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Place attachment and community dependence across the rural-urban spectrum: A digital engagement perspective on young adults

Dijitalleşme bağlamında gençlerin yere aidiyeti ve topluluğa bağlılığı: Kırsal-kentsel farklılıklar

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ABSTRACT

This study investigates how place attachment (PA) and community dependence (CD) vary between rural and urban young adults, with a specific focus on the role of digital engagement. A stratified online survey sample of 464 young adults aged 18-30 participated in the study across rural (n=242) and urban (n=222) settings. Digital engagement was operationalized behaviorally through participants' selection of cyberspace/virtual space across everyday activity, happiness, belonging, and third-place preference items. Confirmatory factor analysis (CFA) supported the multidimensional measurement structure of PA and CD. Independent samples t-tests, regression analyses, and multi-group SEM comparisons were used to examine rural-urban differences, the predictive role of length of residency, and variation in PA-CD pathways across digital engagement groups. Rural youth reported significantly stronger PA and CD across all subdimensions. Length of residency positively predicted both PA and CD. Digital engagement was associated with selective variation in the Evaluative Attachment → Evaluative Dependence pathway, while cognitive and affective pathways remained comparatively stable. The findings contribute to place attachment literature by integrating digital spatial orientation into a multidimensional PA-CD framework and highlight the importance of hybrid strategies that connect physical community ties with digitally mediated forms of belonging.

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ÖZ

Bu çalışma, yere aidiyet (YA) ve topluluk bağlılığının (TB) kırsal ve kentsel genç yetişkinler arasında nasıl farklılaştığını, dijital katılımın rolüne odaklanarak incelemektedir. Çalışmaya, 18-30 yaş aralığında 464 genç yetişkinden oluşan tabakalı çevrim içi bir örneklem katılmıştır; örneklem kırsal (n=242) ve kentsel (n=222) yerleşim kategorilerini kapsamaktadır. Dijital katılım, katılımcıların gündelik etkinlik, mutluluk, aidiyet ve üçüncü mekân tercihi maddelerinde sanal ortamı/çevrim içi mekânı seçme durumları üzerinden davranışsal bir mekânsal tercih ölçütü olarak operasyonelleştirilmiştir. Doğrulamalı faktör analizi (CFA), YA ve TB'nin çok boyutlu ölçüm yapısını desteklemiştir. Bağımsız örneklem t-testleri, regresyon analizleri ve çok gruplu YEM karşılaştırmaları; kırsal-kentsel farklılıkları, ikamet süresinin yordayıcı rolünü ve dijital katılım düzeylerine göre YA-TB yollarındaki değişimi incelemek için kullanılmıştır. Bulgular, kırsal gençlerin tüm alt boyutlarda daha yüksek YA ve TB düzeyleri bildirdiğini göstermiştir. İkamet süresi, hem YA hem de TB'nin pozitif bir yordayıcısı olarak ortaya çıkmıştır. Dijital katılım ise özellikle Değerlendirici Aidiyet → Değerlendirici Bağlılık yolunda seçici bir farklılaşma ile ilişkili bulunmuş; bilişsel ve duygusal yollar ise dijital katılım grupları arasında görece istikrarlı kalmıştır. Çalışma, dijital mekânsal yönelimi çok boyutlu bir YA-TB çerçevesine entegre ederek yere aidiyet literatürüne katkı sunmakta ve fiziksel topluluk bağları ile dijital aracılı aidiyet biçimlerini ilişkilendiren hibrit stratejilerin önemini vurgulamaktadır.

