

Advancing personality-inclusive urbanism: Does personality heterogeneity shape preferences for leftover space regeneration?

Abstract

Urban leftover spaces — residual plots, edge zones, and underused fragments of the built environment — are increasingly targeted for inclusive urban regeneration centered on citizen-oriented activities in high-density cities, yet planning practice still relies almost exclusively on socioeconomic profiles to anticipate residents' preferences. This study advances a personality-inclusive perspective on urban regeneration by investigating whether and how the Big Five personality traits shape residents' preferences for leftover space regeneration. Drawing on a survey of 2,000 residents across 13 districts of Hangzhou, China, we estimate a two-stage discrete-choice model: a binary logit for the decision to support regeneration versus maintain the status quo, and a multinomial logit for the preferred direction (public activity space, landscape enhancement, or commercial use) among supporters. The main-effect results reveal that personality matters, but selectively: agreeableness is the sole significant predictor of general support ($\beta = 0.380$, $p < 0.05$; OR = 1.46), while extraversion uniquely predicts preference for active-use directions over passive landscape enhancement ($\beta \approx 0.24 - 0.25$, $p < 0.01$). Interaction analyses further demonstrate that personality traits non-significant in the aggregate — conscientiousness, openness, and neuroticism — become significant predictors when interacted with specific socioeconomic conditions: conscientiousness predicts support among middle-aged respondents ($p=0.030$); openness predicts active-use preference among the elderly ($p < 0.04$) and high-income groups ($p=0.009$); and neuroticism predicts support among males ($p=0.028$). Subgroup analyses confirm that agreeableness effects concentrate among non-native residents and professional/self-employed groups. All main effects are robust to alternative personality measurement (BFI-10) and alternative estimators (probit). By demonstrating that stable personality dispositions constitute an identifiable, socially situated source of preference heterogeneity in urban renewal, the study provides empirical grounds for incorporating personality heterogeneity into inclusive regeneration planning.

Keywords: leftover space regeneration; Big Five personality; inclusive; Hangzhou

1 Introduction

Over the past few decades, large-scale urbanisation has left behind a significant stock of leftover space in cities worldwide. These residual areas are typically located behind buildings (Akkerman & Cornfeld, 2010), beneath elevated bridges (Qamaruz-Zaman et al., 2012), at street intersections, or in abandoned riverside zones, varying widely in size and shape. Due to ambiguous ownership, insufficient maintenance, and limited investment, these spaces remain underutilised "urban voids" (Trancik, 1986; Loukaitou-Sideris, 1996). Unmanaged, they trigger the "broken windows effect" (Carmona, 2010), leading to illegal dumping, public health risks, and community decline. In high-density Chinese cities, rapid growth has produced interstitial fragments that collectively degrade the everyday environment of millions of residents (He & Wu, 2020; Zheng et al., 2022).

"Make cities and human settlements inclusive, safe, resilient, and sustainable" (SDG 11) calls for planning that accommodates the full diversity of residents' needs (Fainstein, 2010; Fincher & Iveson, 2008). Leftover-space regeneration is a key arena for operationalising this inclusivity at the micro scale: these spaces are neighbourhood-embedded, directly experienced, and involve choices among qualitatively different use directions. Ensuring regeneration reflects genuine preference heterogeneity — rather than the loudest voices — is both a spatial-justice requirement and a condition for sustainable outcomes. Yet the "diversity" that planners measure remains largely demographic (Chen et al., 2023; Zhang et al., 2024). Whether residents with identical demographic profiles hold different spatial preferences — and what drives that difference — is a question current frameworks cannot answer.

Personality psychology offers a mature but untapped resource for deepening inclusive planning. The Big Five model captures stable dispositions validated across cultures and life

stages (McCrae & Costa, 2008), predicting civic participation (Mondak, 2010), pro-environmental behaviour (Soutter et al., 2020), and residential preferences (Jokela et al., 2015). Integrating personality into urban renewal establishes a correspondence between spatial attributes and psychological structures, enabling a shift from "universal supply" to "inclusive response." A planning process blind to personality heterogeneity risks systematic misrepresentation of community preferences—precisely the exclusion inclusive urbanism seeks to prevent.

