Before diving into interpreting consumer behavior through these values, it's important to explain how to interpret these values. In Figure 3, the 10 values are grouped under broader categories: openness to change vs. conservation and self-transcendence vs. self-enhancement. It's essential to understand that these values are linked [39]. For instance, if aging increases liking for conformity, it's probable that the significance of its opposite value, stimulation, would decrease. This interconnectedness can be summarized in two points:

1. External factors often impact neighboring value types in a similar manner.
2. Associations with any outside variable decrease monotonically as one goes around the circular structure of values in both directions from the most positively associated value to the least positively associated value.

By identifying primary associations between values and external variables, we can predict associations for all value types. The overall pattern of these associations, both significant and not, informs the validity of a given theory.

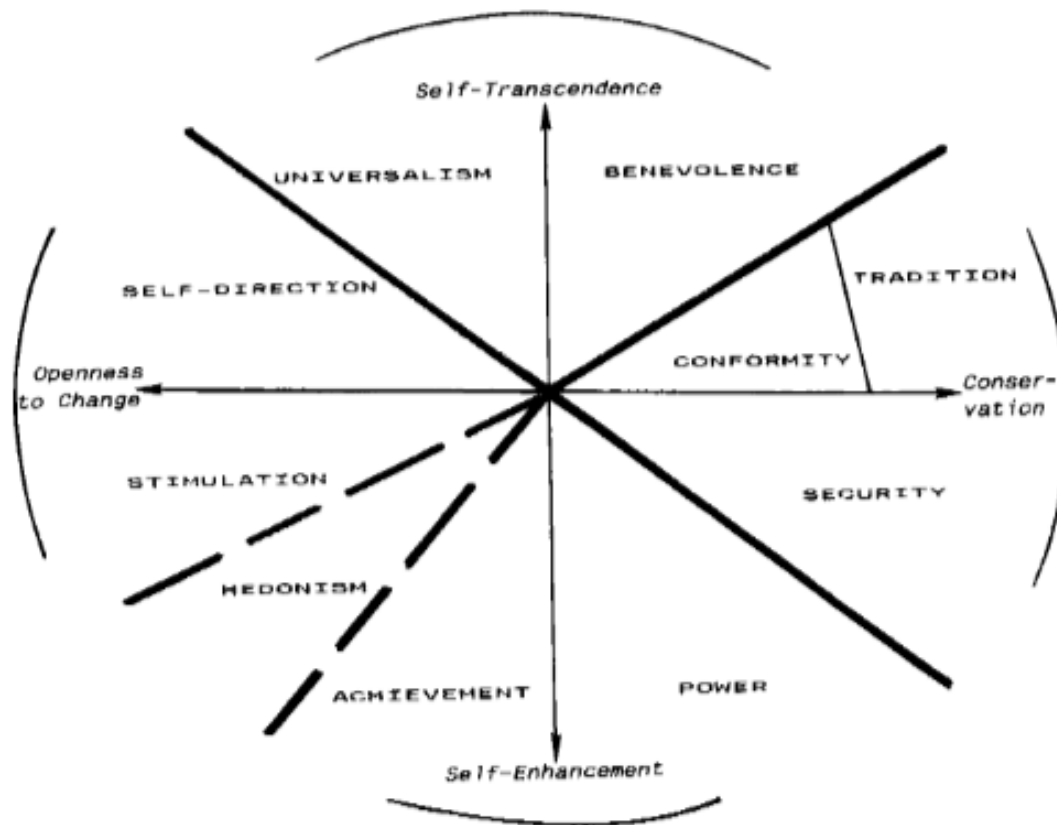


Figure 3: Circular structure of values [39]

Schwartz’s framework for individual values is a popular tool in analyzing human behavior. However, its application in understanding ”deal proneness” remains unexplored. To identify which values might correlate with deal proneness, we’ll focus on two studies: one exploring the link between the 10 values and frugal consumer habits, and the other examining their connection with shopping frequency.

Pepper et al. [27] examined the connection between frugal consumer behavior and Schwartz’s individual values. Highlighting this study is important as frugality and deal proneness both stem from a consumer’s intention to save money and find good value. The results from this research might shed light on how certain values relate to deal proneness.

The study reveals specific associations between frugality in purchasing and various values. Firstly, frugality is positively associated with conformity, tradition and universalism. This could be because people following conformity tend to follow long-standing societal beliefs and customs, which often view frugality as a positive trait passed on from one generation to the next. Meanwhile, universalism, which emphasizes the welfare of all and nature, could align with frugality due to the latter’s potential



for reduced consumption and thereby, a lower environmental impact [27].

Conversely, frugality is negatively associated with power, hedonism, and stimulation. Those who value power, often manifested through obvious consumption to display wealth and status, might view frugal behaviors as counterproductive to their social standing. Individuals prioritizing hedonism might avoid frugality as it can limit immediate pleasures and treats in luxury items or experiences. Lastly, people who seek stimulation, desiring new and thrilling experiences, might find frugality restrictive, as it typically involves financial restraint and avoids non-essential spending [27].

Only considering this study, the consumers valuing conformity, tradition, and universalism might lean towards deal proneness, seeing it as another way to save wisely and support societal or ethical beliefs about resource use. On the other hand, the negative associations with power, hedonism, and stimulation indicate that individuals who emphasize status, pleasure, and novel experiences might be less likely to show deal proneness, given that maximizing social standing, immediate pleasure, and novelty might sometimes require less concern for cost-saving.

While frugal consumers and deal-prone consumers both aim for savings, they approach purchasing differently. Frugal consumers prioritize needs over wants, often avoiding purchases they don't see as essential, even when faced with a tempting deal. They are careful researchers, ensuring they achieve long-term value from their purchases. On the other hand, deal-prone consumers are irresistibly attracted to sales and promotions, which can lead them to impulsive purchases of items they don't necessarily need, drawn by the immediate savings [27]. Given these differences, it's relevant to delve also into a study that focuses on the "need to shop" characteristic of deal proneness.

The study by Sevgili and Cesur [20] does this by examining the relationship between the individual values and the shopping frequency. Shopping frequency is related to deal proneness in multiple ways. The more frequently individuals shop, the more they're exposed to promotions, potentially building a habit of seeking the best deals. Regular shopping might be driven by budget constraints, encouraging a sharp eye for savings. This familiarity with market prices enables them to identify good bargains, and the excitement of securing a deal can offer a psychological boost. Moreover, the attraction of a special offer can often lead to impulse purchases.

The study's findings reveal a notable connection between Schwartz's value theory and the frequency of shopping. In particular, shopping regularly aligns positively with values of hedonism, achievement, and power. In contrast, values like universalism and benevolence show a negative link with shopping frequency. No clear correlation emerged between the frequency of shopping and the openness-to-change values, such as self-direction and stimulation [20].

The observed correlations could stem from various underlying reasons. People with strong hedonistic values might shop more frequently to satisfy their desire for pleasure and enjoyment, while those valuing achievement and power might shop often to attain and display status symbols. On the other hand, individuals with a strong sense of universalism and benevolence might prioritize collective well-being and thus shop less, focusing on essential needs rather than wants [20]. The lack of correlation with openness-to-change values suggests that the desire for novelty or autonomy doesn't necessarily dictate how often one shops. While shopping frequency may be seen as a routine task



not necessarily aligning with the values of stimulation and self-direction, deal proneness can be associated with the excitement, challenge, and autonomy that individuals seeking these values might appreciate. Therefore, we do expect a positive relationship between openness to change and deal proneness:

*H2a: Deal proneness increases with openness to change.*

Combining the findings from both studies [27][20] presents a conflicting view on the self-enhancement dimension (see Figure 3). The frugality-focused study suggests that values like hedonism, achievement, and power might be negatively related to deal proneness. In contrast, the study on shopping frequency might implies a positive relationship between these values and deal proneness. Yet, Babakus's research [?] indicates that customers often feel a sense of satisfaction and pride after buying with a coupon. This leads us to expect a positive correlation between the self-enhancement dimension and deal proneness, as the emotions of pride and satisfaction are partly tied to the values of hedonism and achievement:

*H2b: Deal proneness increases with self-enhancement.*

## 2.4 National-Cultural Values

As highlighted in Chapter 1, our study doesn't stop at examining individual values and their link to deal proneness. We're also exploring national cultural values and their relationship with deal proneness. National cultural values give us a broad view, capturing the overall tendencies of an entire nation, while individual values focus on personal motivations and beliefs. Even though diverse groups within a country might have varied individual values, the dominant cultural value remains consistent across these groups [33]. This makes the study of national cultural values especially useful when comparing values between countries.

In 2004, Schwartz broadened his values framework by introducing national cultural values, which are detailed in Table 1. The establishment of these national-cultural values and why these values form a reliable framework is explained in Appendix 6.2. Just like the ten individual values, these national cultural values are connected. They represent three contrasting dimensions that address common societal challenges: embeddedness vs. autonomy, hierarchy vs. egalitarianism, and mastery vs. harmony, as shown in Figure 4. It should be noted that the value 'autonomy' is splitted into two distinct parts; Intellectual autonomy encourages people to follow their own intellectual paths, while affective autonomy drives individuals to seek positive personal experiences. Societies tend to focus on one end of these dimensions while overlooking the other. For instance, American culture often highlights mastery and affective autonomy while giving less attention to harmony.

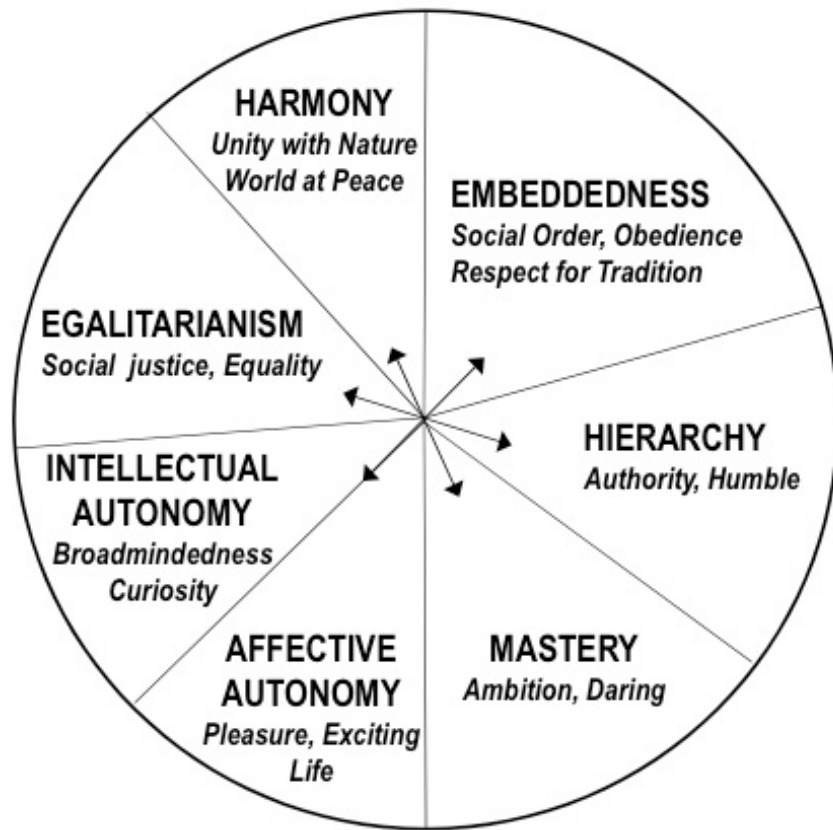


Figure 4: Circular structure of national cultural values [33]

Before delving into the potential relationships between national cultural values and deal proneness, it's crucial to highlight the connections between Schwartz's national cultural values and Hofstede's dimensions. Even though Schwartz's value structure is designed to illustrate cultural orientations that are either congruent (sitting adjacent in the circle) or opposing (located at a distance around the circle) [33] and Hofstede's dimensions are considered as independent [17], there are evident similarities between the two frameworks:

- The "autonomy/embeddedness" dimension shares conceptual basis with Hofstede's "individualism/collectivism". Both address individual-collective relations, but differ in their views on personal goals.
- Hofstede's "power distance" and the "egalitarianism/hierarchy" dimension both deal with social inequality but from different angles. Empirical data revealed only modest overlap
- "Mastery/harmony" has conceptual connections with Hofstede's "masculinity". Mastery involves an active approach but not necessarily selfishness. The empirical overlap between these dimensions is minimal.
- "Harmony" and "uncertainty avoidance" both idealize a harmonious order, but in different ways. The empirical overlap here is also limited.

Understanding the relationship between the national cultural values of Schwartz and other frameworks will help relating other cultural dimensions/values to the ones of Schwartz.

Kacen and Lee's study [19] explored how cultural values influence consumer impulsive purchasing habits. As highlighted in section 2.2, there's a connection between impulsive buying and deal proneness. The key takeaway from their research is that in countries with a stronger individualistic mindset, there was a clear connection between the characteristic of buying impulsiveness and the frequency of impulse purchases compared to more collectivist nations. The reasoning might be that individualistic nations prioritize personal freedom and choices, making people more inclined to follow their spontaneous desires. However, in collectivist societies, there's a tendency towards following societal norms and maintaining group cohesion, which might encourage individuals to hold back their impulsive tendencies [19]. Given that individualism is linked with Schwartz's "autonomy" cultural value, we anticipate a similar positive correlation between autonomy and deal proneness.

Another study by Sharma and Singh [40] also found a positive relationship between individualist countries and deal proneness. This explored the link between the cultural values of three countries (USA, Kenya, and Thailand) and deal proneness using Hofstede's framework. Besides for the individualism dimension, also relationships between the other dimensions and deal proneness were found. The findings and rationale are summarized below:

- Individualism and deal proneness: countries with a stronger individualistic orientation, like the USA, are more deal prone. Individualistic societies value personal freedoms and autonomy. Deals present a path for these individuals to enjoy personal benefits and cost savings, enabling decisions based on individual preferences rather than purely on cost considerations.
- Femininity index and deal proneness: countries with a high femininity index are more deal prone than their masculine counterparts. Feminine societies emphasize quality of life, close relationships, and supporting the vulnerable. As such, they may view deals as chances to provide and care for their families, maximizing their resources without excessive spending.
- Power Distance Index (PDI) and deal proneness: in countries with high PDI values, there's a reduced interest in deals. High PDI cultures value established hierarchies and clear social orders where each person has a distinct role. Seeking out deals might be perceived as an activity for those in lower levels, making it less appealing to the broader society.
- Uncertainty avoidance and deal proneness: Countries with high uncertainty avoidance are less deal prone. Cultures that heavily avoid uncertainty value stability and predictable structures. Deals, being temporary and representing deviations from the norm, might be approached with caution by individuals in these societies, cautious of unforeseen outcomes or risks [40].

In order to connect these findings with the national cultural values of Schwartz, we will use the earlier explained relationship between the dimensions of Hofstede and the national cultural values of Schwartz. Given the similar ideas behind "individualism/collectivism" and "autonomy/embeddedness", the observed trend of individualistic societies being more inclined towards deal proneness can be extended to suggest that societies valuing autonomy might also have a tendency towards deal proneness:

*H3a: Countries emphasizing autonomy are likely to exhibit higher deal proneness compared to countries emphasizing embeddedness.*

Similarly, looking at the connection between "power distance" and "egalitarianism/hierarchy", societies that favor hierarchical structures might show the same hesitation towards deals as those with high PDI values, possibly seeing deal-seeking as something done by those of lower status:

*H3b: Countries emphasizing egalitarianism are likely to exhibit higher deal proneness compared to countries emphasizing hierarchy.*

Moreover, countries that strongly favor mastery, showing an active and direct approach to the world, might reflect the observations related to masculinity in deal proneness. Here, feminine societies that focus on caring and building relationships might be more responsive to deals. Finally, when thinking about "harmony" in Schwartz's framework and "uncertainty avoidance" in Hofstede's model, we can guess that cultures valuing harmony, emphasizing peace and valuing their surroundings, might avoid deals if they see them as disturbing or possibly harming their societal peace and balance.