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INTRODUCTION

Amid accelerating urbanization and digitalization processes, understanding young adults' bonds with their physical environments has become an increasingly critical endeavor. Place attachment (PA) and community dependence (CD), the emotional and functional ties individuals develop toward their living environment, are widely recognized as core components of social sustainability and community resilience (Low & Altman, 1992; Scannell & Gifford, 2017). Despite growing scholarly attention, rural-urban differences in these bonds remain underexplored, particularly within the rapidly evolving digital landscapes that characterize post-pandemic societies (Markoc & Sari Haksever, 2021). Previous research has consistently demonstrated that rural youth often report higher levels of PA and CD compared to their urban counterparts (Gieling et al., 2017; Belanche et al., 2021). This phenomenon also has the potential to deepen rural-urban disparities (Kiviahho & Einolander, 2023). However, the increasing salience of digital engagement, understood here as the incorporation of cyberspace/virtual space into everyday spatial and social routines, introduces new dynamics that may either complement or reshape traditional place-based bonds (Markoc, 2025; Basaran, 2024). In this study, digital engagement is not treated as general screen time or platform frequency; rather, it is operationalized as a spatialized behavioral preference, based on participants' selection of cyberspace/virtual space as a site of daily activity, happiness, belonging, or third-place experience.

As digitalization offers alternative arenas for identity formation and social belonging, especially among young-

er cohorts, the durability and nature of spatial attachments warrant renewed empirical scrutiny (Markoc, 2019). While the current study models digital engagement as a moderator, it is acknowledged that digital behavior may also exert direct effects on spatial attachment dimensions, particularly through symbolic and identity-based channels. This conceptual possibility, however, lies beyond the scope of the current modeling design. Furthermore, sociodemographic factors such as migration background, residential mobility, and length of residency have been identified as relevant contextual factors in place-based attachment, yet their role alongside digital engagement in shaping PA and CD remains insufficiently understood (Gustafson, 2014; Ergün, 2022). In Türkiye, where urbanization rates have surged from 25% in 1950 to 93% in 2022 (TurkStat, 2023), these questions acquire additional urgency.

Place attachment (PA) denotes the emotional, cognitive, and evaluative bonds individuals develop with specific environments, reflecting both symbolic meanings and functional utilities (Hernández et al., 2014; Scannell & Gifford, 2017). Its development is shaped by demographic factors such as age, gender, education, migration background, length of residency, and mobility patterns (Anton & Lawrence, 2014). Age is positively associated with stronger place bonds, as cumulative experiences deepen emotional connectedness (Lewicka, 2011). Gender-related findings, however, are mixed, with some studies reporting no significant differences in place attachment patterns (Brown et al., 2003).

Education also presents a complex relationship with PA, fostering community integration in some contexts (Dost

& Mazzoli Smith, 2023) but promoting higher mobility and, consequently, weaker place bonds in others (Lewicka, 2005). Length of residency consistently emerges as a robust predictor of PA, emphasizing the role of familiarity, stability, and social integration (Markoc & Cinar, 2017). Conversely, high mobility rates, often facilitated by advancements in ICT, are associated with diminished spatial attachment (Kiviahio & Einolander, 2023). Among younger populations, cyberspace increasingly serves as a novel third place, reshaping spatial bonds and traditional community interactions (Markoc, 2025; Basaran, 2024).

Community dependence (CD) refers to the extent to which individuals rely on local social networks, services, and institutions to meet emotional, social, and practical needs (Theodori & Luloff, 2000). Grounded in Tönnies's (1957) classical concepts of *Gemeinschaft* and *Gesellschaft*, CD highlights the functional dimensions of belonging beyond mere emotional ties. Neighborhood relations, cooperation, and interpersonal trust are key drivers of CD, fostering stronger PA and CD (Tartaglia, 2006). However, growing social and cultural diversity can dilute shared norms and undermine trust, thereby weakening CD (Vogiazides & Kawalerowicz, 2023). Community size further shapes dependence levels; while cohesive small communities often exhibit stronger community attachment or dependence (Theodori & Luloff, 2000; Casakin et al., 2015), some studies propose a U-shaped pattern where both very small and very large communities report higher CD compared to medium-sized ones (Casakin et al., 2015). Finally, rural and urban communities may sustain CD through distinct mechanisms: urban areas may rely more on diverse institutional and professional networks, whereas rural areas may emphasize familiarity, local embeddedness, and everyday interpersonal relations (Belanche et al., 2021).