Despite this theoretical promise, two critical gaps persist. First, personality has seldom been empirically examined in the context of urban regeneration—particularly the concrete question of what residents prefer for leftover spaces in their own neighbourhoods. Existing socio-psychological research on urban renewal tends to focus on participation motivation and intention rather than preferences for specific renewal content (He & Wu, 2020; Wu, 2022). Yet during the regeneration process, clarifying the direction of spatial transformation is crucial for optimising spatial governance and ensuring orderly implementation. Second, even where personality – environment links have been documented in adjacent fields, the conditions under which personality effects emerge have received insufficient attention (Mischel & Shoda, 1995; Tett & Burnett, 2003). A trait that appears irrelevant in the aggregate may prove consequential for specific demographic segments. Without identifying these conditional effects, planners cannot know where in the population personality-driven preference divergence is strongest—and therefore cannot target engagement strategies effectively.

This study addresses both gaps: (1) Do Big Five traits shape support for and direction of leftover-space regeneration? (2) Are personality effects amplified in specific socioeconomic contexts? We employ a two-stage discrete-choice model with systematic personality × socioeconomic interaction tests, using 2,000 respondents across Hangzhou's 13 districts.

The paper makes three contributions to the emerging agenda of personality-inclusive urbanism. (1) We demonstrate that personality carries independent explanatory power for regeneration preferences beyond socioeconomic controls. (2) We show that personality effects are socially situated—emerging in identifiable subpopulations where targeting is feasible. (3) We provide a replicable methodological template for integrating personality into participatory planning research.

The remainder of the paper is organised as follows. Section 2 reviews the relevant literatures. Section 3 develops the conceptual framework and hypotheses. Section 4 details the data, measures, and estimation strategy. Section 5 presents results. Section 6 discusses implications, limitations, and directions for future research.

2 Conceptual background

2.1 Leftover space regeneration

The concept of "leftover space" traces to Trancik's (1986) "lost space"—fragmented urban areas left behind by rigid planning implementation (Covatta & Ikalović, 2022; Eissa et al., 2019). These spaces, typically located behind buildings (Akkerman & Cornfeld, 2010), beneath bridges (Qamaruz-Zaman et al., 2012), at intersections, or along abandoned riverfronts, share four defining features: (1) physical constraints—fragmentation, irregular morphology, poor accessibility, and disconnection from adjacent environments; (2) functional vacancy — "unprogrammed" status outside planning regulations (Loukaitou-Sideris, 1996); (3) temporal dynamics—cyclical patterns of abandonment, appropriation, and redesign; and (4) reuse potential—capacity for informal adaptation as "spaces of possibility" (Mahmoudi Farahani & Maller, 2019; Xu & Ehlers, 2022; Qiao et al., 2025).

Terms	Definition	Source
Lost Space	Negative areas between designated regions, characterized by unclear boundaries and a lack of connection to the nearby built-up environment, yet they hold significant potential for reuse	Roger Trancik, 1986
Terrain vague	Unproductive land and idle built forms: abandoned industrial/transport sites, vacant lots, dilapidated buildings, defunct public spaces.	Ignasi de Sola-Morales (1995)

Space of uncertainty	Urban zones that have lost their original functions and not yet been assigned new ones.	Cupers and Miessen, 2002
Superfluous landscape	The "backside" of the designed, "primary" spaces of public life	Nielsen (2002)
Urban void	Urban voids that are considered unutilized, unnoticed or meaningless by a large segment of community	Eli First & Tamar Pertzov (2004)
Site out of sight	The first: once-usable but neglected places (e.g., forgotten parks); the second: never-visible enclosed off-limits spaces.	Crisman, 2005
Indeterminate space	Spaces out of sync with their urban surroundings, caused by deindustrialisation and urban shrinkage.	Gorth & Corjin, 2005
Loose Space	Without official uses, such spaces evade formal public space flow, rules and monitoring.	Karen A. Frank & Quentin Stevens (2006)
Urban interstice	A temporary functionless space	Tonnelat, 2008
Residual space	Spaces that have been extensively appropriated yet possess redevelopment potential	Marwa Hassan Khalil, 2013
SLOAP	Space Left Over After Planning	The Oxford Dictionary of Architecture, 2015
In-between space	Undefined urban physical fragments lying in surplus.	Brighenti, 2016
Neighborhood space	Unbuilt open or semi-open areas with no specific functions, serving as leftover fragments of residential built environments.	Gulati, 2020