*H3c: Countries emphasizing mastery are likely to exhibit higher deal proneness compared to countries emphasizing harmony.*

## 2.5 Cross-Cultural Interactions

In the context of consumer behavior, cross-cultural interactions refer to the complex interaction between the collective norms and values that characterize different cultures, and the varied demographic profiles that describe the individuals within these cultures [14]. These interactions recognize that cultural norms do not impact all members of a culture equally; instead, they are influenced by demographic characteristics such as age, gender, income, education, and family size. Each individual's unique combination of demographic attributes can alter the way they interpret and respond to their culture's values.

Cross-cultural interactions emerge when we consider how demographic variables might moderate the expression of national-cultural values, leading to distinct behavioral patterns such as deal proneness. These interactions are crucial for understanding deal proneness in a globalized market, where demographic diversity and cultural values intersect to shape purchasing behaviors. By integrating demographic variables with national-cultural values, we suggest that demographic factors can either amplify or mitigate the influence of cultural values on deal proneness. This combined approach helps us move beyond broad generalizations to understand the subtle differences of consumer behavior within different cultural contexts.

In order to formulate hypotheses for the cross-cultural interactions, we will combine the information given in the section about the demographic factors (2.2) and the section about the national-cultural values (2.4). Using this information we can rationalize four different hypotheses:

- **Age and Autonomy:** As discussed in section 2.2, the relationship between the age variable and deal proneness was not straightforward. Earlier studies presented mixed results, making it challenging to draw a clear connection between age and the likelihood of seeking out deals. However, when we consider age in conjunction with national-cultural values, particularly

autonomy, a more nuanced relationship emerges. Younger generations in countries valuing autonomy may be especially prone to deals, as their pursuit of individual preferences aligns with the digital age’s focus on personalized consumption [30]. This tendency towards deal proneness in younger individuals could be due to their greater exposure to and comfort with digital technologies and online shopping platforms, which often offer a wide array of deals and discounts tailored to individual tastes and preferences. In such environments, the autonomy to choose and the attractiveness of personalized deals can significantly influence their purchasing decisions. Conversely, in countries that emphasize embeddedness, where collective values and traditional norms are more prevalent, younger generations might adhere more strongly to established consumption patterns, showing less tendency towards deal-seeking behavior:

*H4a: There is an interaction effect between age and autonomy on deal proneness, with younger individuals in countries valuing autonomy being more prone to deals compared to younger individuals in countries emphasizing embeddedness.*

- **Gender and Egalitarianism:** The influence of egalitarianism versus hierarchy on deal proneness may be nuanced by gender roles within a country. In more egalitarian countries, gender differences in deal proneness might be minimized as both men and women are encouraged to engage in deal-seeking behavior. On the other hand, in hierarchical countries, gender norms could play a more significant role in determining who engages in deal-seeking behaviors. It has been argued in section 2.2 that the primary household shopper tends to be more deal prone than those primarily working outside the home [12]. In hierarchical countries, there tends to be a clearer distinction in household roles, often along gender lines, with a more traditional separation of duties. This distinction can lead to more noticeable gender differences in deal proneness, as the role of the primary household shopper, often a role filled by women in these societies, may be more closely aligned with deal-seeking activities, while men working outside the household may be less engaged in such behaviors:

*H4b: There is an interaction effect between gender and egalitarianism on deal proneness, where gender differences in deal proneness are minimized in more egalitarian countries compared to hierarchical countries.*

- **Income, Education, and Mastery:** The relationship between income or education levels and the mastery versus harmony dimension can provide insights into deal proneness. In countries that value mastery, where assertiveness, ambition, and success are highly regarded, individuals with higher income or education may be more inclined to seek deals as a strategic means to enhance their status or achieve their personal ambitions. For those with higher socio-economic status in these countries, deals may represent opportunities to access higher-quality goods or services that align with their aspirations and lifestyle. The pursuit of deals in this context is consistent with the mastery culture’s focus on self-enhancement and success. Conversely, in societies that prioritize harmony, focusing on societal cohesion, environmental balance, and the well-being of the group, the pursuit of deals by individuals with higher income or education might be less intense. In these cultures, aggressive deal-seeking could be perceived as counterproductive to the values of community and collective responsibility. For individuals in these societies, particularly those with higher socio-economic status, the

emphasis might be more on making ethical or socially conscious choices rather than on aggressive deal-seeking behaviors for personal benefit:

*H4c: There is an interaction effect between income/education levels and mastery on deal proneness, where individuals with higher income or education in countries valuing mastery are more prone to deals compared to those in countries valuing harmony.*

- **Family Size and Embeddedness:** In embedded countries, larger families may be more inclined to seek out deals as a way to efficiently manage their resources. This behavior is not only about saving money; it's about ensuring that the family can maximize its collective resources. Deals and discounts are thus seen as opportunities to increase the family budget further, allowing for better support of the group as a whole. Deal proneness in this context is a reflection of the embedded value system that prioritizes communal goals and resource sharing. Conversely, in countries where autonomy is highly valued, the family's role in decision-making and consumption patterns may be different. Here, the impact of family size on deal proneness could be less significant. In autonomous countries, personal preferences and individual choices often have more influence over collective family considerations. As a result, larger families in these societies might not exhibit the same collective approach to deal-seeking. Instead, individual members are more likely to make purchasing decisions based on personal preferences and desires, rather than focusing on maximizing resources for the family as a whole.

*H4d: There is an interaction effect between family size and embeddedness on deal proneness, with larger families in more embedded countries being more prone to deals compared to those in countries valuing autonomy.*

## 2.6 Conceptual Framework

To illustrate the interconnections among the various variables discussed and to present a coherent structure for this study, Figure 5 offers a conceptual framework. This framework is organized into four distinct sections, with each box representing one or multiple variables. Notably, the box highlighting demographic variables is enclosed by dashed lines. This distinction signifies that the relationship between these variables and deal proneness is not the primary focus of this research. Instead, the emphasis lies on how these variables interplay with different values. Utilizing this framework and the anticipated interactions between its variables and deal proneness, we will now delve into the study's methodology.

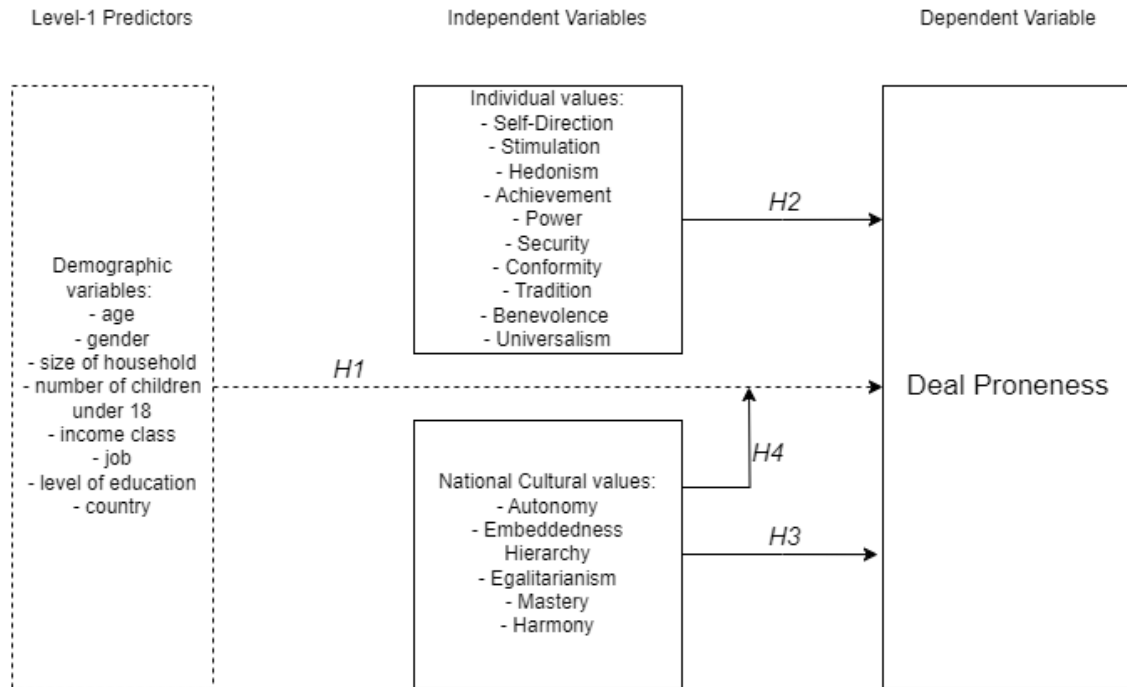


Figure 5: Conceptual Framework

### 3 Methodology

In this chapter, we will outline the methodology used to test our research hypotheses. We'll first describe the analytical approach and statistical methods applied in our study. Following this, we will provide an overview of the dataset utilized, detailing its characteristics and relevance to our research.

#### 3.1 Methodological Framework

As highlighted in Chapter 1, this study focuses on examining the impact of independent variables at two distinct levels on the dependent variable. To achieve this, we will employ two data analysis methodologies: multilevel regression and random forest.

##### 3.1.1 Multilevel Regression

Multilevel regression, also known as hierarchical linear modeling or mixed-effects modeling, is a statistical technique used for analyzing data that is structured at more than one level. It's particularly useful in situations where data points are nested within larger units, for example, students within schools, patients within hospitals, or in our case, individuals within countries.

The use of multilevel regression is justified for two main reasons when compared to single-level models. Firstly, multilevel regression addresses the statistical issue of data aggregation [18]. Single-level models often suffer from a loss of information and power due to the aggregation of data, resulting in



fewer data points at higher levels which can lead to less precise estimates. Multilevel models retain the detailed information available in the data by using all the individual data points available, thus avoiding the weakening of information and maintaining the robustness of statistical analysis.

Secondly, multilevel regression helps avoid conceptual errors that arise from analyzing data at one level while formulating conclusions at another, known as the fallacy of the wrong level. This occurs when aggregated data is used to make inferences about individual-level behaviors, which can lead to incorrect conclusions due to the difference between aggregated correlations and individual-level correlations. Multilevel models respect the hierarchical structure of the data and allow for correct inferences by modeling each level of data appropriately [18]. By taking into account these considerations, multilevel regression provides a more accurate and reliable analysis of data with nested structures, which is essential for our study of individuals within countries.

Transitioning from traditional regression models to multilevel regression corresponds to moving from a one-size-fits-all approach to a customized fit that accounts for group-specific characteristics. In a standard regression model, we estimate a single set of coefficients assumed to be constant across all observations, regardless of any group they might belong to. This assumes that every individual or country, depending on the level of analysis, behaves according to the same underlying relationship between the independent and dependent variables.

However, when we recognize that data is nested within groups, like individuals within countries, we need to account for the possibility that these relationships might vary by group. In a multilevel regression model, we allow the intercepts and slopes to vary across these groups. These varying intercepts and slopes are referred to as random coefficients. The intercepts can be thought of as the starting points for each group, while the slopes indicate how the relationship between the independent and dependent variables changes from one group to another. This is visualized in Figure 6.

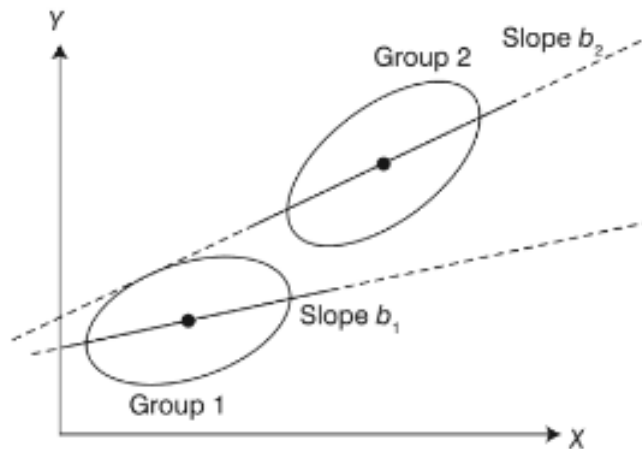


Figure 6: Multilevel regression model with varying intercepts and slopes ( $b_1$  and  $b_2$ ) [18].

By introducing variables at higher levels, we aim to explain some of the variation in these random



coefficients. If, for example, the slope for the relationship between age and deal proneness is different amongst the countries, we might introduce national-cultural values to explain why this difference exists. Instead of calculating the slope for each separate country, we can use the intra-class correlation coefficient (ICC). This measures the proportion of the total variance in the dependent variable that is attributable to the grouping structure [18]. A high ICC would indicate that a significant portion of the variability in deal proneness is due to differences between countries, which justifies the use of multilevel modeling.

The significance of the variance of the random component is another important aspect. If the random intercepts or slopes have significant variance, this indicates that there is indeed variation across groups that needs to be accounted for. Significant variance in the random intercepts suggests that the average level of the dependent variable differs by group, while significant variance in the random slopes indicates that the effect of an independent variable on the dependent variable differs across groups.

To illustrate the principles of multilevel modeling just discussed, we provide the formula for our study's two-level multilevel regression model, wherein deal proneness is the dependent variable:

Level-1 model for individual  $i$  in country  $j$ :

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + \epsilon_{ij}$$

Level-2 model for country  $j$ :

$$\begin{aligned}\beta_{0j} &= \gamma_{00} + \gamma_{01}W_j + u_{0j} \\ \beta_{1j} &= \gamma_{10} + \gamma_{11}W_j + u_{1j}\end{aligned}$$

Where:

- $Y_{ij}$  is the deal proneness for individual  $i$  in country  $j$ .
- $\beta_{0j}$  is the intercept for country  $j$  (the average deal proneness in country  $j$  when all level-1 predictors are 0).
- $\beta_{1j}$  represents the slope for the demographic variables and individual values for country  $j$ , indicating how these level-1 predictors affect deal proneness.
- $X_{ij}$  represents the demographic variables and individual values for individual  $i$  in country  $j$ .
- $W_j$  represents the national-cultural values for country  $j$ .
- $\epsilon_{ij}$  is the level-1 residual (the individual-level variance in deal proneness not explained by the level-1 predictors).
- $u_{0j}$  and  $u_{1j}$  are the level-2 residuals (the country-level random effects, indicating how much the intercept and slope, respectively, vary from the overall average).

In the context of our study, the significance and direction of the fixed coefficients  $\gamma_{00}$ ,  $\gamma_{01}$ ,  $\gamma_{10}$  and  $\gamma_{11}$  will help answer H1, H2, and H3 by showing the general effect of the demographic variables, individual values, and national-cultural values on deal proneness.

To address H4, which concerns cross-level interactions, we examine the variance of the random components  $u_{0j}$  and  $u_{1j}$  and the significance of the interaction effects in the model. If we find significant variance in  $u_{0j}$  or  $u_{1j}$ , it suggests that the effect of our level-1 predictors on deal proneness varies across countries. We introduce interaction terms into our model to test whether the relationship between individual-level predictors and deal proneness is moderated by country-level cultural values.

### 3.1.2 Random Forest

Alongside our multilevel regression analysis, we incorporate a random forest model to serve two purposes in our research. Primarily, we aim to investigate whether including nonlinear relationships in the model can enhance predictive accuracy. This is crucial as it may inform potential improvements in our multilevel regression analysis, including the introduction of new variables. Second, we seek to validate the significance of variables identified in the multilevel model by comparing them with those highlighted in the random forest analysis.

In our study, while the multilevel regression model offers valuable insights, it operates as a "white box" model, where the relationships between variables and outcomes are explicitly defined and interpretable. However, for predictive accuracy, we turn to the random forest model, which is a "black box" approach. This classification as a "black box" model stems from its complex internal decision-making process, which, while highly effective for prediction, does not readily reveal the specific ways in which the input variables are being combined and transformed to arrive at a prediction [29].

A random forest is essentially an ensemble of decision trees, each constructed using a subset of the data and a subset of the predictors, which enhances model robustness and predictive power. In our study consumer deal proneness is measured by a rating from 1 to 10. As depicted in Figure 7, the model constructs multiple decision trees, each drawing on a random subsample of the dataset that includes our independent variables: demographic variables, individual values, and national-cultural values. Each decision tree (Decision Tree-1, Decision Tree-2, ..., Decision Tree-N) independently assesses the data, branching out based on criteria that best separate the instances with different levels of deal proneness [7]. The trees grow by evaluating the Gini impurity of potential splits, aiming to categorize the instances into groups that are as homogenous as possible in terms of deal proneness [42]. Once the forest of trees has been established, each tree contributes a vote towards the final prediction. For our continuous outcome of deal proneness, the model averages the results of all trees (Result-1, Result-2, ..., Result-N) to determine the final prediction.