The rural-urban distinction, often discussed through Tönnies's (1957) classical *Gemeinschaft*–*Gesellschaft* framework, remains crucial for understanding PA and CD. Rural communities, marked by lower population density, stronger social cohesion, and greater environmental familiarity, typically foster higher levels of PA and CD compared to urban settings (Belanche et al., 2021). However, advancements in communication technologies and mobility have increasingly blurred these distinctions, making residential choices more voluntary and driven by lifestyle preferences, digital access, and remote work opportunities (Markoc & Cinar, 2017). The COVID-19 pandemic accelerated urban-to-rural migration, reinforcing the appeal of rural environments for health, safety, and resilience while maintaining local social ties despite mobility restrictions (Dyrting et al., 2020; González-Leonardo et al., 2022).

Simultaneously, digital engagement has profoundly reshaped spatial relationships. Digital platforms allow individuals to sustain social connections without geograph-

ic proximity, potentially reshaping place-based emotional bonds and forms of reliance on local communities (Vogiazides & Kawalerowicz, 2023). Among young adults, cyberspace increasingly functions as an alternative “third place,” coexisting with, and in some cases partly substituting for, physical community ties (Basaran, 2024; Markoc, 2019). Thus, understanding how digital engagement moderates the relationships between PA and CD is essential for advancing comprehensive models of social sustainability across rural and urban contexts.

Addressing these gaps, this study pursues a focused inquiry into: (1) differences in place attachment and community dependence between rural and urban young adults, (2) the moderating role of digital engagement in these relationships, and (3) the role of selected sociodemographic factors, particularly length of residency, in shaping spatial bonds. The study was conducted with young adults, a group characterized by high levels of digital engagement (Markoc & Sari Haksever, 2019). By adopting a multidimensional framework that distinguishes cognitive, affective, and evaluative dimensions of attachment (Belanche et al., 2017), and using CFA, SEM, and multi-group comparisons, this study seeks to advance theoretical understanding while offering practical insights for youth-centered community development and sustainable spatial planning. Table 1 illustrates the research design.

Anchored in the presented research design, the next section delineates the conceptual framework and formalizes the study's hypotheses.

RESEARCH OBJECTIVES AND HYPOTHESES

Building upon the identified research gaps, the present study seeks to advance the understanding of how young adults develop emotional and functional bonds with their living environments across rural and urban contexts. While place attachment (PA) and community dependence (CD) have been widely studied, direct rural-urban comparative analyses remain scarce, particularly regarding the emerging influence of digital engagement on spatial relationships. The transformative impact of digitalization, accelerated by the COVID-19 pandemic, has blurred traditional spatial boundaries, creating new forms of attachment that transcend physical environments. However, empirical investigations integrating digital engagement as a moderating factor within the PA and CD frameworks are notably lacking. This study addresses this gap by empirically examining how digital behaviors are associated with changing patterns of spatial belonging among young adults. Specifically, the study explores differences in PA and CD between rural and urban young adults, while considering selected sociodemographic factors, including migration background, education level, length of residency, dwelling type, and housing mobility patterns, as contextual variables. Furthermore, it

Table 1. Research design

Aspect	Details
Research purpose	To examine rural-urban differences in place attachment (PA) and community dependence (CD) among young adults, considering digital engagement and selected sociodemographic factors.
Research design	Cross-sectional, quantitative, comparative survey design.
Sampling method	Stratified, quota-informed online survey sampling across rural and urban settlement categories and Türkiye's seven geographical regions.
Sample size	N=464 young adults aged 18-30: Rural (n=242; 52.2%) and Urban (n=222; 47.8%).
Data collection period	November 2022-February 2023; data were collected through an online survey platform.
Instruments	Socio-demographic questionnaire; Place Attachment and Community Dependence Scales; Behavioral Digital Engagement Measure.
Digital engagement measure	Operationalized through participants' selection of cyberspace/virtual space across everyday activity, happiness, belonging, and third-place preference items.
Main statistical analyses	Descriptive statistics, independent samples t-tests/Welch-adjusted comparisons, effect sizes, CFA, regression analyses, and multi-group SEM moderation analysis.
Ethics approval	Obtained from Yıldız Technical University Ethics Committee, Protocol No. 2022.10.

The research design table was developed by the authors.

uniquely examines whether digital engagement moderates the strength of emotional and functional bonds to place.