Despite these deficits, leftover spaces hold significant regeneration potential. Jacobs (1961) emphasised the importance of small-scale diversity for vibrant urban life; Lynch (1995) argued that well-distributed small spaces may be more useful than large planned tracts; Bishop and Williams (2012) showed that minor modifications to the "nooks and crannies" of the urban fabric can cumulatively improve quality of life. The literature identifies four regeneration modes: (1) landscape revitalisation (wildlife habitat, urban farming); (2) green infrastructure transformation (contaminated-land remediation, adaptive reuse of industrial heritage); (3) public space planning (green open space, community gardens); and (4) placemaking (urban acupuncture, DIY urbanism, space (re)territorialisation). Global practice is rich: reading spaces under flyovers (Ferretto, 2018), interactive fitness facilities (Gao et al., 2022), government-designated riverside parks in Rome (Franck & Stevens, 2007), graffiti-integrated art corridors in Melbourne (Moreau, 2022), and resident-placed domestic items in Tokyo and London alleys reflecting strong social capital (Ikalovic & Radovic, 2018; Forde et al., 2023). Across these initiatives, a common thread is that successful regeneration requires functional zoning aligned with local spatial morphology and resident needs—creating identifiable places rather than homogeneous outputs of conventional planning.

The concept of "leftover space" dates back to "Lost Space," proposed by urban designer Roger Trancik in 1986 (Covatta and Ikalović, 2022; Eissa et al., 2019; Kamvasinou, 2011). The Oxford Dictionary of Architecture defines "leftover space" as "Space Left Over After Planning," referring to fragmented urban spaces of varying forms left behind following the implementation of rigid urban planning. These leftover spaces exhibit layered value deficits across spatial, economic, and social dimensions, perpetuating cycles of underdevelopment and marginalization within the urban system. Synthesizing existing literature, leftover spaces possess the following typical characteristics: (1) Physical environmental constraints, such as fragmentation, irregular morphology, poor accessibility, pollution, or design flaws, resulting in a lack of connectivity with the adjacent built environment; (2) Functional "unprogrammed" status, where land use is uncertain, existing in a "functional vacuum" outside the scope of urban planning regulations and oversight systems; (3) Temporal dynamics, as spatial usage is often sporadic or periodic, evolving through continuous informal use—a single space may undergo multiple cycles between abandonment, appropriation, and formal redesign; (4) Potential for reuse, functioning as "spaces of possibility" characterized by a capacity for informal adaptation

or grassroots appropriation (Mahmoudi Farahani & Maller, 2019; Xu & Ehlers, 2022; Qiao et al., 2025; Alanyali, 2009).

2.2 Urban regeneration under the trend of inclusivity

UN-Habitat (2001) defined the "Inclusive City" as a place where everyone can fully participate in social, economic, and political opportunities. The World Bank further specified spatial, social, and economic dimensions of inclusive development, subsequently enriched by scholars with environmental and political dimensions (Liang, 2021). Inclusive urban regeneration aims to open exclusionary structures and ensure all individuals have equal possibilities to develop capacities and participate in socioeconomic activities (Rodela & Hast, 2024; Vandecasteele et al., 2019).

Leftover spaces are uniquely positioned within this agenda. Lacking pre-defined uses, they are among the only urban venues accommodating "informal activities" and "spontaneous practices," transforming rigid top-down procedures into flexible, socially inclusive instruments. Yet critical scholarship warns that small-scale projects can accelerate neoliberal policies (Peck, 2012), trigger gentrification (Colomb, 2012; Spataro, 2016), or displace the populations who initiated regeneration (Vallance et al., 2017). Achieving genuinely inclusive outcomes requires responsive, participatory mechanisms capable of representing the fragmented and often conflicting interests within communities.