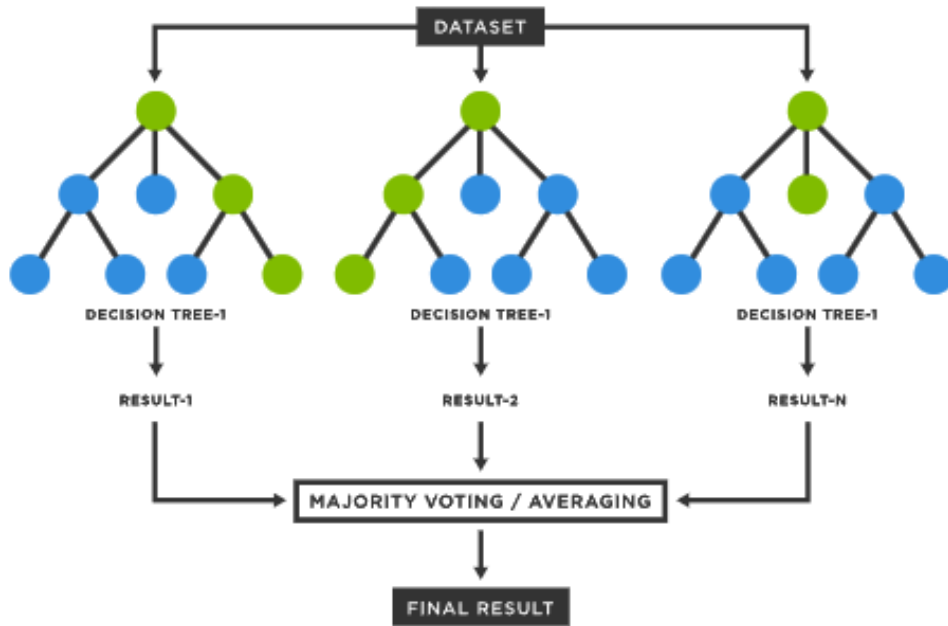


Figure 7: Example of Random Forest Model [2].

The advantage of a random forest in predictive accuracy arises from this diversity. Each tree in the forest makes its predictions based on a different subset of data and predictors, leading to a variety of models. When these individual predictions are aggregated, the errors of one tree are likely to be compensated by others, resulting in a more accurate overall prediction. This ensemble approach, combining multiple decision trees, tends to yield better predictive performance compared to a single decision tree or a white box model like multilevel regression, particularly when dealing with complex interactions and nonlinear relationships.

Variable importance in a random forest model is determined by observing the effect on the model's accuracy when each variable is randomly shuffled. This shuffling process, which disrupts the relationship between the variable and the outcome, leads to an increase in the model's prediction error if the variable is influential [7]. This increase is calculated for all trees in the forest and the average of this effect is known as the mean decrease in accuracy. It effectively measures the loss of predictive accuracy that occurs when the variable's data is omitted, providing a direct indicator of variable importance. Variables that lead to a larger mean decrease when excluded are considered more important for predicting the dependent variable.

### 3.2 Dataset Overview and Characteristics

We'll first examine the dataset that serves as the basis for our study. We'll detail its contents, including the demographic, individual values, and national-cultural variables. After presenting the dataset, we will proceed with some initial analyses to establish a basic understanding of the data's characteristics and the initial patterns observed, which will prepare us for the subsequent, more

advanced analyses and hypothesis testing.

### 3.2.1 Dataset Overview

Our analysis is based on a dataset about survey responses from 13,321 consumers across 28 different countries [43]. The survey, encompassing 178 diverse questions, captures a wide array of information, including demographic details like the number of children and education level. Additionally, it delves into personality, attitudes, and values through questions that span from buying behaviors to assessments of conduct, such as whether respondents engaged in theft during their youth. The responses are quantified numerically.

*Dependent Variable.* In our research, the dependent variable is consumer deal proneness. This variable is derived from the survey responses to two statements that assess attitudes toward deals and promotions. Participants were asked to rate their agreement with the statements "I love special promotional offers" and "Buying brands on offer makes me happy" on a scale where 1 indicates strong disagreement and 5 indicates strong agreement. To construct a comprehensive measure of deal proneness, we calculated the average of these two ratings for each respondent. This approach of averaging allows us to obtain a clear understanding of deal proneness, combining the excitement for special offers with the satisfaction derived from purchasing discounted brands.

*Demographic Variables.* To effectively test our hypotheses, we have chosen a variety of demographic variables. These variables, along with some descriptive statistics, are detailed in Appendix D. We made a decision to convert the variables *IncomeClass* and *EducationLevel* into numerical formats, recognizing that their respective categories represent different levels. For the variable *IncomeClass* we assigned a 1 to "lower class", 2 to "working class", 3 to "lower-middle class", 4 to "middle class", 5 to "upper-middle class", and 6 to "upper class". For the variable *EducationLevel* we assigned a 1 to "No formal education", 2 to "Education up to age 12", 3 to "Education up to age 14", 4 to "Education up to age 16", 5 to "Education up to age 18", 6 to "Higher education", and 7 to "University". Furthermore, it can be observed that every country is well represented.

*Individual Values.* As mentioned by Schwartz [32], each individual value is composed of a range of related attitudes. To determine the ten individual value scores for each respondent in our study, we calculate the average of the attitudes that correspond to each specific value. The detailed distribution of these attitudes across the different values is listed in Appendix 6.3. It's important to note that individuals and groups may vary in how they use the rating scale (from 1 to 10) when assigning importance to these attitudes. To account for these variations in scale usage, which can affect comparisons of value priorities across different cultural or demographic groups, we have included an additional column in our analysis. This column is the average importance rating assigned by each individual to the various attitudes. By incorporating this covariate in our comparisons of group means, or as a control variable in partial correlation analyses, we can statistically adjust for differences in scale usage, ensuring more accurate correlations between value priorities and other variables within groups [37].

*National-Cultural Values.* To incorporate the national-cultural values specific to each country in our dataset, we combined our data with the dataset provided by Schwartz [35], using the country as the merging criterion. Schwartz's dataset offers well-defined values for various countries, derived

from data collected through the 56-57 item Schwartz Value Survey conducted between 1988 and 2007. It is important to note that, based on extensive research across numerous countries, these national-cultural values tend to evolve very slowly, even in the presence of significant political and institutional changes [35]. Therefore, we can use this relatively older data.

*Additional Preprocessing.* The majority of the responses in our dataset are based on rating scales, which naturally limited the occurrence of significant outliers. However, we did encounter some missing data regarding the number of children for certain respondents from Japan. Given that all these respondents have a household size of one, we assumed that they likely do not have children. Consequently, we addressed these missing values by substituting them with zeros.

### 3.2.2 Initial Analysis

We begin our analysis by examining the direct influence of demographic variables and the values on deal proneness, not yet considering the country-based grouping of the data. This will provide initial insights at the individual level. Subsequently, we will analyze the data while recognizing its grouping into countries, which is the main purpose of this study.

*Individual-Level Analysis.* The details of the various variables, including minimum, maximum, mean, and median for numerical variables, along with counts for categorical variables, are provided in Appendix 6.4. From our initial observations, it appears that respondents in this survey generally place higher importance on individual values like self-direction and benevolence, while values such as power and tradition are rated lower. Moreover, at the country level, there is a noticeable preference for national-cultural values like intellectual autonomy and egalitarianism over embeddedness and hierarchy. This trend aligns with the circular structure depicted in the national-cultural values model (refer to Figure 4). The underrepresentation of African and Asian countries in our dataset might explain why we see these particular values. It suggests that the views from Western countries are more common in our data, while opinions from African and Asian regions are not as well represented.

Next, we'll explore the impact of the independent variables on deal proneness through correlation analysis. This will help us understand the strength and direction of the relationships between these variables and deal proneness. Additionally, we'll examine the interconnections among the variables themselves. The correlation matrix for the numeric demographic variables is given in Figure 8. Our analysis reveals that only age shows a slight negative correlation with deal proneness. For other variables, no significant correlation with deal proneness is apparent. The lack of significant correlations for most variables with deal proneness underscores the importance of considering the data as grouped. Additionally, we can identify expected correlations among some demographic variables: there's a strong positive correlation between the number of children and household size, and similarly, a strong positive relationship is observed between income class and education level.

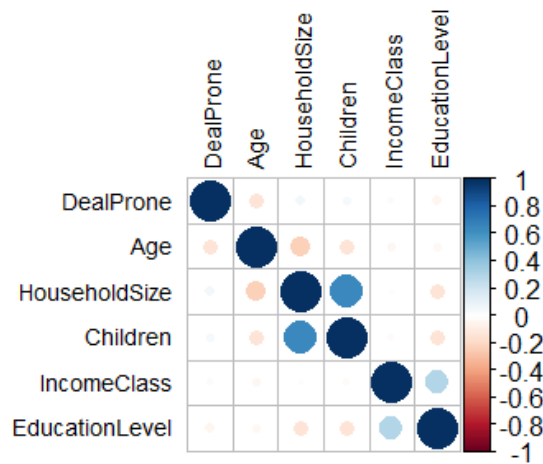


Figure 8: Correlation Matrix of Deal Prone and the Demographic Variables

To examine the influence of the categorical variables on deal proneness, we will use the boxplots shown in Figure 9. In these plots, the unfilled small black circles indicate the average deal proneness for each category. Statistical tests, including T-tests and ANOVA, confirm that the means across different categories are significantly different. However, the plots reveal that these differences are relatively small in magnitude. It is noticeable that females generally exhibit a marginally higher tendency towards deal proneness compared to males. In terms of occupation, homemakers appear to be the most inclined towards deal proneness, whereas the retired and the sick/disabled groups are the least, though there is greater variability within these groups, as indicated by the larger sizes of their respective boxes.

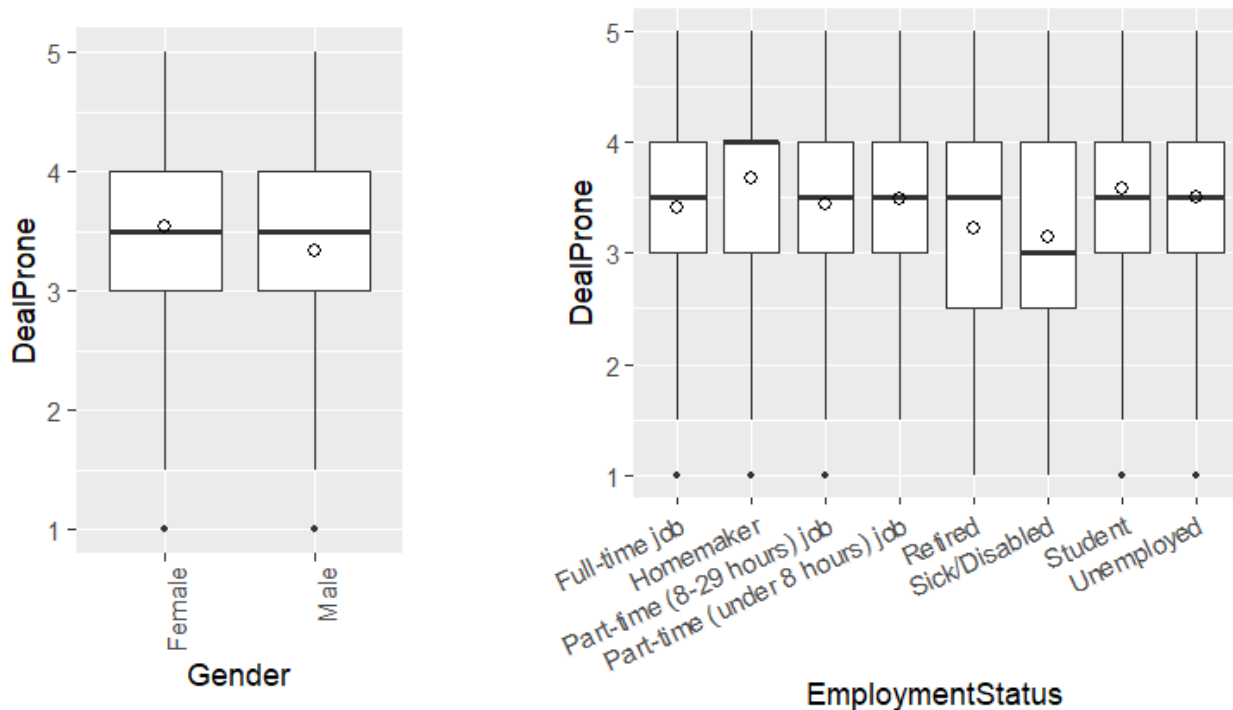


Figure 9: Boxplots of Categorical Variables

Figure 10 shows the correlation matrices for the individual values. To illustrate the importance of incorporating each respondent’s mean importance rating as a control variable in our analysis, we present correlation matrices both with and without this adjustment. In the matrix that accounts for the control variable, known as partial correlation, we observe patterns that align with expectations (refer to Figure 3). For instance, there is a negative correlation between Power and Universalism and Benevolence, and a (slight) positive correlation between Power and Achievement. However, these correlations are not as strongly opposed or as closely aligned as one might theorize. This could suggest that individuals may not view these values in strictly opposing terms. For example, someone might rate high on Power because they feel it is important for achieving their goals, but they might also rate relatively high on Universalism due to a personal belief that power should be used responsibly and for the greater good. Additionally, it is noteworthy that none of the individual values demonstrate a strong correlation with deal proneness.

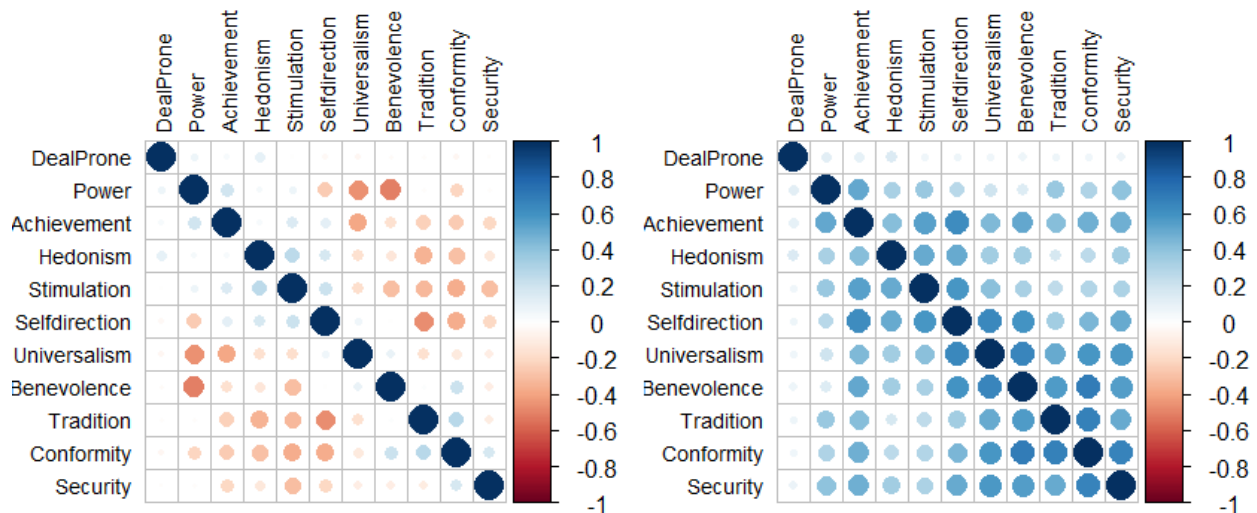


Figure 10: Correlation Matrices of Deal Proneness and Individual Values: with (left) and without (right) control variable

Lastly, the correlation matrix for the national-cultural values is presented in Figure 11. This matrix also reveals patterns that align with our theoretical expectations (see Figure 4). For instance, Intellectual Autonomy is strongly positively correlated with Affective Autonomy and Egalitarianism, while showing strong negative correlations with Embeddedness and Hierarchy. It’s also important to note that there are no substantial correlations between any of the national-cultural values and deal proneness. This observation suggests that examining the direct links between national-cultural values and deal proneness alone may not present significant insights.