Therefore, the primary aim of this research is twofold: (1) to deepen theoretical insights into the evolving nature of spatial bonds in the digital age, and (2) to inform practical strategies for fostering sustainable, resilient communities. In line with these aims, the study is guided by the following specific research objectives, which collectively seek to enrich conceptual frameworks and offer actionable insights for policymakers, urban planners, and community developers.

O1: Compare levels of place attachment (PA) and community dependence (CD) among young adults in rural and urban communities.

O2: Investigate whether digital engagement is associated with variation in the PA-CD relationship, particularly in the evaluative dimension.

O3: Consider selected sociodemographic factors, including gender, age, migration background, education level, length of residency, dwelling type, and housing mobility, as contextual variables in interpreting PA and CD patterns.

O4: Advance a novel conceptual framework by integrating digitalization trends into traditional theories of spatial bonding, contributing to the discourse on social sustainability in post-pandemic societies.

Grounded in these objectives and supported by existing theoretical and empirical literature, the following hypotheses were formulated (Table 2):

Rural environments typically offer greater environmental familiarity, social continuity, and tightly knit community structures, which are conducive to the development of stronger emotional bonds to place (Anton & Lawrence, 2014; Belanche et al., 2021).

Table 2. Overview of hypotheses and corresponding statistical analyses

Code	Hypothesis Statement	Statistical Test Used
H1	Young adults residing in rural communities will report higher levels of place attachment than those in urban communities.	Independent Samples t-test
H2	Young adults residing in rural communities will report higher levels of community dependence than their urban counterparts.	Independent Samples t-test
H3	Higher levels of digital engagement are expected to be associated with a weaker PA-CD relationship, particularly in the evaluative dimension.	Multi-Group SEM Analysis
H4	Longer residential duration will positively predict both place attachment and community dependence among young adults.	Linear Regression Analysis

The hypotheses and corresponding statistical analyses were developed by the authors based on the study's conceptual framework.

H1: Young adults residing in rural communities will report higher levels of place attachment than those residing in urban communities.

Limited institutional diversification, stronger reliance on local interpersonal networks, and the centrality of everyday community relations in rural settings are expected to foster stronger functional dependencies than in urban environments, where individuals may access a wider range of institutional, professional, and service-based alternatives (Kapucu et al., 2024; Lu et al., 2018).

H2: Young adults residing in rural communities will report higher levels of community dependence than their urban counterparts.

Digital technologies may provide alternative arenas for fulfilling emotional, social, and informational needs, which may be associated with a reduced reliance on physical community ties in some contexts (Serban et al., 2021; Markoc, 2025).

H3: Higher levels of digital engagement are expected to be associated with a weaker PA-CD relationship, particularly in the evaluative dimension.

Extended time spent in a location fosters familiarity, emotional investment, and the accumulation of social ties, thereby strengthening both emotional attachment and functional reliance on the community (Markoc & Sari Haksever, 2021; Trabka et al., 2022).

H4: Longer residential duration will positively predict both place attachment and community dependence among young adults.

Analysis Plan

To empirically test the proposed hypotheses, a structured, multi-phase statistical analysis strategy was implemented. First, descriptive statistics were computed to summarize the sociodemographic characteristics of the sample and the key study constructs, including PA, CD, and digital engagement.

To examine H1 and H2, independent samples t-tests were conducted to compare PA and CD levels between rural and urban participants. Levene's Test for Equality of Variances was used to assess the homogeneity of variance assumption. When this assumption was violated, Welch-adjusted t statistics were reported. In addition to significance testing, effect sizes were calculated using Cohen's d to evaluate the practical magnitude of rural-urban differences.

To assess H3, multi-group SEM was used to examine whether PA-CD pathways differed across digital engagement groups. Digital engagement was measured through participants' cyberspace/virtual-space selections across four behavioral spatial-preference indicators. Scores ranged from 0 to 4, with higher scores indicating stronger digital spatial orientation. Participants were then grouped into

Low, Neutral, High, and Super High digital engagement categories based on their total cyberspace/virtual-space selection scores. This approach enabled comparison of PA-CD pathway strength across different levels of digital spatial orientation.