This raises a fundamental question: on what basis should planners understand the heterogeneity of community preferences? Current approaches rely almost exclusively on socioeconomic segmentation—age, income, education, housing tenure. We argue that stable psychological dispositions constitute an additional, systematic dimension of preference heterogeneity that inclusive regeneration must address.

2.3 Personality theory

The Big Five model (Five-Factor Model) is the most widely accepted personality framework across research domains (McCrae & John, 1992; Goldberg, 1990; Costa & McCrae, 1992). It categorises personality into five stable dimensions: Neuroticism (emotional instability, anxiety), Agreeableness (cooperativeness, trust), Conscientiousness (order, dutifulness), Openness to Experience (curiosity, aesthetic sensitivity), and Extraversion (sociability, assertiveness). The model exhibits high generalisability and cross-cultural universality across 50 cultures (McCrae & Terracciano, 2005) and temporal stability among working-age adults (Cobb-Clark & Schurer, 2012).

Evidence from adjacent fields confirms the relevance of personality to spatial and civic behaviour: agreeableness, openness, and conscientiousness predict pro-environmental behaviour (Soutter et al., 2020; Hirsh, 2010); extraversion predicts civic participation (Mondak, 2010; Gerber et al., 2011); and personality predicts residential location preferences (Jokela et al., 2015). Person – environment transaction frameworks (Buss, 1987; Furr & Funder, 2018; Wrzus et al., 2016) further indicate that personality and place mutually shape one another. Despite this theoretical richness, personality has never been applied to leftover-space regeneration preferences—a gap this study addresses.

3 Research Hypotheses

Drawing on the conceptual framework above—which positions personality as a systematic but underexplored dimension of preference heterogeneity in leftover-space regeneration—we propose three hypotheses.

H1: Big Five personality traits significantly influence whether residents support leftover-space regeneration.

Regeneration of shared neighbourhood space is fundamentally a collective-action question: accepting change requires trust, tolerance for disruption, and concern for community welfare. The Big Five literature demonstrates that personality traits—particularly agreeableness and conscientiousness—predict cooperative behaviour, public-goods contributions, and civic endorsement of collective initiatives (Hilbig et al., 2014; Mondak, 2010; Roberts et al., 2009). If personality shapes how individuals evaluate collective action in other domains, it should also shape whether they endorse neighbourhood-level spatial change. We therefore hypothesise that, net of socioeconomic controls and spatial context, at least one Big Five trait significantly predicts the binary decision to support regeneration versus maintain the status quo.

H2: Big Five personality traits significantly influence residents' preferred direction of leftover-space regeneration.

Once the decision to support change is made, residents face a qualitatively different choice among regeneration directions—public activity space, landscape enhancement, or commercial use—that differ in social density, stimulation level, and functional character. Evidence from residential-preference and environmental-behaviour research shows that personality traits predict preferences for built-environment attributes: extraversion predicts preference for socially active, densely populated settings (Jokela et al., 2015; Rentfrow et al., 2015), while neuroticism is associated with preference for quiet, controllable environments (Nettle, 2006). Person – environment fit theory (Buss, 1987; Furr & Funder, 2018) further predicts that individuals gravitate toward environments congruent with their dispositional tendencies. We therefore hypothesise that, among supporters, at least one Big Five trait significantly differentiates among the three regeneration directions.

H3: The influence of personality traits on regeneration preferences is moderated by socioeconomic characteristics, such that personality × socioeconomic interactions produce significant effects on both support and directional preference.

Trait activation theory (Tett & Burnett, 2003) and the situational-strength framework (Mischel & Shoda, 1995) predict that personality effects are not uniform but depend on contextual conditions. Traits are most behaviourally consequential in "weak situations" where normative constraints are low and individual differences can manifest freely. Life-course research shows that the salience of specific traits varies by age stage (Roberts et al., 2006); resource theory indicates that economic security expands the discretionary latitude for personality-driven preferences (Inglehart, 1997); gender-role socialisation creates different channels for trait expression (Eagly & Wood, 2012); and social-integration theory suggests that newcomers lacking local networks are more reliant on dispositional cues (Berry, 1997; Putnam, 2007). We therefore hypothesise that interactions between Big Five traits and socioeconomic variables (age, income, gender, occupation, native status) significantly predict leftover-space regeneration preferences beyond the main effects of personality and demographics alone.