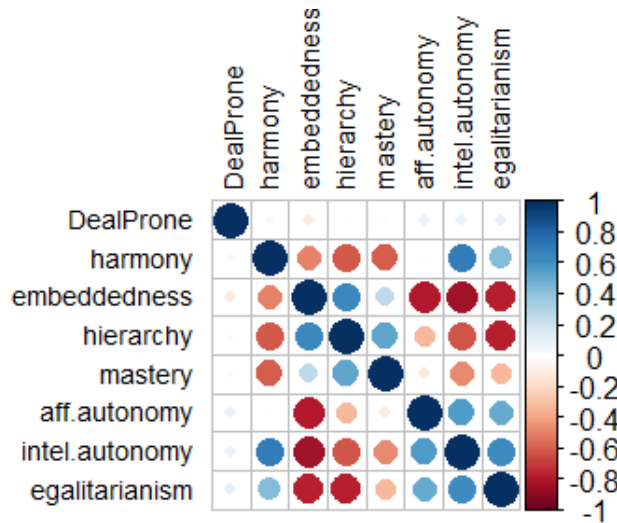


Figure 11: Correlation Matrix of Deal Proneness and National-Cultural Values

*Group-Level Analysis.* Our initial analysis at the individual level did not reveal significant correlations between most independent variables and deal proneness, though some variation was noted with categorical variables. Given that our dataset is grouped by countries, we now shift our focus to understanding how deal proneness varies across different countries and the role of independent variables in these variations.

The boxplots in Figure 12 illustrate the distribution of deal proneness across the countries. It's clear from the visualization that deal proneness indeed varies by country. An additional ANOVA analysis confirms that these differences in means (represented by white circles in the figure) are statistically significant. Notably, countries leaning towards the national-cultural value of Intellectual Autonomy, such as France, Germany, Switzerland, and Denmark (see Figure 25), are generally more deal-prone. On the other hand, countries with a stronger inclination towards Egalitarianism, like Norway and Sweden, exhibit lower levels of deal proneness.

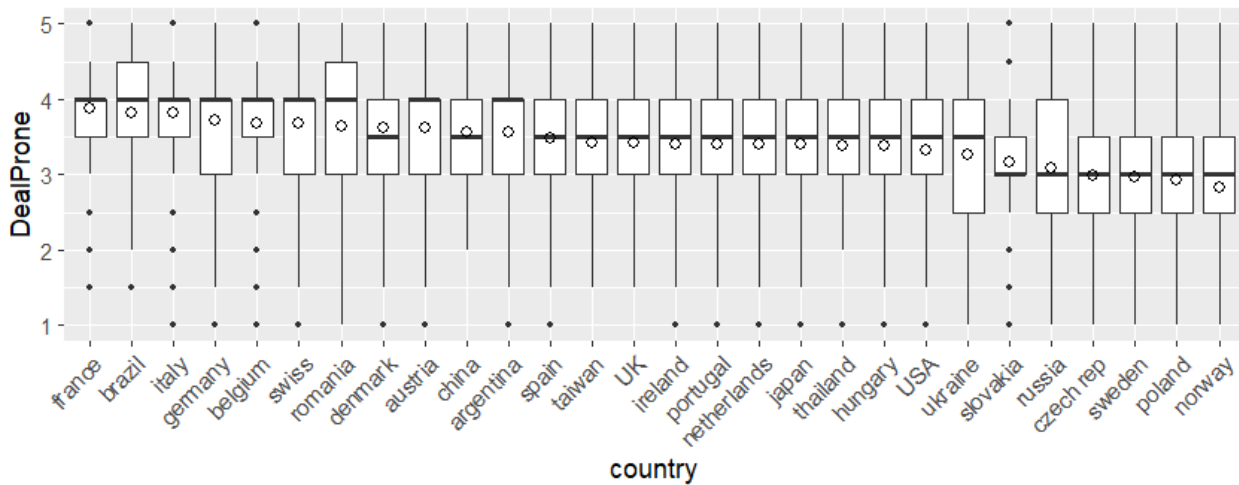


Figure 12: Boxplots of Deal Proneness and Countries



In order to get a first impression about the cross-cultural hypothesises (H4a-d), we will examine the interplay between their demographic and national-cultural variables. Hypothesis 4a suggests an interaction effect where younger individuals in countries valuing autonomy are more deal prone compared to their counterparts in countries with a focus on embeddedness. To test this, we compared France (a country leaning towards autonomy) and Thailand (more embedded in nature). Our analysis reveals a notable distinction: In France, there's a significant negative correlation between age and deal proneness (correlation coefficient:  $-0.3021854$ ), indicating that younger individuals are more inclined towards deals. Conversely, in Thailand, this age-related trend in deal proneness is not observed, as indicated by the non-significant correlation of  $0.01523091$ .

In Hypothesis 4b we argue an interaction effect where the difference in deal proneness between genders is less distinct in egalitarian countries compared to more hierarchical ones. To investigate this, we selected Belgium, known for its egalitarian values, and Taiwan, which tends towards a hierarchical structure. While Thailand shows a greater tendency towards embeddedness in comparison to Belgium, this distinction is relatively small when contrasted with the more pronounced difference they exhibit on the egalitarianism-hierarchy dimension. Furthermore, given that both countries have comparable scores on the harmony-mastery dimension, it can be reasonably assumed that the differences we observe are primarily attributable to their positions on the egalitarianism-hierarchy dimension. The boxplots for these countries, depicted in Figure 13, offer initial insights. In Belgium's case, while the boxplots for each gender show some differences, the mean deal proneness values for males and females are quite close, with a T-test confirming no significant difference between them. In contrast, Taiwan's boxplots appear more aligned, yet there's a significant difference in mean deal proneness between genders. These observations seem to support our hypothesis, suggesting that gender-related differences in deal proneness are indeed more marked in a hierarchical context like Taiwan, as opposed to the more egalitarian setting of Belgium.

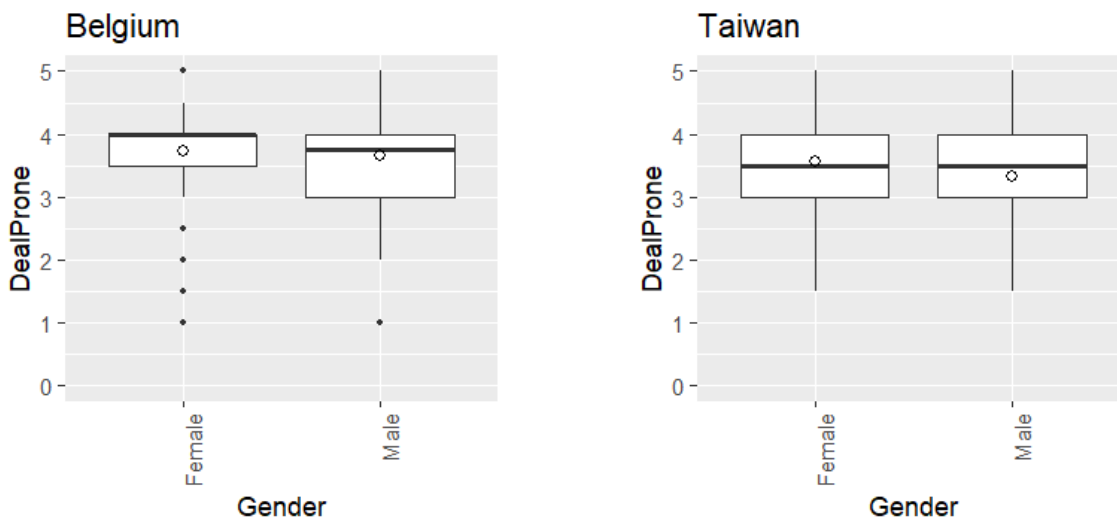


Figure 13: Boxplots of Deal Proneness and Countries \* Gender

Hypothesis 4c mentions the possibility of an interaction effect where individuals with higher income or education levels in countries valuing mastery are more inclined towards deals, as opposed to those

in countries with a preference for harmony. To evaluate this, we compared China, a country leaning towards mastery, and Germany, which tends more towards harmony. Given the strong correlation between education level and income level observed in our dataset (see Figure 8), we focused this preliminary analysis solely on education level. In China, the correlation between education level and deal proneness was found to be non-significant (correlation coefficient: 0.0706), whereas in Germany, a small but significant negative correlation of -0.116 was found. While Germany’s finding partially supports the hypothesis, the non-significant result from China and the modest magnitude of Germany’s correlation suggest that the relationship proposed in the hypothesis might be weak or perhaps even non-existent.

Hypothesis 4d examines whether there’s an interaction effect involving family size and embeddedness on deal proneness, suggesting that in more embedded countries, larger families tend to be more deal-prone compared to those in countries favoring autonomy. For this analysis, we will again use France, which leans towards autonomy, with Thailand, known for its embedded values. Our findings show a small but significant correlation between household size and deal proneness in France (correlation coefficient: 0.102), and an insignificant correlation, approximately 0, in Thailand. These observations do not support the initial hypothesis. Contrary to expectations, Thailand does not exhibit a positive correlation between larger household sizes and increased deal proneness. The following section will extend this investigation to include multiple embedded countries, which will help determine whether Thailand’s results are an outlier or if the hypothesized relationship generally does not hold.

## 4 Results

In this section, we delve into the core analyses of our study, primarily focusing on testing the hypotheses formulated earlier. We will begin by presenting and discussing the results obtained from the multilevel regression model. This will be followed by an in-depth exploration of the findings from the random forest model. While our primary objective is to evaluate the hypotheses, we will also highlight additional insights. Lastly, we will give an overview of the outcomes of our hypothesis testing.

### 4.1 Multilevel Regression Models

In our analysis, we constructed a series of multilevel regression models. This approach allowed us to thoroughly explore and understand the varying influences on deal proneness. We began our modeling with what is known as a "null model" (referred as M0 in Table 2). In multilevel analysis, the null model is crucial as it serves as a foundational baseline. It includes only the intercept and random effects, which are the countries in our case, excluding all other predictors. The Intraclass Correlation Coefficient (ICC) of the null model is calculated to be 0.1078. This value indicates that approximately 10.78% of the total variance in deal proneness can be attributed to differences between countries. The remaining variance, therefore, likely arises from individual-level differences or other factors not captured at the country level. This finding underscores the significance of country-level effects in our study and justifies the use of multilevel modeling to account for this hierarchical structure in the data.

In our subsequent model (M1), we introduced individual-level variables, including demographic variables and individual values. The inclusion of these variables is aimed at explaining variance at the individual level. The ICC remains relatively unchanged from the null model, which is an expected outcome. Since the ICC primarily quantifies variance between countries and M1 focuses on individual-level predictors, the between-country variance remains largely unaffected. The likelihood ratio test indicates that M1 fits the data significantly better than M0. This improvement in model fit, despite the stable ICC, is attributable to the individual-level variables accounting for more variance within each country, thereby improving the overall explanatory power of the model.

Further advancing our analysis, M2 incorporates national-cultural values. The addition of these variables is particularly crucial as they operate at the country level, directly influencing the between-country variance that the ICC captures. With M2, the ICC decreases to 0.0956. This reduction in the ICC reflects the explanatory power of national-cultural values, indicating that they account for a portion of the variance initially attributed to the differences between countries. The likelihood ratio test confirms that M2 provides a better fit than both M1 and M0. This improvement signifies that national-cultural values are determinants of deal proneness and are essential in explaining the differences observed across countries.

In the last four models (M3, M4, M5, M6) we added the four interaction terms, so Age:intel.autonomy, GenderMale:hierarchy, EducationLevel:harmony, and HouseholdSize:embeddedness respectively. We did not combine them because... The likelihood ratio test proved that only M3 and M4 provides a better fit than the other models. Later will be explained why this is the case.

Lastly, the models M3, M4, M5, and M6 introduced specific interaction terms: Age:intel.autonomy in M3, GenderMale:hierarchy in M4, EducationLevel:harmony in M5, and HouseholdSize:embeddedness in M6. We chose not to combine these interaction terms to better understand its unique contribution to the model. The likelihood ratio test revealed that only M3 and M4 provide a better fit compared to the previous models. In the subsequent paragraphs it will be clear why this is the case.

Table 2 presents the unstandardized regression coefficients for each of our models. The consistency in parameter estimates observed across various model specifications reinforces the reliability of our findings. Therefore, our subsequent analyses and discussions will predominantly focus on M2, except where specified otherwise.

*Demographic Variables.* Our analysis of demographic variables has identified several significant predictors of deal proneness. Age shows a negative coefficient, suggesting a tendency for deal proneness to diminish with increasing age. This could imply that younger individuals are more inclined to pursue deals than their older counterparts. Regarding gender, the negative coefficient for GenderMale indicates that men are generally less likely to be deal-prone compared to women. This finding support our Hypothesis **H1g**. In terms of employment status, homemakers stand out with a positive coefficient, highlighting a greater likelihood of being deal-prone. Furthermore, when we added the interaction of EmploymentStatusHomemaker and Age to the model, we found a significant coefficient of 0.0091. The positive coefficient indicates that as age increases, the likelihood of being deal-prone increases more for homemakers than it does for full-time employees (reference

category), which aligns with our Hypothesis **H1a**.

However, our Hypothesis **H1d**, which proposes a decline in deal proneness with greater employment demands, receives only partial support. This is because not all employment statuses less demanding than full-time work show a positive relationship with deal proneness. Lastly, the status of being sick or disabled is associated with a negative coefficient. Individuals in this category are less deal-prone, which may result from constraints such as limited mobility. Demographic factors that did not show significance in our model do not support our corresponding hypotheses, leading to their rejection.

*Individual Values.* Within our investigation of individual values and their relationship with deal proneness, we argued that values associated with Openness to Change and Self-Enhancement would positively influence deal proneness. Table 2 supports our hypothesis regarding Self-Enhancement (**H2b**), with Power, Achievement, and Hedonism exhibiting positive and significant coefficients, signaling an increase in deal proneness in line with these values. Contrary to expectations, the values categorized under Openness to Change, namely Selfdirection and Stimulation, demonstrate significant but negative associations with deal proneness. This outcome requires the rejection of Hypothesis **H2a**, as it suggests an inverse relationship where an increase in these values leads to a decrease in deal-seeking behavior. It is plausible that individuals who score high on Openness to Change place a greater emphasis on experiences and personal growth, which might not always align with the motivations behind deal-seeking. Besides that, we can see a positive coefficient on the value Security, which is in line with the theory that opposing values should have different directions. A reason for that can be that those who value Security may seek deals as a way to mitigate financial uncertainty.

*National-Cultural Values.* As it can be observed from Table 2 all the national-cultural value variables are insignificant. Consequently, this leads to the rejection of Hypothesis **H3a-c**. An explanation for this can be that these values might interact with other variables in ways that are not captured by the current model. The impact of these values could be moderated by other demographic or individual value variables, leading to their direct effects being non-significant. The country-specific nature of these national-cultural values suggests that solely relying on a singular national-cultural value might not sufficiently explain variations in deal proneness. A more nuanced approach that combines these cultural values with other relevant variables could offer deeper insights. This strategy will be explored and elaborated upon in the following paragraphs.

*Cross-Cultural Interactions.* As mentioned in Hypothesis **H4a-d**, we specifically analyzed the interplay between four demographic factors and national-cultural values. Among the interactions studied, two have emerged as statistically significant. The significant negative coefficient of -0.0050 in Age:intel.autonomy suggests a relationship between age and intellectual autonomy in their combined effect on deal proneness. As age increases, the influence of intellectual autonomy on deal proneness appears to decrease. This interaction might indicate that older individuals, despite valuing intellectual autonomy, are less influenced by this value in their deal-seeking tendencies compared to younger individuals, which supports Hypothesis **H4a**.