To evaluate H4, regression analyses were conducted to determine whether length of residency predicted PA and CD. Length of residency was treated as an ordinal predictor, and model results were interpreted using regression coefficients, explained variance values (R^2), and significance levels.

Prior to hypothesis testing, the psychometric properties of the PA and CD measures were examined through confirmatory factor analysis (CFA). Model fit indices, internal consistency indicators, and convergent validity measures were evaluated to assess the adequacy of the measurement model. Statistical analyses were conducted using IBM SPSS Statistics 28.0 and Python-based packages, including semopy, numpy, pandas, scipy, statsmodels, openpyxl, and matplotlib.

METHODOLOGY

Participants

The present study employed a stratified, quota-informed online survey sampling strategy to enable analytical comparison between rural and urban young adults across Türkiye. Stratification was based on two criteria: geographical region and residential context. Participants were recruited from Türkiye's seven geographical regions—Marmara, Aegean, Mediterranean, Central Anatolia, Eastern Anatolia, Southeastern Anatolia, and Black Sea—and categorized according to rural or urban residential status. Because recruitment was conducted through online channels, the sample should be understood as a stratified, quota-informed online survey sample rather than a strictly probability-based random sample.

The final sample consisted of 464 young adults aged between 18 and 30 years, including 242 rural participants (52.2%) and 222 urban participants (47.8%). The rural-urban distribution was intentionally balanced to support comparative analysis between settlement categories rather than to reproduce the national rural-urban population distribution. The sample size was considered adequate for the planned statistical analyses, including group comparisons, regression analyses, and structural equation modeling procedures. Accordingly, the findings should be interpreted as analytically informative for rural-urban comparison rather than statistically representative of the entire young adult population in Türkiye (Table 3).

Instruments and Measures

Data were collected through a structured questionnaire comprising three sections: socio-demographic informa-

Table 3. Participants' socio-demographic characteristics

Category	Rural (%)	Urban (%)
Gender (Female / Male)	47.1 / 52.9	46.8 / 53.2
Age Groups (18-22 / 23-26 / 27-30)	35.5 / 35.1 / 29.3	47.3 / 28.8 / 23.9
Migration Background (TC Citizens / Others)	94.6 / 5.4	86.9 / 13.1
Education (Primary / High School / Bachelor / Master / PhD)	12.4 / 34.7 / 42.1 / 8.3 / 2.5	10.8 / 14.4 / 51.8 / 20.7 / 2.3
Type of Dwelling (Family Home / Homeowner / Dormitory / Short-term Rental)	57.0 / 32.6 / 9.5 / 0.8	32.4 / 37.4 / 22.1 / 8.1
Length of Residency (>10 years / 3-10 years / 1-3 years / <1 year)	52.1 / 19.8 / 23.1 / 5.0	14.4 / 20.7 / 35.6 / 29.3
Mobility Rate (None / 1 time / 2 times / >2 times)	57.0 / 30.6 / 2.5 / 9.9	10.8 / 39.6 / 36.5 / 13.1

Values indicate within-group percentages for rural and urban participants.

tion, a behavioral digital engagement measure, and PA and CD scales assessing cognitive, affective, and evaluative dimensions (Table 4).

- **Socio-Demographic Information:** Participants provided information regarding gender, age, education level, migration background, dwelling type, length of residency, and residential mobility. These variables were included because previous studies have shown that residential stability, dwelling type, migration background, and mobility patterns may shape individuals' relationships with place and community (Anton & Lawrence, 2014; Lewicka, 2011; Markoc, 2017). Urban and rural classifications were assigned based on participants' reported residential context and administrative definitions outlined by the Turkish Statistical Institute (TurkStat).
- **Place Attachment and Community Dependence Scales:** PA and CD were assessed using an adapted version of the scale developed by Belanche et al. (2017), which captures cognitive, affective, and evaluative dimensions of place-based identity and dependence. The items were adapted to the present

research context and reviewed for conceptual and linguistic clarity. Each dimension was represented by three items.