4 Methodology

4.1 Study area and data collection

4.1.1 Study area

Hangzhou is the capital city of Zhejiang Province in eastern China, with a permanent resident population exceeding 12 million. The city's GDP exceeded 2.3 trillion yuan in 2025. The city administers 10 urban districts (Shangcheng, Gongshu, Xihu, Binjiang, Xiaoshan, Yuhang, Linping, Qiantang, Fuyang, and Lin'an) and 3 county-level cities/counties (Tonglu, Jiande, and Chun'an). As one of China's most economically dynamic cities, Hangzhou has experienced rapid urbanisation and substantial built-environment transformation over the past two decades.

Hangzhou was selected as the study area for several reasons. First, the city's rapid development has generated a large number of urban leftover spaces—residual plots, edge zones, and underused fragments—characteristic of the urban regeneration challenge facing Chinese cities. Second, Hangzhou has been at the forefront of community governance innovation, actively promoting participatory approaches to neighbourhood improvement and small-scale urban interventions. The city government has explicitly encouraged micro-regeneration as a strategy for improving living environments in established neighbourhoods. Third, Hangzhou's population is socioeconomically diverse, encompassing both long-term local residents and a large migrant population, providing variation in demographic characteristics. Fourth, the city's 13 districts and counties span a range of urban contexts—from the dense historic core to newer suburban developments—enabling analysis of spatial heterogeneity.

4.1.2 Data collection

Data were collected through a structured online questionnaire administered between November and December 2025. A team of 73 trained field liaison personnel recruited respondents through online channels and community outreach. A total of 5,024 questionnaires were received. After removing 1,621 incomplete re-sponses and 617 that failed screening questions, 2,786 questionnaires entered the quality-control review process. Following comprehensive quality-control checks, 786 questionnaires

were judged unqualified, yielding a final sample of 2,000 valid responses (overall qualification rate: 39.8%).

Fig 2 Study area (包括样本分布情况)

4.2 Variables

4.2.1 Independent variables: Big Five personality traits

The Big Five personality traits were measured using the BFI-20 [Soto and John, 2017], with four items per trait rated on a 5-point Likert scale. Trait scores are computed as the mean of the four items (after reverse-coding where applicable) and then standardised to z-scores for regression analysis, so that all coefficients are interpretable as effects of a one-standard-deviation increase.

4.2.2 Dependent variables: Regeneration preference

Regeneration direction preference Respondents were asked: “If there is an under-used corner space in your neighbourhood, which of the following regeneration directions would you most prefer?” Response options were: (1) Convert to public activity space (e.g., sports facilities, community gathering areas); (2) Landscape beautification (e.g., greenery, flower beds, seating); (3) Commercial conversion (e.g., convenience stores, cafes); (4) Maintain the status quo. The distribution is: 42.5% public activity space, 27.6% landscape beautification, 25.6% commercial conversion, and 4.2% maintain status quo.

4.2.3 Control variables

Socioeconomic and demographic controls include: age (continuous), gender (binary: female =1), education (ordinal: middle school or below=1, high school=2, bache-lor’s=3, master’s or above=4), annual household income (ordinal: four categories), homeownership (binary: owner-occupied=1), marital status (binary: married=1), and self-rated health (5-point scale). District fixed effects (13 districts/counties) are included in fully specified models to control for spatial heterogeneity in regeneration contexts and governance quality.