Furthermore, our analysis revealed a significant positive coefficient of 0.1162 for the interaction term GenderMale:hierarchy. Contrary to our initial Hypothesis **H4b**, this finding indicates that in more

hierarchical societies, men exhibit a greater increase in deal proneness compared to women, who are in less hierarchical (or more egalitarian) settings. This outcome contrasts with our hypothesis, which anticipated a negative coefficient to suggest that women would be more deal prone in hierarchical countries. One potential explanation for this unexpected result could be attributed to the traditional economic roles of men in a hierarchical society. The societal role could drive them to be more active in seeking deals as a way of fulfilling their culturally assigned duties of managing finances.

The other interactions studied, namely EducationLevel:harmony and HouseholdSize:embeddedness, did not yield significant results. While these interactions were hypothesized to have a notable impact on deal proneness, the lack of statistical significance suggests that their influence might be more subtle or potentially overshadowed by other factors in our model.

Variables	M0	M1	M2	M3	M4	M5	M6
Intercept	<b>3.42668</b>	<b>3.2130</b>	<b>-8.1010</b>	9.2540	-8.0640	-7.8210	-8.2400
<b>Demographic Variables</b>							
Age		<b>-0.0068</b>	<b>-0.0068</b>	<b>0.0157</b>	<b>-0.0066</b>	<b>-0.0068</b>	<b>0.0068</b>
GenderMale		<b>-0.1964</b>	<b>-0.1971</b>	<b>-0.1890</b>	<b>-0.4503</b>	<b>-0.1969</b>	<b>-0.1972</b>
HouseholdSize		0.0018	0.0020	0.0023	0.0028	0.0020	0.0389
Children		0.0074	0.0071	0.0070	0.0071	0.0071	0.0062
IncomeClass		0.0044	0.0042	0.0057	0.0049	0.0042	0.0042
EmploymentStatusHomemaker		<b>0.1166</b>	<b>0.1163</b>	<b>0.1166</b>	<b>0.1266</b>	<b>0.1162</b>	<b>0.1169</b>
EmploymentStatusPart-time (>8h)		-0.0036	-0.0042	-0.0047	-0.0100	-0.0041	-0.0048
EmploymentStatusPart-time (<8h)		0.0438	0.0434	0.0433	0.0426	0.0431	0.0439
EmploymentStatusRetired		-0.0167	-0.0164	-0.0221	-0.0171	-0.0163	-0.0167
EmploymentStatusSick/Disabled		<b>-0.1535</b>	<b>-0.1549</b>	<b>-0.1527</b>	<b>-0.1597</b>	<b>-0.1543</b>	<b>-0.1552</b>
EmploymentStatusStudent		-0.0071	-0.0076	-0.0145	-0.0081	-0.0075	-0.0079
EmploymentStatusUnemployed		0.0289	0.0287	0.0284	0.0274	0.0290	0.0285
EducationLevel		-0.0075	-0.0076	-0.0070	-0.0083	-0.0510	-0.0077
<b>Individual Values</b>							
Power		<b>0.0489</b>	<b>0.0493</b>	<b>0.0489</b>	<b>0.0492</b>	<b>0.0493</b>	<b>0.0493</b>
Achievement		<b>0.0265</b>	<b>0.0267</b>	<b>0.0265</b>	<b>0.0274</b>	<b>0.0266</b>	<b>0.0267</b>
Hedonism		<b>0.0404</b>	<b>0.0399</b>	<b>0.0381</b>	<b>0.0399</b>	<b>0.0398</b>	<b>0.0398</b>
Stimulation		<b>-0.0163</b>	<b>-0.0163</b>	<b>-0.0161</b>	<b>-0.0162</b>	<b>-0.0162</b>	<b>-0.0163</b>
Selfdirection		<b>-0.0394</b>	<b>-0.0394</b>	<b>-0.0391</b>	<b>-0.0398</b>	<b>-0.0394</b>	<b>-0.0393</b>
Universalism		-0.0066	-0.0068	-0.0058	-0.0075	-0.0068	-0.0066
Benevolence		<b>0.0189</b>	0.0184*	0.0181*	0.0172*	0.0183	0.0184
Tradition		-0.0085	-0.0084	-0.0087	-0.0077	-0.0083	-0.0085
Conformity		0.0011	0.0012	0.0013	0.0019	0.0013	0.0012
Security		<b>0.0349</b>	<b>0.0353</b>	<b>0.0364</b>	<b>0.0354</b>	<b>0.0355</b>	<b>0.0352</b>
<b>National-Cultural Values</b>							
harmony			0.3290	0.3481	0.3332	0.2657	0.3319
embeddedness			0.5544	0.5771	0.5569	0.5514	0.5903
hierarchy			0.2768	0.2820	0.2128	0.2726	0.2778
mastery			0.5528	0.5629	0.5651	0.5568	0.5512
aff.autonomy			0.3361	0.3499	0.3332	0.3357	0.3391
intel.autonomy			0.2026	0.3927	0.2084	0.2042	0.2008
egalitarianism			0.6374*	0.6410*	0.6386*	0.6329*	0.6376*
<b>Interaction</b>							
Age:intel.autonomy				<b>-0.0050</b>			
GenderMale:hierarchy					<b>0.1162</b>		
EducationLevel:harmony						0.0105	
HouseholdSize:embeddedness							-0.0103

Table 2: Estimates of Effects on Deal Proneness

Notes: Parameter estimates in bold are significant at  $p < .05$  and with a '\*' at  $p < .1$

## 4.2 Random Forest Model

Turning our attention to the random forest model, we delve into a more complex analytical approach known for its capacity to handle nonlinear relationships. This characteristic often makes the random forest model more accurate in capturing intricate data patterns compared to linear models, such as multilevel regression. Before diving into the new insights gained from the random forest model, we'll first evaluate its performance. Additionally, we'll examine if the important variables identified by this model align with those from the multilevel regression model. This step will help us understand the consistency between the two modeling approaches.

*Performance.* To assess the performance of our random forest model, we divided our dataset into training and testing sets with an 80%/20% split. This split was done to maintain a similar distribution of national-cultural value scores in both sets, ensuring a consistent country proportion. We trained the random forest model on the training set using all variables, except for 'country', since the variance typically associated with countries is expected to be captured by the national-cultural values. The model was then used to predict the dependent variable, deal proneness, on the unseen data (testing set). These predictions were compared with the actual values to measure model accuracy. two different metrics will be used to evaluate the model's performance:

- Mean Squared Error (MSE): MSE is the average of the squares of the differences between the predicted and actual values. It measures the quality of the model's predictions, with a lower MSE indicating more accurate predictions.
- Percentage of Variance Explained: This metric reflects the proportion of the outcome variable's variance that is explained by the model. A higher percentage indicates that the model can explain a greater portion of the variability in the data, signifying a better fit to the observed data.

	Training Set	Test Set
MSE	0.315	0.324
% Variance explained	55.59	37.70

Table 3: Performance of Random Forest Model

In Table 3, the mean squared error values for both the training and testing sets are similar, suggesting that our model performs consistently across both datasets. This indicates good generalization capabilities, as it shows the model is not overly tailored to the training data alone. The R-squared value, which stands at 55.59% for the training set and drops to 37.7% for the test set, points to a moderate predictive strength. Although the model successfully accounts for a substantial part of the variance in the data, there remains a notable proportion that it does not explain.

*Variable Importance.* Now we know what the random forest model's performance is, we will look at the variable importances. In Figure 14 the various variable importances are shown. We used the IncNodePurity to determine these importances. These importances align with the significant coefficients of the multilevel model. For example, Power, Hedonism and Age are the most important variables for the random forest and are also significant coefficients in the multilevel model. This



shows the consistency between these two models. Surprisingly, the variable Gender is one of the least important variables in the random forest model, but a significant one in the multilevel model. *Variable Importance*. With the performance of the random forest model established, we now turn our attention to the variable importances, as illustrated in Figure 14. These importances were determined using the Increase in Node Purity (IncNodePurity) method, which measures how much each variable contributes to the homogeneity of the nodes in the model’s trees. This approach reflects the extent to which each variable improves the model’s accuracy.

The variables identified as most important in the random forest model, such as Power, Hedonism, and Age, also appear as significant coefficients in the multilevel model. This relation underscores a consistency in the findings of the two modeling approaches. However, one notable difference is observed with the variable Gender, which, despite being a significant predictor in the multilevel model, ranks as one of the least important variables in the random forest model. One reason for Gender’s significance in the multilevel model but not in the random forest could be due to its interaction with other variables. In the multilevel model, Gender might interact in a linear manner with other variables. However, in the random forest, which captures complex, non-linear relationships and interactions, the influence of Gender could be absorbed by more intricate interactions, thus reducing its standalone importance.

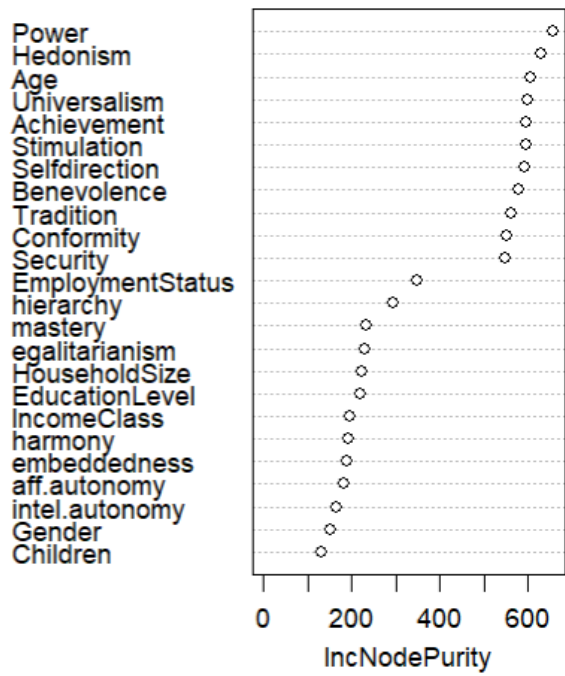


Figure 14: Variable Importance of the Random Forest Model

*Interactions*. The nature of a random forest model as a "black box" means that it's not immediately clear which variables and interactions it employs for specific predictions. To uncover the interactions utilized by the random forest model, we will employ two distinct methods.

Our first approach involves utilizing Friedman’s H-statistic, a tool designed to quantify the strength

of interactions between pairs of features. Table 4 presents the results of this interaction analysis within our random forest model. Higher values of the H-statistic suggest stronger interaction effects between those features. The 'Age' feature appears to have significant interaction effects with several features. We previously explored the interaction between age and the embeddedness-autonomy dimension. However, it appears that Age also interacts significantly with other dimensions of national-cultural values. Additionally, the random forest analysis reveals notable interactions between Age and individual values such as Power and Hedonism, further indicating that the influence of Age on the predicted outcome is variable, shaped by these additional variables.

Furthermore, the interaction between the two national-cultural values mastery and egalitarianism is noteworthy. As the results of the multilevel model showed no significant effect for the national-cultural values, it is interesting that this interaction is important in the random forest model.

Interaction		H-statistic
Age	egalitarianism	0.2170649
Age	Power	0.2029698
Age	Hedonism	0.1939319
Age	mastery	0.1884129
Age	Gender	0.1791245
mastery	egalitarianism	0.1717412
Age	embeddedness	0.1671992
Age	Achievement	0.1616127
Age	Universalism	0.1601671
Power	egalitarianism	0.1595228

Table 4: H-statistic of top 10 interaction variables of random forest.

Our second method for understanding the interactions within the random forest model involves the use of a surrogate model, specifically a decision tree. In creating a surrogate decision tree from a random forest model, the tree is trained on the predictions made by the random forest, thereby translating its complex decision-making process into a simpler, more interpretable form that reflects the broader trends and relationships captured by the random forest. The optimized decision tree is depicted in Figure 15. Within this surrogate model, we once again notice the interaction between mastery and egalitarianism. Interestingly, despite its low ranking in the variable importance list of the random forest model, the variable Gender emerges in the decision tree. This difference could be due to the decision tree's simplified representation capturing dominant trends or splits, which might not be as prominent in the random forest's more comprehensive analysis.

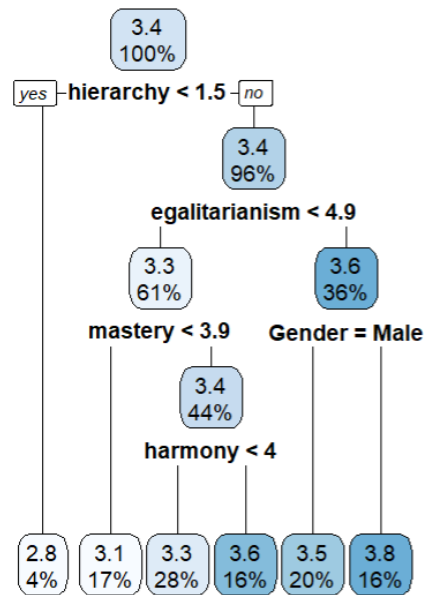


Figure 15: Surrogate Decision Tree Model of Random Forest

*Additional Analysis.* Finally, we will further substantiate our hypotheses and offer extra insights through 3D plots that effectively illustrate interaction effects. These plots are constructed by generating predictions on a grid of values for the interacting variables, allowing us to visualize the complex relationships between them. Beginning with Hypothesis **H4a**, which highlights the interaction between Age and Intellectual Autonomy. Figure 16 effectively confirms this interaction. The plot demonstrates that younger individuals in countries with higher levels of intellectual autonomy (marked by a red circle) exhibit a greater propensity for deal-seeking compared to their counterparts in less autonomous (or more embedded) countries.

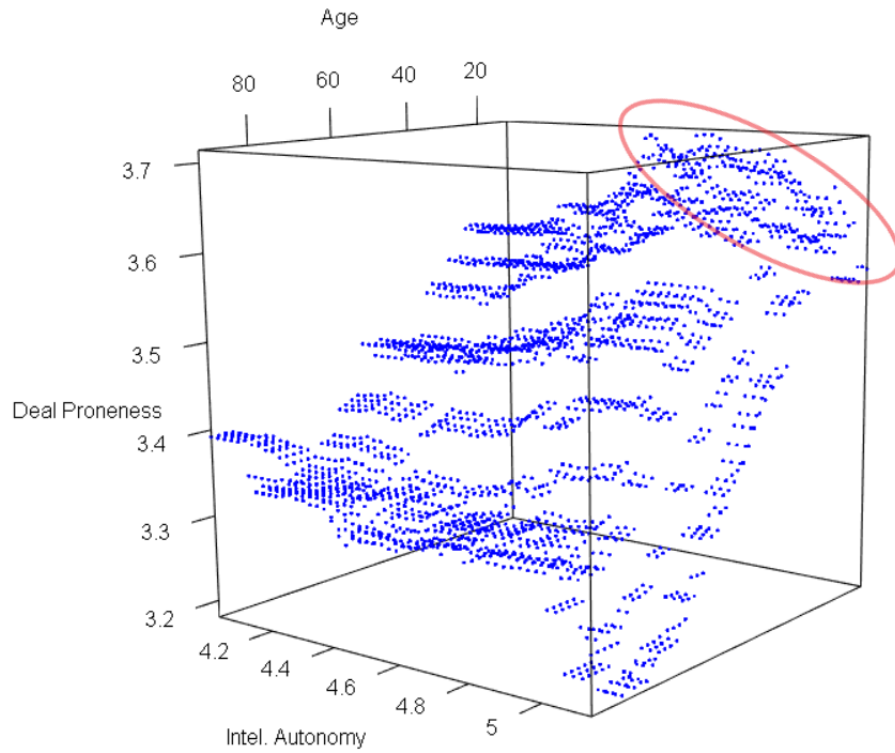


Figure 16: Interaction effect analysis of Intellectual autonomy and Age

Secondly, we investigated the interaction between household size and embeddedness, which is mentioned in Hypothesis **H4d**. Although this interaction was not significant in the multilevel model, we found an interesting result in Figure 17. We observed that deal proneness tends to increase with household size, peaking at around a household size of approximately 5 (indicated by the red arrow).