- **Behavioral Digital Engagement Measure:** Digital engagement was operationalized as a behavioral spatial-preference measure rather than as general screen time or platform-use frequency. Participants' selection of cyberspace/virtual space across four domains, everyday activity, happiness, belonging, and third-place preference, was used to indicate the extent to which digital spaces were integrated into their everyday spatial experience. Each cyberspace/virtual-space selection was coded as 1, while non-digital spatial selections were coded as 0, producing a total digital engagement score ranging from 0 to 4. Higher scores indicated stronger digital spatial orientation. This operationalization captures participants' orientation toward digital environments, not the overall intensity of their digital media use.

The psychometric properties of the PA and CD measures were subsequently examined through confirmatory factor analysis (CFA), composite reliability (CR), average variance extracted (AVE), and Cronbach's alpha values. The

Table 4. Questionnaire sections

Instrument	Description	Example items	Number of items
Socio-demographic questionnaire	Assessed gender, age, education, migration background, dwelling type, length of residency, and mobility rate. Urban/rural status based on TurkStat definitions.	-	7 socio-demographic variables
PA and CD scale	Adapted from Belanche et al. (2017). Measures cognitive, affective, and evaluative attachment to place and community. The items were adapted to the present research context and reviewed for conceptual and linguistic clarity.	"I feel attached to this place." (Affective Attachment)	3 items per subdimension
Digital engagement measure	Behavioral spatial-preference measure based on cyberspace/virtual space selection across everyday activity, happiness, belonging, and third-place preference domains.	"Selection of cyberspace/virtual space as a site of everyday activity"	4 behavioral indicators

The questionnaire sections and measurement structure were developed by the authors based on the study's conceptual framework and adapted scale items.

results of these validation procedures are reported in the Findings section.

Procedure

Data collection was conducted through an online survey administered between November 2022 and February 2023. Participants were recruited through social media platforms, including Instagram and WhatsApp, as well as official university e-mail channels. These channels were used to reach young adults across different geographical regions and residential contexts in Türkiye.

Before participation, all respondents provided informed consent electronically. Participants were informed about the voluntary nature of the study, the anonymity of their responses, their right to withdraw from the survey at any time, and the academic purpose of the research. The study was approved by the Yıldız Technical University Research Ethics Committee (Protocol Number: 2022.10) and was conducted in accordance with standard ethical principles for research involving human participants.

Data quality checks were conducted before the main analyses. Missing data were examined and found to be below 5% of the dataset. Little's MCAR test indicated that missingness did not systematically bias the data structure ($p > 0.05$). Cases with incomplete responses were handled through list-wise deletion. Multivariate outliers were examined using Mahalanobis distance. Following data quality checks, the final analytical sample consisted of 464 valid responses.

Data Analysis

Preliminary statistical procedures, including descriptive analyses, group comparisons, and effect size estimations, were conducted using IBM SPSS Statistics 28.0. Advanced modeling procedures, including confirmatory factor analysis (CFA), path estimation, and multi-group SEM comparisons, were implemented in Python using the semopy package. Complementary data operations and transformations were carried out using numpy, pandas, and scipy, while regression-based procedures were conducted using statsmodels. Data handling and import/export procedures were facilitated by openpyxl.

Descriptive statistics

Descriptive statistics were used to summarize participants' sociodemographic characteristics, PA and CD scores, and digital engagement indicators. Means and standard deviations were reported for continuous variables, while frequencies and percentages were reported for categorical variables.

Group comparisons

To examine rural-urban differences in PA and CD, independent samples t-tests were conducted. Levene's Test for Equality of Variances was used to assess the homogeneity of variance assumption. When this assumption was violated,

Welch-adjusted t statistics were reported. Cohen's d values were calculated to evaluate the practical magnitude of rural-urban differences.