4.3 Data analysis strategy

This study adopts a two-stage analytical framework. In the first stage, a binary choice model is specified to separate support for regeneration (Options 1 - 3) from maintaining the status quo (Option 4), with a full sample size of N=2000. In the second stage, a choice model for the three regeneration directions is estimated on the subsample of respondents who support regeneration (N=1915), using landscape enhancement as the reference group. This modeling approach conforms to the behavioral logic of preference formation in urban renewal: residents first evaluate whether regenerating urban leftover spaces is worthwhile, and only upon a positive judgment do they proceed to select a specific regeneration type. Merging these two logically sequential decisions into a single four-category multinomial regression would blur the boundaries between two distinct decision processes.

4.3.1 Binary logistic regression

4.3.2 Multinomial logistic regression

5 Results

5.1 Descriptive Statistics and Scale Reliability

Table 1: Descriptive Statistics for All Variables (N=2,000)

Variable	Description	Mean	SD	Min	Max
<i>Independent variables :Big Five personality traits</i>					
Conscientiousness		3.706	0.690	1	5
Extraversion		3.446	0.758	1	5
Openness		3.742	0.736	1	5
Agreeableness		3.929	0.699	1	5
Neuroticism		2.730	0.816	1	5

<i>Control variables</i>					
Age	2026 – birth year	32.346	9.589	21	71
Gender	1 = male, 0 = female	.414	.493	0	1
Education	1 = high school or below, 2 = bachelor, 3 = master+)	1.780	.235	0	1
Marriage	1 = married & cohabiting, 0 = otherwise	.378	.485	0	1
Income	1 = <200k, 2 = 200 - 500k, 3 = ≥500k CNY	1.374	.561	1	3
Health	1 = good/excellent, 0 = poor/fair	.505	.500	0	1
House property	1 = owner, 0 = non-owner	.520	.500	0	1

Figure 1. Distribution of Big Five Personality Traits (Z-scores)



5.2 Binary Logit: Support for Regeneration

Table 3: Results of BFI on Support for Leftover Space Regeneration

Variable	(1)	(2)	(3)
Openness	0.029 (0.148)	-0.028 (0.153)	-0.045 (0.154)
Conscientiousness	0.186 (0.156)	0.197 (0.159)	0.185 (0.161)
Extraversion	-0.029 (0.157)	-0.012 (0.162)	-0.017 (0.163)
Agreeableness	0.388** (0.159)	0.360** (0.165)	0.382** (0.167)
Neuroticism	0.049 (0.132)	-0.025 (0.137)	-0.030 (0.137)
Age		-0.014 (0.013)	-0.013 (0.014)
Education		0.344* (0.208)	0.366* (0.209)
Gender (male=1)		-0.681*** (0.230)	-0.666*** (0.233)
Income		-0.022 (0.231)	-0.033 (0.233)
House property (owner=1)		0.510** (0.255)	0.490* (0.264)

Marriage (married=1)		-0.303	-0.299
		(0.298)	(0.302)
Health		-0.046	-0.052
(good/excellent=1)		(0.242)	(0.245)
District FE	No	No	Yes
N	2000	2000	2000
Pseudo R ²	0.0346	0.0634	0.0744
Log-likelihood	-339.45	-329.34	-325.44
LR χ^2	24.33	44.56	52.35

5.3 Multinomial Logit: Direction of Regeneration Among Supporters

Table 4: Results of BFI on Regeneration Preference Among Supporters

Variable	Public vs Landscape	Commercial vs Landscape
Openness	0.013 (0.076)	-0.015 (0.084)
Conscientiousness	-0.050 (0.081)	-0.082 (0.090)
Extraversion	0.238*** (0.078)	0.249*** (0.087)
Agreeableness	0.028 (0.085)	-0.031 (0.094)
Neuroticism	-0.101 (0.064)	-0.063 (0.072)
Age	-0.010 (0.007)	-0.025*** (0.009)
Education	0.139 (0.104)	0.033 (0.115)
Gender (male=1)	0.300*** (0.115)	-0.232* (0.131)
Income	-0.102 (0.108)	-0.090 (0.121)
House property (owner=1)	0.012 (0.127)	0.300** (0.141)
Marriage (married=1)	0.410*** (0.151)	-0.036 (0.172)
Health (good/excellent=1)	0.043 (0.122)	-0.247* (0.137)
N	1915	1915
Pseudo R ²	0.0310	0.0310
Log-likelihood	-1989.45	-1989.45