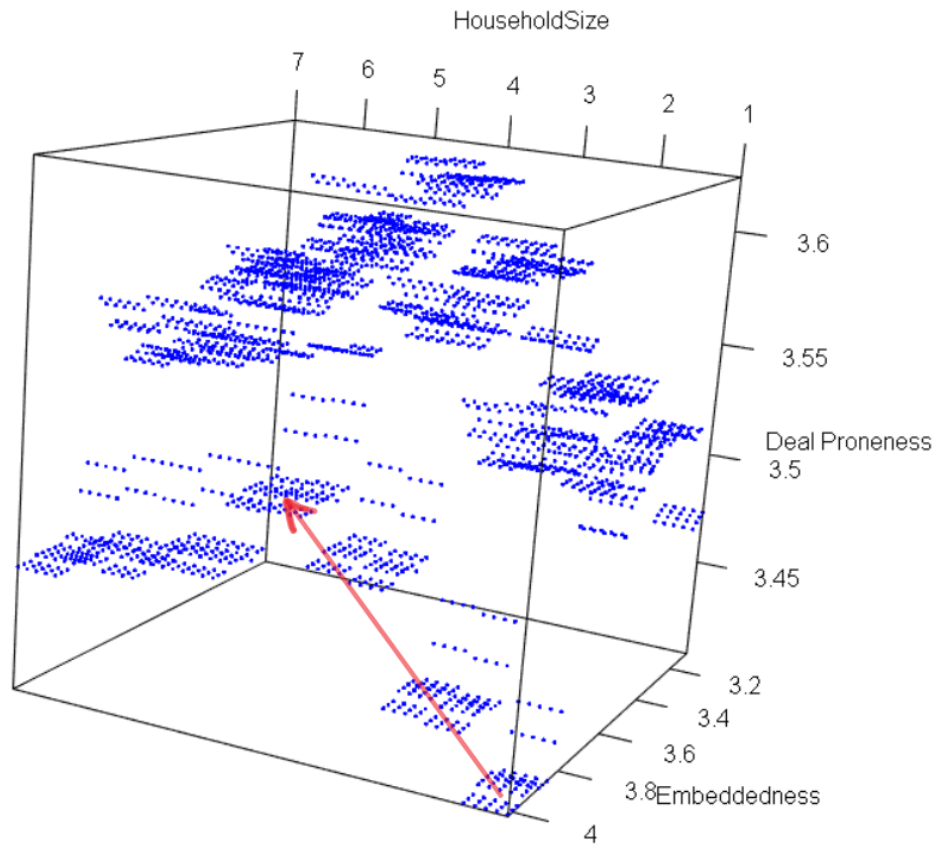


Figure 17: Interaction effect analysis of Embeddedness and HouseholdSize

In examining the sole impact of household size on deal proneness, we note a similar increasing trend in deal proneness up to a household size of around 5, as depicted in Figure 18. This figure represents a partial dependence plot, which visually demonstrates the relationship between a single predictor (in this case, household size) and the predicted outcome, averaged over the distribution of other variables in the model. This trend suggests that up to a certain point, larger households may have both the opportunity and motivation to seek more deals, potentially due to greater collective savings and efficient resource utilization. However, beyond a household size of 5, deal proneness appears to decline, possibly because the increasing demands on time and resources make it more challenging to actively seek deals.

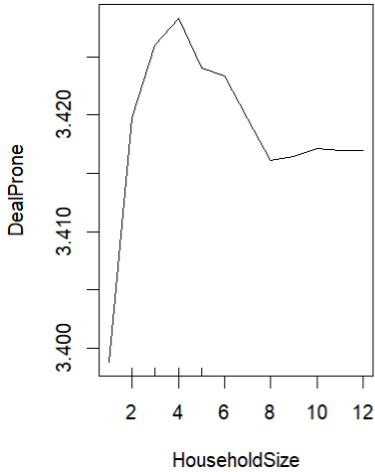


Figure 18: Partial Dependence Plot of Household Size

Finally, our analysis focuses on the interaction effect between egalitarianism and mastery. This particular interaction was highlighted both in the Friedman’s H-statistic analysis and the surrogate decision tree model. As depicted in the 3D plot in Figure 19, a significant interaction effect is indeed evident. The plot shows that deal proneness is relatively higher in contexts where egalitarianism is high and mastery is low, as indicated by the red circle. Conversely, in settings where mastery is high but egalitarianism is low, marked by the green circle, deal proneness is also observed to be high. This is likely because the emphasis on mastery, with its focus on achievement and dominance, encourages competitive behaviors like deal-seeking as a way to demonstrate success. The lower priority given to egalitarian values in these settings may further enhance individualistic and competitive approaches to securing deals, thereby increasing overall deal proneness.

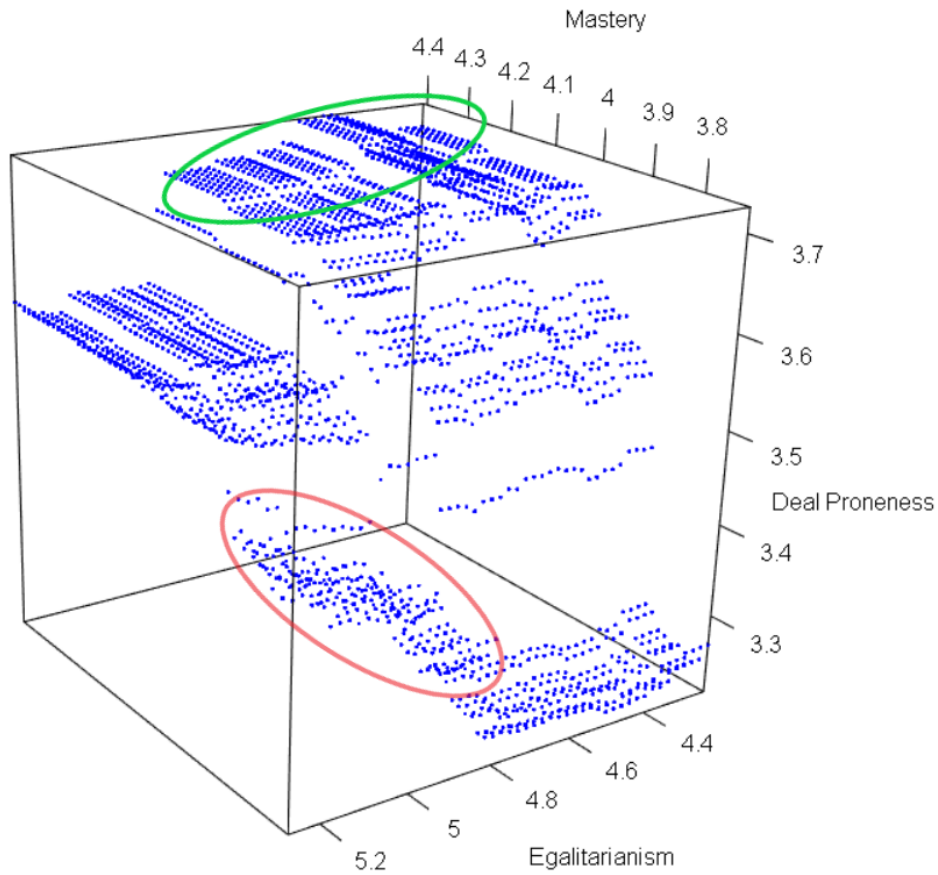


Figure 19: Interaction effect analysis of Egalitarianism and Mastery

### 4.3 Hypothesis Outcomes

Hypothesis	Result
H1a: Deal proneness increases with the age of the primary household shopper.	Accepted
H1b: Deal proneness increases with income.	Rejected
H1c: Deal proneness decreases with the number of children.	Rejected
H1d: Deal proneness decreases as employment demands increase.	Partly Accepted
H1e: Deal proneness increases with the household size.	Partly Accepted
H1f: Deal proneness increases with the level of education.	Rejected
H1g: Women are more deal prone than men.	Accepted
H2a: Deal proneness increases with openness to change.	Rejected
H2b: Deal proneness increases with self-enhancement.	Accepted
H3a: Countries emphasizing autonomy are likely to exhibit higher deal proneness compared to countries emphasizing embeddedness.	Rejected
H3b: Countries emphasizing egalitarianism are likely to exhibit higher deal proneness compared to countries emphasizing hierarchy.	Rejected
H3c: Countries emphasizing mastery are likely to exhibit higher deal proneness compared to countries emphasizing harmony.	Rejected
H4a: There is an interaction effect between age and autonomy on deal proneness, with younger individuals in countries valuing autonomy being more prone to deals compared to younger individuals in countries emphasizing embeddedness.	Accepted
H4b: There is an interaction effect between gender and egalitarianism on deal proneness, where gender differences in deal proneness are minimized in more egalitarian countries compared to hierarchical countries.	Rejected
H4c: There is an interaction effect between income/education levels and mastery on deal proneness, where individuals with higher income or education in countries valuing mastery are more prone to deals compared to those in countries valuing harmony.	Rejected
H4d: There is an interaction effect between family size and embeddedness on deal proneness, with larger families in more embedded countries being more prone to deals compared to those in countries valuing autonomy.	Rejected



## 5 Conclusions and Limitations

Our primary research question was to investigate how values at both individual and national-cultural levels influence consumers' deal proneness and their relationship with countries' demographic characteristics. Through our analyses using multilevel regression models and a random forest model, we uncovered several key insights.

We found that demographic factors, particularly age and gender, significantly affect deal proneness. Younger individuals tend to be more inclined towards deals, and women are generally more deal-prone than men. The employment status of homemakers also showed a positive relationship with deal proneness, increasing with age. Besides that, we found that deal proneness increases as the household size increases up to a size of 5. In examining individual values, we observed that values related to Self-Enhancement (such as Power, Achievement, and Hedonism) positively influenced deal proneness. In contrast, values under Openness to Change (like Self-direction and Stimulation) had a negative association with deal proneness.

Despite initial expectations, national-cultural values did not show significant results in our multilevel regression model. This finding suggests the possibility of more complex interactions between these values and other variables. To explore this, we introduced four distinct cross-cultural interaction terms into our analysis. Of these, two showed significant results. We found a notable interaction between age and intellectual autonomy, indicating that younger individuals in societies with a higher emphasis on autonomy are more inclined towards deals compared to the younger individuals in societies that prioritize embeddedness. Additionally, our analysis of the interaction between gender and hierarchy revealed a surprising trend: in more hierarchical societies, men showed an increased propensity for deal proneness compared to women in less hierarchical, or more egalitarian, settings.

The inclusion of cross-cultural interactions gained further emphasis in our study through the insights from the random forest model. This model allowed us to delve deeper into the interactions and variables influencing deal proneness. Among the key findings, a standout was the interaction between two national-cultural values: egalitarianism and mastery. We observed that deal proneness tends to be higher in environments where egalitarianism prevails over mastery. In contrast, settings characterized by a high emphasis on mastery and lower egalitarianism also exhibited increased deal proneness. Another significant discovery was the role of age. The random forest model highlighted age as a crucial factor interacting significantly with various variables, encompassing demographic factors, individual values, and national-cultural values. These results indicate that consumer behavior, particularly in the context of deal proneness, is significantly influenced by a blend of demographic factors and individual values.

*Managerial Implications.* The findings of this study have significant implications for marketers. Understanding that younger individuals and women are more inclined towards deals suggests that marketing campaigns can be tailored to appeal to these demographics more effectively. For instance, businesses can design promotions and advertising campaigns that resonate with the interests and values of these groups. Furthermore, the positive relationship between deal proneness and household size, particularly up to a size of five, indicates a valuable opportunity for targeting family-oriented

marketing strategies. Companies could offer bundle deals or family discounts to attract this segment of the market. The observed influence of individual values like Power, Achievement, and Hedonism on deal proneness also provides a basis for personalized marketing. Brands can craft messages that align with these values, appealing to consumers' desire for status, success, or pleasure through their deal offerings.

Besides that, the study's insights into the role of national-cultural values and cross-cultural interactions are crucial for companies operating in global markets. The lack of significant direct impact of national-cultural values in the multilevel regression model, along with the notable interactions between age, gender, egalitarianism, and mastery, suggest a nuanced approach is needed when entering diverse markets. Businesses should be aware of the cultural dynamics and values in different regions to tailor their strategies accordingly. For example, in societies with high intellectual autonomy, focusing on deals that appeal to younger consumers can be more effective, while in hierarchical societies, marketing strategies could be more male-oriented. Additionally, in settings where egalitarianism is high and mastery is low, businesses might find success in promoting deals that emphasize collective benefits or social equality. Conversely, in cultures where mastery is valued, highlighting the competitive advantage or exclusivity of deals could be more appealing.

*Limitations.* A primary limitation of our study is the underrepresentation of certain geographical regions, notably countries in Africa and Asia. These regions are often characterized by more hierarchical and embedded national-cultural values, which are crucial to our study's focus. The lack of representation from these parts of the world potentially skews our understanding of the impact of national-cultural values on consumer behavior. This limitation is significant as it may affect the generalizability of our findings to these regions. The cultural dynamics in Africa and Asia could offer different insights into how values influence deal proneness, and their underrepresentation means that our study may not fully capture the global variability in deal proneness. Therefore, the conclusions drawn may be more reflective of the regions predominantly represented in the dataset, potentially limiting the applicability of our findings to a global context.

Another limitation concerns our approach to measuring the dependent variable, deal proneness, which is based on responses to two subjective questions. Subjective responses can be influenced by individual perceptions, current circumstances, and interpretation of the questions, which may not accurately capture the true extent of a consumer's proneness to deals. Furthermore, relying on a limited number of questions constrains the depth of our understanding, as deal proneness is a complex behavior potentially influenced by a multitude of factors. A more robust measurement approach, perhaps incorporating a wider range of questions or different methodologies such as behavioral data analysis, could provide a more nuanced and accurate understanding of deal proneness.

*Future Research.* One of the most interesting avenues for future research is a more detailed investigation into the interactions between demographic variables, individual values, and national-cultural values. Our study has highlighted the significant role these interactions play in influencing consumer deal proneness. However, there is much more to uncover. Future studies should aim to delve deeper into how these variables interconnect in different cultural and demographic contexts. For instance, understanding how individual values like Power and Achievement interact with demographic factors such as age and gender in various cultural settings can provide a richer understanding of consumer behavior.

Another interesting area for future research is the examination of different types of coupons and consumer preferences towards them. Our study suggests that deal proneness varies among different demographic groups and cultural contexts, but it does not delve into the specifics of what types of deals or coupons are more appealing to these groups. Future research could categorize coupons and deals based on various characteristics, such as discount percentage, product type, and redemption method, to determine which are more attractive to different consumer segments. Investigating the preferences for digital versus physical coupons, time-limited offers versus ongoing discounts, or product-specific deals versus store-wide promotions in combination with the demographic, individual values, and national-cultural values variables, could provide valuable insights.

## 6 Appendix

### 6.1 Establishment and Reliability of Schwartz's Framework for Individual Values

The introduction of Schwartz's values in 1987 [37] signaled a notable change in understanding human values. Previous studies often used various methods, resulting in many factors or dimensions with improvised explanations [6]. Many of these dimensions lacked consistency across samples. Schwartz and Bilsky's work [37] addressed these shortcomings by offering a theoretical definition and a conceptual map of human values. Their approach enabled the creation of assumptions about different values and how they relate, and the results largely supported their ideas. This framework gave researchers a way to identify both universal and unique cultural values.

To give clarity to this conceptual outline, we will use the value mapping sentence illustrated in Figure 20. This presentation highlights three key facets of values: goal type, interests served, and motivational domain (Schwartz's values). It also outlines the common range for evaluating values. While Chapter 1 discussed ten individual values, Schwartz's original framework was smaller, featuring just seven. These motivational domains include enjoyment, achievement, self-direction, maturity, security, prosocial, and restrictive conformity. It's crucial to highlight that these definitions are centered around personal values as they emphasize "his/her own life." However, by adjusting this phrase, the scope can be broadened to represent the values of larger entities like groups or nations. If the mapping sentence correctly embodies our understanding of values, then a particular attitude can be represented by merging one element from each facet of the definition. For instance, the attitude of equality can be characterized by melding terminal, collectivist, and prosocial elements, while ambition is captured by integrating instrumental, individualistic, and achievement elements.