Measurement model validation

Confirmatory factor analysis (CFA) was conducted to examine the measurement structure of the cognitive, affective, and evaluative dimensions of PA and CD. The CFA was conducted using six subdimension-level composite indicators representing cognitive, affective, and evaluative dimensions of PA and CD. Model fit was evaluated using multiple fit indices, including the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Threshold criteria were interpreted as CFI and TLI $\geq .90$, RMSEA $\leq .08$, and SRMR $\leq .08$, while recognizing that fit indices should be evaluated collectively rather than in isolation. Convergent validity was assessed through Average Variance Extracted (AVE), and internal consistency was examined using Composite Reliability (CR) and Cronbach's alpha, with values above .70 considered acceptable for reliability indicators.

Moderation analysis: Digital engagement

To examine H3, multi-group SEM comparisons were conducted to assess whether PA $\rightarrow$ CD pathways differed across digital engagement groups. Digital engagement was operationalized through participants' cyberspace/virtual-space selections across four behavioral spatial-preference indicators. Participants were grouped according to their level of digital spatial orientation, and PA $\rightarrow$ CD path coefficients were compared across groups. Because four digital engagement groups were compared, chi-square difference tests were interpreted with three degrees of freedom for each pathway-level comparison. Changes in chi-square values ($\Delta\chi^2$) and associated p-values were used to evaluate whether differences in path coefficients across digital engagement groups were statistically significant.

Predictive role of length of residency

To examine H4, two separate regression analyses were conducted to assess whether length of residency predicted PA and CD. Length of residency was treated as an ordinal predictor. Regression coefficients, explained variance values (R^2), and significance levels were used to interpret the predictive role of residential duration.

Through this multi-stage analytical strategy, the study systematically examined rural-urban differences, measurement validity, digital engagement-based variation in PA $\rightarrow$ CD pathways, and the predictive role of length of residency in shaping place-based bonds among young adults.

FINDINGS

Preliminary Analyses

Descriptive statistics were computed to summarize the demographic characteristics and core study variables, including cognitive, affective, and evaluative dimensions of PA and CD. Measures of central tendency (mean, median) and dispersion (standard deviation, range) were reported for continuous variables, and frequency distributions were provided for categorical variables.

Hypotheses 1 and 2: Rural-Urban Group Comparisons

To examine Hypotheses 1 and 2, which proposed rural-urban differences in place attachment (PA) and community dependence (CD), independent samples t-tests were conducted across six subdimensions: cognitive, affective, and evaluative PA, and their corresponding CD subdimensions. Levene's Test for Equality of Variances indicated variance heterogeneity in most comparisons; therefore, Welch-adjusted t statistics are reported for rural-urban group comparisons.

Table 5 presents the descriptive statistics, Welch-adjusted t-values, significance levels, and effect sizes (Cohen's d). The results indicated significant rural-urban differences across all PA and CD subdimensions (all $p < .001$), with rural participants reporting consistently higher scores than urban participants. The largest effect size was observed for Affective Place Attachment ($d=2.33$), followed by Affective Community Dependence ($d=2.07$) and Cognitive Place Attachment ($d=1.80$). The remaining effects were also large in magnitude, including Evaluative Place Attachment ($d=1.43$), Cognitive Community Dependence ($d=1.22$), and Evaluative Community Dependence ($d=1.03$). Even the smallest observed effect size exceeded conventional thresholds for a large effect indicating that the rural-urban differences were not only statistically significant but also practically substantial.

Taken together, these findings provide strong support for H1 and H2. Rural young adults reported significantly stronger cognitive, affective, and evaluative attachments

to place, as well as significantly higher levels of cognitive, affective, and evaluative community dependence. The use of Welch-adjusted t-tests ensured appropriate group comparisons where variance heterogeneity was present, while Cohen's d values demonstrated that the observed rural-urban differences were large in practical terms. These results highlight the importance of geographic context in explaining psychosocial belonging and place-based community reliance among young adults.

Measurement Model Validation (Confirmatory Factor Analysis)

To assess the measurement validity of the multidimensional PA and CD structure, confirmatory factor analysis (CFA) was conducted using six subdimension-level composite indicators. Model adequacy was evaluated using a combination of absolute, incremental, and residual-based fit indices.