参照组: 景观提升; 仅支持改造者, N=1915

5.4 Robustness Checks

This paper employs two robustness check methods: (1) Re-estimate Equation (3) using

the Z-scores of the BFI-10 in place of the BFI-20; (2) Replace the Logit link function $\Lambda(\cdot)$ with the Probit link function (the standard normal cumulative distribution function $\Phi(\cdot)$) separately. Both checks are conducted to verify whether the direction, magnitude (comparable in scale), and significance of personality effects remain stable after changing the measurement approach and distributional assumptions.

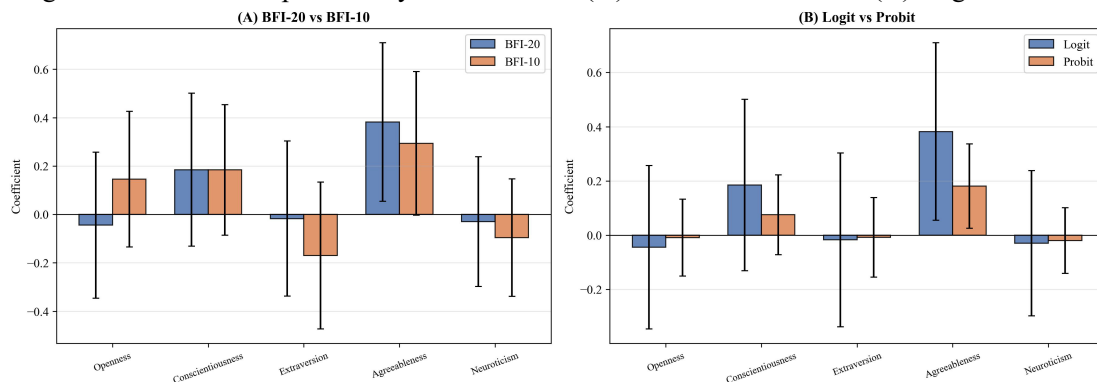
Table 5 reports the results of the two robustness checks. Column 1 presents the baseline binary Logit model using the BFI-20 scale (identical to Column 3 of Table 3). Column 2 replaces the Z-scores of the BFI-20 with the corresponding scores of the BFI-10; Column 3 replaces the Logit estimator with the Probit estimator. Under both alternative specifications, the direction and statistical significance of all personality coefficients remain unchanged. Agreeableness remains the only significant personality predictor of support for regeneration (BFI-10: $\beta = 0.395^{**}$; Probit: $\beta = 0.192^{**}$; the smaller coefficient arises from the scaling of the Probit normal cumulative distribution, not a change in the substantive effect). The coefficients of the control variables are also stable across all specifications. Figure 4 visually compares the coefficient variations of the Big Five personality traits in the two robustness checks.

Table 5: Robustness checks: alternative measurement (BFI-10) and alternative estimator (probit)

	(1) Baseline Logit (BFI-20)	(2) Logit (BFI-10)	(3) Probit (BFI-20)
Openness (z)	-0.047 (0.154)	-0.049 (0.153)	-0.025 (0.079)
Conscientiousness (z)	0.186 (0.161)	0.172 (0.159)	0.097 (0.081)
Extraversion (z)	-0.018 (0.164)	-0.022 (0.161)	-0.013 (0.082)
Agreeableness (z)	0.380** (0.167)	0.395** (0.164)	0.192** (0.083)
Neuroticism (z)	-0.033 (0.137)	-0.041 (0.135)	-0.012 (0.069)
Controls	Yes	Yes	Yes
District FE	Yes	Yes	Yes
N	2,000	2,000	2,000
Pseudo R^2	0.0749	0.0757	0.0748

Note. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Controls: age, education, gender, income, house property, marriage, health.

Fig 4: Robustness of personality coefficients: (A) BFI-20 vs BFI-10; (B) Logit vs Probit



5.4 Heterogeneity Analysis

5.5 Average Marginal Effects and Predicted Probabilities

6 Discussion

7 Conclusion