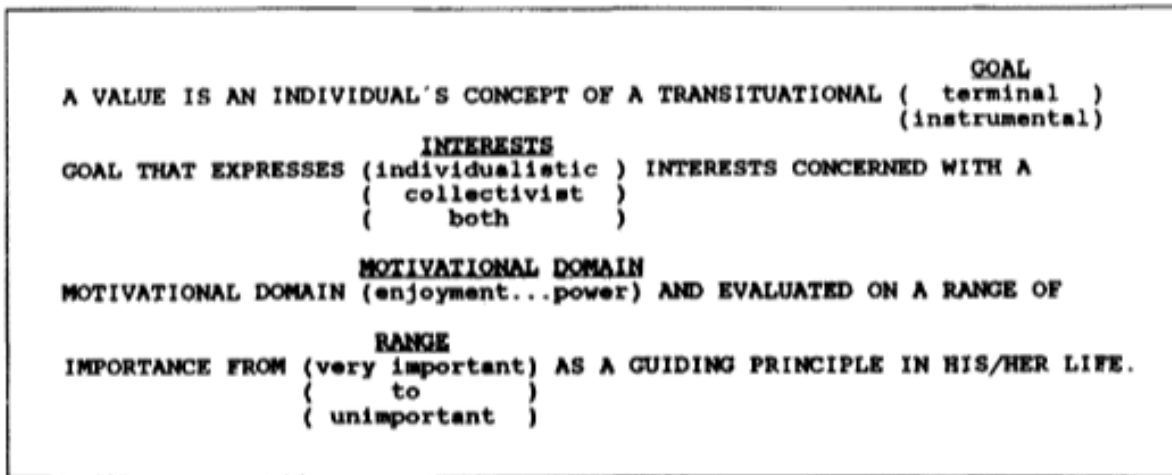


Figure 20: Mapping sentence to define values formally [37]

To validate the mapping of attitudes to Schwartz's values across diverse groups and therefore proving that this framework is a good tool to research human behavior, a 36-item value survey was conducted among Israeli teachers and German students [37]. Participants ranked 36 values based

on their significance as guiding principles in their lives. They were then instructed to compare each adjacent pair of values and specify how much more important the top-ranked value was compared to the one below, utilizing a 7-point scale (7 = much more important, 1 = almost the same importance). For every participant, value importance ratings were calculated. The lowest-ranked value was given a score of 1, and each subsequent higher-ranked value received a score that was the sum of the comparative scores of values ranked beneath it plus 1. The positions of the 36 values were then plotted using nonmetric multidimensional scaling analysis (SSA), as shown in Figure 21.

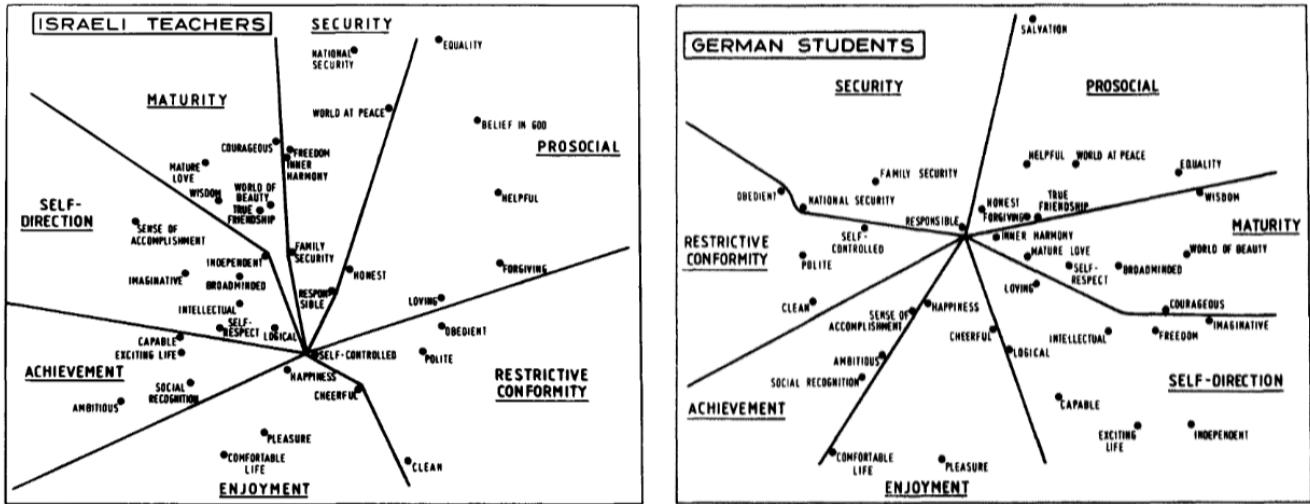


Figure 21: Projection of attitudes and motivational domains [37]

In Figure 21, we see distinct partition lines for both groups, separating the space into the seven different Schwartz values. These divisions are made using a predefined list of attitudes associated with each specific Schwartz value. It's essential to understand that the interpretation of SSA here is different from other multidimensional scaling methods. In SSA, the dimensions themselves are arbitrary without inherent meaning; instead, the regions they form are meaningful. Thus, from the mappings, our primary takeaway is that the attitudes have been successfully situated within the expected value region. This matching is evident for 96% of the attitudes on the Israeli map and 86% on the German map.

In a subsequent study, Schwartz [39] refined his initial framework of values. He introduced four modifications to the earlier structure:

1. Expanding underexplored values: the authors wanted to detail three values (tradition, stimulation, and power) that were only briefly mentioned before.
2. Refinement of existing values: four older value types (enjoyment, maturity, prosocial, security) were redefined for clarity based on new insights and research.
3. Relabeling values: three older values were renamed to better represent their updated meanings.
4. clarity and specificity: The authors now specify which values they're using to measure each value type, offering clearer insight into their research methodology.

The 10 values from the refined framework, as listed in Table 1, can be categorized based on the interests they focus on. Values such as power, achievement, hedonism, stimulation, and self-direction mainly target individual interests, while benevolence, tradition, and conformity target collective interests. Universalism and security, in their current definitions, address both individual and collective interests, making them likely candidates to sit at the intersection of these two domains. This classification is visually represented in Figure 22.

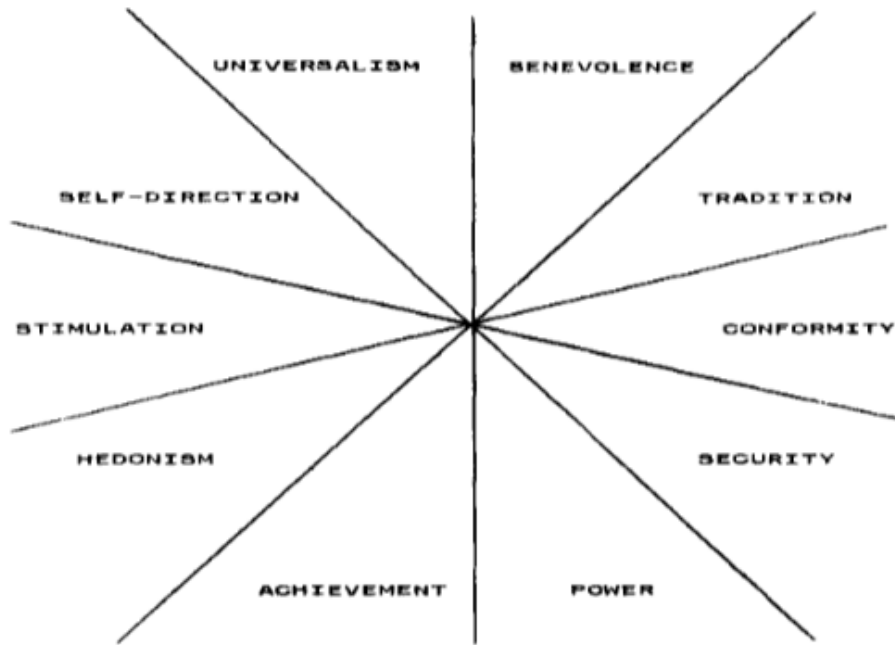


Figure 22: Structure of relations among types of values [39]

The same methodology as in the previous study of Schwartz and Bilsky [37] was used to validate this new framework, this time encompassing various groups from 20 countries. Respondents were questioned about the importance of particular attitudes, each belonging to a specific Schwartz value. When compiling results, all countries were treated equally. For nations with multiple samples, the value correlations from each were averaged, resulting in a single correlation matrix per country. These 20 matrices were then averaged to form a unified correlation matrix.

The two-dimensional projection of the SSA based on this unified matrix is displayed in Figure 23. Clear, separate zones appeared for each of the 10 value types. The overall value layout diverged from the structure in Figure 22 only in the way tradition and conformity values intersected, creating a combined, wedge-shaped area originating from a shared point. Besides using different countries, also a distinction was made between students and teachers, which concluded in the same result. These findings strongly support the validity of this framework.

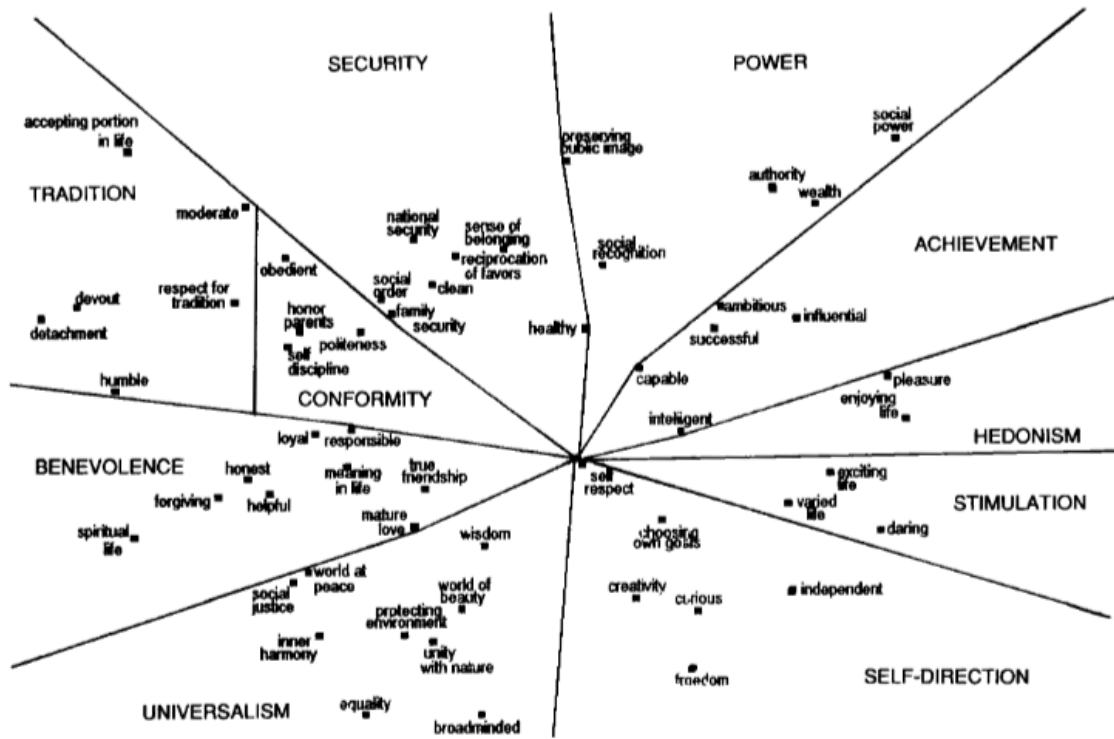


Figure 23: Individual level value structure averaged across 20 countries. [39]

## 6.2 Establishment and Reliability of Schwartz’s Framework for National-Cultural Values

Much like the validation of the ten individual values, these national cultural values were also validated using a similar method. Data was gathered from 80 teacher groups across 58 nationalities and 115 student groups from 64 nationalities, covering 67 nations and 70 cultural segments. In nations with diverse ethnic backgrounds, samples typically represented the dominant group. For each group, average scores of the 45 value items were determined. Instead of individual data points, these group averages became the focus of analysis. By correlating these averages across different groups, the study could draw conclusions at the national cultural level, rather than the individual [33]. Correlations between the sample means across samples were used in a multidimensional scaling analysis, which is visualized in Figure 24. The SSA diagram displayed a clear pattern: items chosen beforehand to symbolize each orientation gathered closely together, aligning perfectly with the theoretical expectations. The layout of these orientations also matched the theorized structure, emphasizing the validity of the six (or seven) cultural values and their interrelations.

The study from Schwartz [33] also investigated why it is valid to nations as the primary units for cultural analysis, even though nations aren’t always culturally uniform. the study compared cultural scores across various subgroups within nations. Results indicated consistent cultural values when comparing age and gender groups but showed differences when contrasting teachers with students. Additionally, when measuring cultural distances, differences between groups from separate nations were usually more significant than those within the same nation. These findings suggest that, with



appropriate sampling, nations are valid and meaningful units for comparing cultural values.

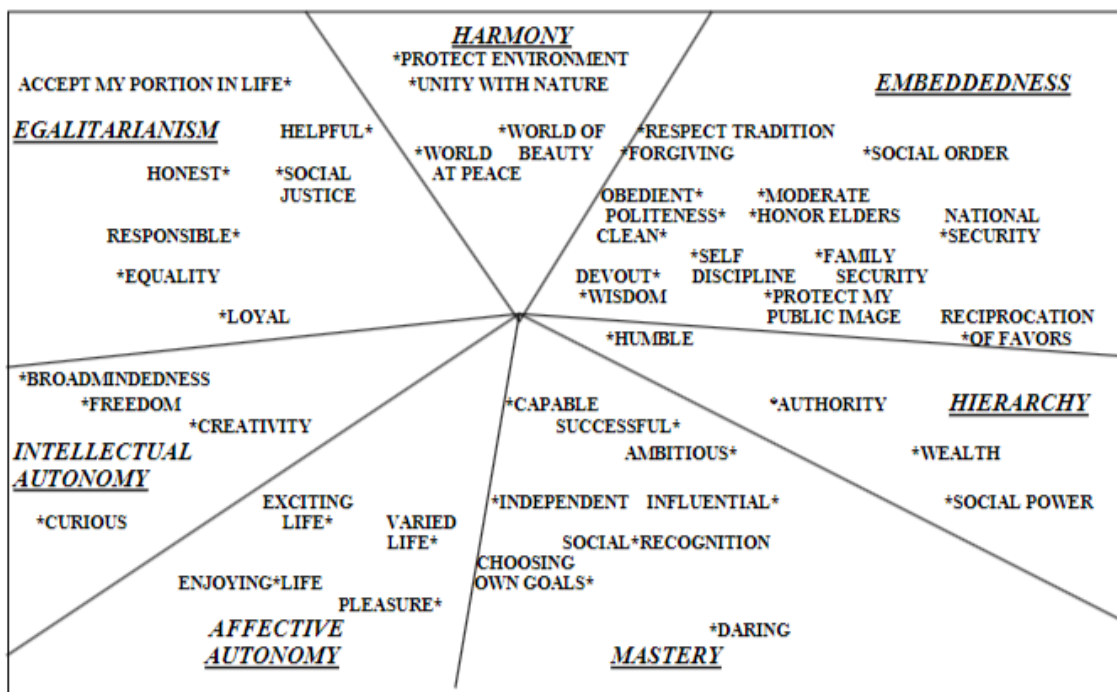


Figure 24: National cultural level value structure. [33]

In order to being able to connect the found national cultural values with the corresponding countries, we can use Figure 25. The study used the same data from teacher and student samples to derive scores on seven cultural value orientations for 67 national groups. To compare cultures across nations, the relative importance of each cultural orientation within a nation was standardized. Using the 'co-plot' multidimensional scaling technique, a spatial representation of the similarities and differences among nations was created, illustrating the cultural distances between them. This co-plot, while summarizing multiple cultural orientations in two dimensions, effectively highlighted how national cultures resembled or differed from one another. For instance, while Sweden emphasized harmony, intellectual autonomy, and egalitarianism, Zimbabwe prioritized mastery, embeddedness, and hierarchy.

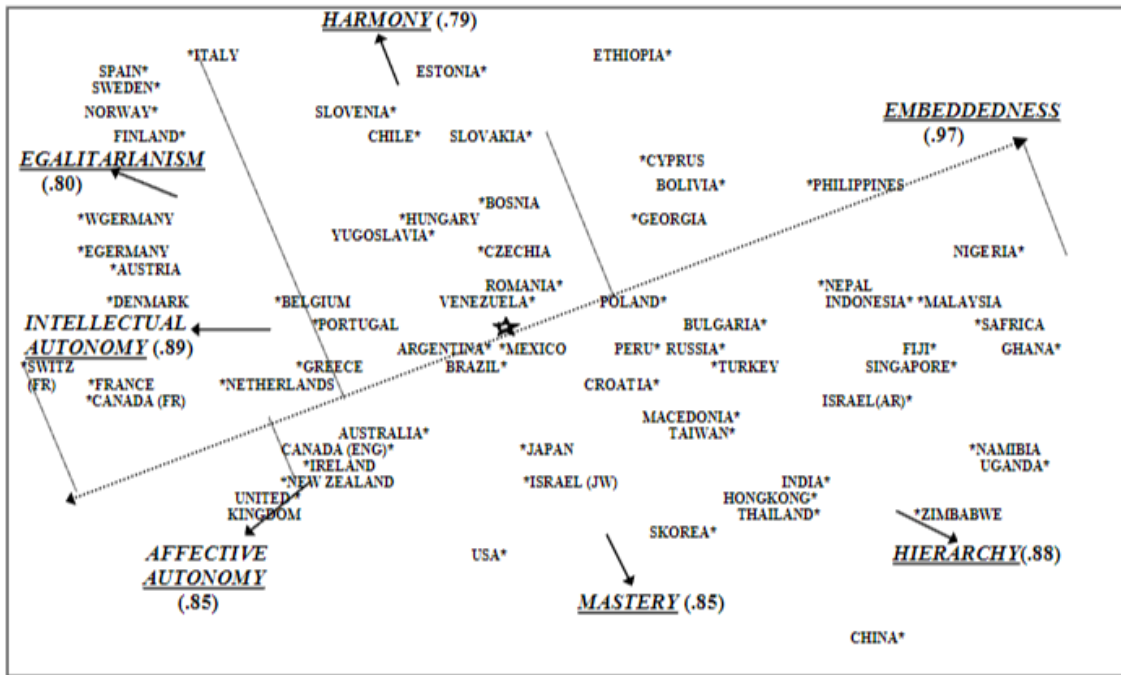


Figure 25: Co-plot map of 67 national groups on the seven national cultural values. [33]

### 6.3 Values and Corresponding Attitudes Within the Dataset

#### Power

- q140 SOCIAL POWER (control over others, dominance)
- q157 AUTHORITY (the right to lead or command)
- q146 WEALTH (material possessions, money)
- q160 PRESERVING MY PUBLIC IMAGE (protecting my face)

#### Achievement

- q181 SUCCESSFUL (achieving goals)
- q171 CAPABLE (competent, effective, efficient)
- q163 AMBITIOUS (hard-working, aspiring)
- q168 INFLUENTIAL (having an impact on people and events)

#### Hedonism

- q141 PLEASURE (gratification of desires)
- q176 ENJOYING LIFE (enjoying food, sex, leisure, etc.)

#### Stimulation

- q144 AN EXCITING LIFE (stimulating experiences)
- q166 DARING (seeking adventure, risk)
- q155 A VARIED LIFE (filled with challenge, novelty and change)

#### Selfdirection

q149 CREATIVITY (uniqueness, imagination)  
q142 FREEDOM (freedom of action and thought)  
q160b INDEPENDENT  
q179 CURIOUS (interested in everything, exploring)  
q170 CHOOSING OWN GOALS (selecting own purposes)

#### Universalism

q164 BROADMINDED (tolerant of different ideas and beliefs)  
q156 WISDOM (a mature understanding of life)  
q159 SOCIAL JUSTICE (correcting injustice, care for the weak)  
q139 EQUALITY (equal opportunity for all)  
q150 A WORLD AT PEACE (free of war and conflict)  
q158 A WORLD OF BEAUTY (beauty of nature and the arts)  
q154 UNITY WITH NATURE (fitting into nature)  
q167 PROTECTING THE ENVIRONMENT (preserving nature)

#### Benevolence

q175 HELPFUL (working for the welfare of others)  
q173 HONEST (genuine, sincere)  
q180 FORGIVING (willing to pardon others)  
q162 LOYAL (faithful to my friends, group)  
q178 RESPONSIBLE (dependable, reliable)

#### Tradition

q165 HUMBLE (modest, self-effacing)  
q172 ACCEPTING MY PORTION IN LIFE (submitting to life's circumstances)  
q177 DEVOUT (holding to religious faith and belief)  
q151 RESPECT FOR TRADITION (preservation of time-honoured customs)  
q161 MODERATE (avoiding extremes of feeling and action)

#### Conformity

q145 POLITENESS (courtesy, good manners)  
q174 OBEDIENT (dutiful, meeting obligations)  
q152 SELF-DISCIPLINE (self-restraint, resistance to temptation)  
q169 HONOURING OF PARENTS AND ELDERS (showing respect)

#### Security

q153 FAMILY SECURITY (safety for loved ones)  
q147 NATIONAL SECURITY (protection of my nation from enemies)  
q143 SOCIAL ORDER (stability of society)  
q182 CLEAN (neat, tidy)  
q148 RECIPROCATION OF FAVOURS (avoidance of indebtedness)

## 6.4 Dataset Characteristics

- *Dependent Variable*

	DealProne
Min.	1.00
Median.	3.50
Mean	3.42
Max.	5.00

- *Numeric Demographic Variables*

	Age	HouseholdSize	Children	IncomeClass	EducationLevel
Min.	11.00	1.00	0.00	1.00	1.00
Median.	37.00	3.00	0.00	4.00	6.00
Mean	39.29	3.22	0.71	3.61	5.44
Max.	91.00	12.00	9.00	6.00	7.00

- *Factored Demographic Variables*

Country					
argentina	austria	belgium	brazil	china	czech rep
408	400	539	392	426	491
denmark	france	germany	hungary	ireland	italy
531	434	623	555	584	375
japan	netherlands	norway	poland	portugal	romania
454	444	503	404	418	452
russia	slovakia	spain	sweden	swiss	taiwan
370	408	568	405	407	369
thailand	UK	ukraine	USA		
396	383	387	1195		

Gender		EmploymentStatus		
Female	Male	Full-time job	Homemaker	Part-time (8-29 hours) job
6111	7210	7095	660	922
		Part-time (under 8 hours) job	Retired	Sick/Disabled
		262	1574	240
		Student	Unemployed	
		1894	674	

- *Individual Values*

	Power	Achievement	Hedonism	Stimulation	Selfdirection
Min.	1.00	1.00	1.00	1.00	1.00
Median.	4.75	6.25	7.00	6.00	7.00
Mean	4.79	6.24	6.63	5.82	6.90
Max.	9.00	9.00	9.00	9.00	9.00

	Universalism	Benevolence	Tradition	Conformity	Security
Min.	1.00	1.00	1.00	1.00	1.00
Median.	7.00	7.20	5.60	6.75	7.00
Mean	6.89	7.05	5.57	6.71	6.96
Max.	9.00	9.00	9.00	9.00	9.00

- *National-Cultural Values*

	harmony	embeddedness	hierarchy	mastery	a.autonomy	i.autonomy	egalitarianism
Min.	3.46	3.10	1.49	3.72	2.99	4.02	4.23
Median.	4.16	3.49	2.09	3.92	3.73	4.61	4.89
Mean	4.11	3.49	2.18	3.94	3.78	4.58	4.78
Max.	4.62	4.02	3.49	4.41	4.39	5.13	5.27

## References

- [1] Deal prone. <https://www.monash.edu/business/marketing/marketing-dictionary/d/deal-prone#:~:text=a%20term%20used%20to%20describe,actively%20seek%20out%20%20special%20offers>. Accessed: 02-07-2023.
- [2] What is a random forest?
- [3] Icek Ajzen. Nature and operation of attitudes. *Annual review of psychology*, 52:27–58, 02 2001.
- [4] Emin Babakus, Peter K. Tat, and William A. Cunningham. Coupon redemption: A motivational perspective. *Journal of Consumer Marketing*, 5:37–43, 1988.
- [5] Robert Blattberg, Thomas Buesing, Peter Peacock, and Subrata Sen. Identifying the deal prone segment. *Journal of Marketing Research*, 15(3):369–377, 1978.
- [6] Valerie Braithwaite and H. Law. Structure of human values. testing the adequacy of the roeach value survey. *Journal of Personality and Social Psychology*, 49:250–263, 07 1985.
- [7] Leo Breiman. Random forests. *Machine learning*, 45:5–32, 2001.
- [8] Steven M. Burgess and Jan-Benedict E. M. Steenkamp. *Value Priorities and Consumer Behavior in a Transitional Economy*, pages 85–105. Springer US, Boston, MA, 1999.
- [9] Patrali Chatterjee and John McGinnis. Customized online promotions: Moderating effect of promotion type on deal value, perceived fairness, and purchase intent. *Journal of Applied Business Research*, 26, 07 2010.
- [10] Madhurjya Chowdhury. What is multilevel modelling? why use multilevel modelling? <https://www.analyticsinsight.net/what-is-multilevel-modelling-why-use-a-multilevel-model/>, 2022. Accessed: 20-05-2023.
- [11] Xavier Drèze and David R Bell. Creating win–win trade promotions: Theory and empirical analysis of scan-back trade deals. *Marketing science*, 22(1):16–39, 2003.
- [12] Jr. Frederick E. Webster. The “deal-prone” consumer. *Journal of Marketing Research*, 2(2):186–189, 1965.
- [13] A. G. and S. Singh. Impact of sales promotion tools on consumer purchase decision towards white goods in india. *Research Journal of Management Sciences*, 2(7):10–14, 2013.
- [14] Katja Gelbrich, Stefan W. Müller, and Stanford A. Westjohn. *Cross-Cultural Consumer Behavior*. Edward Elgar Publishing, 2023.
- [15] Justin Hayward. How american airlines’ aadvantage program became the world’s first frequent flyer scheme, Jun 2023.

- [16] Nadine Hennigs, Klaus-Peter Wiedmann, Christiane Klarmann, Suzane Strehlau, Bruno Godey, Daniele Pederzoli, Agnes Neulinger, Kartik Dave, Gaetano Aiello, Raffaele Donvito, Koyama Taro, Janka Táborecká-Petrovičová, Carmen Rodríguez Santos, Jaehee Jung, and Hyunjoo Oh. What is the value of luxury? a cross-cultural consumer perspective. *Psychology & Marketing*, 29(12):1018–1034, 2012.
- [17] Geert Hofstede and Michael H Bond. Hofstede’s culture dimensions: An independent validation using rokeach’s value survey. *Journal of cross-cultural psychology*, 15(4):417–433, 1984.
- [18] Joop J Hox, Mirjam Moerbeek, and Rens Van de Schoot. *Multilevel analysis: Techniques and applications*. Routledge, 2017.
- [19] Jacqueline J. Kacen and Julie Anne Lee. The influence of culture on consumer impulsive buying behavior. *Journal of Consumer Psychology*, 12(2):163–176, 2002.
- [20] Fatma Kahraman and Sevim Cesur. The mediating role of materialism on the relationship between values and consumption. *Educational Sciences: Theory Practice*, 14, 01 2015.
- [21] Michel Laroche, Frank Pons, Nadia Zgolli, Marie-Cécile Cervellon, and Chankon Kim. A model of consumer response to two retail sales promotion techniques. *Journal of Business Research*, 56(7):513–522, 2003. Retailing Research.
- [22] J. WILLIAM LEVEDAHL. Coupon redeemers: Are they better shoppers? *Journal of Consumer Affairs*, 22(2):264–283, 1988.
- [23] Michael Lewis. The influence of loyalty programs and short-term promotions on customer retention. *Journal of Marketing Research*, 41(3):281–292, 2004.
- [24] Yuping Liu and Rong Yang. Competing loyalty programs: Impact of market saturation, market share, and category expandability. *Journal of Marketing*, 73(1):93–108, 2009.
- [25] Neil A Morgan, Kimberly A Whitler, Hui Feng, and Simos Chari. Research in marketing strategy. *Journal of the Academy of Marketing Science*, 47:4–29, 2019.
- [26] Aron O’Cass and Hmily Frost. Status brands: Examining the effects of non-product-related brand associations on status and conspicuous consumption. *Journal of Product Brand Management*, 11, 04 2002.
- [27] Miriam Pepper, Tim Jackson, and David Uzzell. An examination of the values that motivate socially conscious and frugal consumer behaviours. *International Journal of Consumer Studies*, 33(2):126–136, 2009.
- [28] Milton Rokeach. *The Nature of Human Values*. New York,: Free Press, 1973.
- [29] Cynthia Rudin and Joanna Radin. Why Are We Using Black Box Models in AI When We Don’t Need To? A Lesson From an Explainable AI Competition. *Harvard Data Science Review*, 1(2), nov 22 2019. <https://hdsr.mitpress.mit.edu/pub/f9kuryi8>.



- [30] Mahmoud Abdel Hamid Saleh, Bothayna Alothman, and Layla Alhoshan. Impact of gender, age and income on consumers' purchasing responsiveness to free-product samples. *Research Journal of International Studies*, 83, 2013.
- [31] Shalom Schwartz. *Universals in the Content and Structure of Values: Theoretical Advances and Empirical Tests in 20 Countries*, volume 25, pages 1–65. 12 1992.
- [32] Shalom Schwartz. *Beyond Individualism/Collectivism: New Cultural Dimensions of Values*, volume 18, pages 85–119. 01 1994.
- [33] Shalom Schwartz. *Mapping and interpreting cultural differences around the world*, pages 43–73. 01 2004.
- [34] Shalom Schwartz. Basic human values: Theory, measurement, and applications. *Revue Francaise de Sociologie*, 47:929–968+977+981, 10 2006.
- [35] Shalom Schwartz. The 7 schwartz cultural value orientation scores for 80 countries, 01 2008.
- [36] Shalom Schwartz. An overview of the schwartz theory of basic values. *Online Readings in Psychology and Culture*, 2, 12 2012.
- [37] Shalom Schwartz and Wolfgang Bilsky. Toward a universal psychological structure of human values. *Journal of Personality and Social Psychology*, 53:550–562, 09 1987.
- [38] Shalom Schwartz, Gila Melech, Arielle Lehmann, Steve Burgess, Mari Harris, and Vicki Owens. Extending the cross-cultural validity of the theory of basic human values with a different method of measurement. *Journal of Cross-cultural Psychology - J CROSS-CULT PSYCHOL*, 32:519–542, 09 2001.
- [39] Shalom H. Schwartz. Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. volume 25 of *Advances in Experimental Social Psychology*, pages 1–65. Academic Press, 1992.
- [40] D. Sharma and S. Singh. Deal proneness and national culture: evidence from the usa, thailand and kenya. *International Marketing Review*, 35:981–1008, 2018.
- [41] Marianna Sigala. A framework for designing and implementing effective online coupons in tourism and hospitality. *Journal of Vacation Marketing*, 19(2):165–180, 2013.
- [42] Himanshi Singh. GSplitting Decision Trees with Gini Impurity — analyticsvidhya.com. <https://www.analyticsvidhya.com/blog/2021/03/how-to-select-best-split-in-decision-trees-gini-impurity/>. [Accessed 21-11-2023].
- [43] Steenkamp and De Jong, 2010.
- [44] Hawkins Stern. The significance of impulse buying today. *Journal of Marketing*, 26(2):59–62, 1962.

- [45] Trang Tran, Sandipan Sen, and Eric Van Steenburg. This ad's for you: how personalized sns advertisements affect the consumer-brand relationship. *Journal of Consumer Marketing*, 03 2023.
- [46] Glenn B Voss and Kathleen Seiders. Exploring the effect of retail sector and firm characteristics on retail price promotion strategy. *Journal of Retailing*, 79(1):37–52, 2003.
- [47] B. Wierenga and J.M. Soethoudt. Sales promotion and channel coordination. *Journal of the Academy of Marketing Science*, 38(3):383–397, 2010.