The CFA results provided mixed but usable support for the multidimensional measurement model: $\chi^2(6)=211.63$, $p<0.001$; CFI=0.978; GFI=0.977; AGFI=0.942; NFI=0.977; TLI=0.944; RMSEA=0.157; and SRMR=0.072. Incremental fit indices indicated good-to-excellent fit, and SRMR was within the acceptable range. However, RMSEA exceeded the conventional threshold. Given the very low degrees of freedom of the model and the use of subdimension-level composite indicators, RMSEA was interpreted with caution and was not used as the sole criterion for evaluating model adequacy. Accordingly, the measurement model was evaluated based on the convergence of multiple fit indices rather than RMSEA alone.

Convergent validity was supported through Average Variance Extracted (AVE) values, which exceeded the recommended minimum of 0.50 across the measured dimensions, ranging from 0.62 to 0.64. Internal consistency was supported by Composite Reliability (CR) and Cronbach's alpha coefficients, with CR values ranging from .89 to .91 and Cronbach's alpha values ranging from 0.88 to 0.90. Taken together, these results indicate satisfactory reliability and convergent validity of the PA and CD measures,

Table 5. Mean and standard deviation of study variables by community type

Dimension	Variable	Rural M±SD	Urban M±SD	Welch's t	p	Cohen's d
Cognitive	Cognitive PA	3.97±1.11	2.11±0.95	19.52	< .001	1.80
Cognitive	Cognitive CD	3.95±1.17	2.63±0.97	13.25	< .001	1.22
Affective	Affective PA	4.19±1.10	1.84±0.89	25.33	< .001	2.33
Affective	Affective CD	4.14±1.18	2.01±0.83	22.61	< .001	2.07
Evaluative	Evaluative PA	4.30±1.07	2.75±1.11	15.35	< .001	1.43
Evaluative	Evaluative CD	4.24±1.21	3.01±1.18	11.09	< .001	1.03

Values are reported as mean±standard deviation. Welch's t-test was used for rural–urban comparisons due to variance heterogeneity; Cohen's d indicates effect size.

while also suggesting that the measurement model should be interpreted with caution due to the elevated RMSEA value.

After assessing reliability, convergent validity, and overall model fit, the analysis proceeded to the moderation test examining whether PA → CD pathways differed across digital engagement groups.

Moderation Analysis: The Role of Digital Engagement

To test Hypothesis 3 (H3), participants were categorized into four digital engagement levels: Super High, High, Neutral, and Low. Grouping was based on participants' cyberspace/virtual-space selection scores across the behavioral spatial-preference indicators. A multi-group SEM approach was employed to examine whether PA → CD pathways differed across digital engagement groups (Table 6).

The results indicated a statistically significant group difference only for the Evaluative Attachment → Evaluative Dependence pathway, $\Delta\chi^2(3)=8.45$, $p=0.038$. In contrast, the cognitive and affective pathways remained statistically stable across digital engagement groups, as indicated by non-significant chi-square difference tests. Participants with Super High digital engagement showed a weaker Evaluative Attachment → Evaluative Dependence pathway ($\beta=0.50$) than participants with Low digital engagement ($\beta=0.82$). This pattern partially supports H3, suggesting that digital engagement is associated with selective attenuation of the evaluative PA-CD relationship rather than a uniform weakening of all PA-CD pathways.

This result is important because the evaluative dimension reflects symbolic meanings, self-concept-related judgments, and identity-based evaluations of place. Compared with cognitive attachment, which is more closely linked to familiarity and spatial knowledge, and affective attachment, which is grounded in emotional comfort and lived experience, evaluative attachment may be more open to digitally mediated forms of belonging. In this sense, the findings suggest that digital engagement is most strongly associated with the symbolic and evaluative conversion of place attachment into community dependence.

Cognitive and affective pathways, by contrast, appeared comparatively stable across digital engagement groups. This may indicate that attachments based on routine, familiarity, embodied experience, and emotional connection to physical places are less variable across different levels of digital engagement. Therefore, the moderation pattern should not be interpreted as evidence that digital engagement generally reduces place attachment or community dependence. Rather, the results point to a more specific form of variation in the evaluative PA → CD pathway.

Although digital engagement was modeled as a moderator in this study, its broader relationship with spatial belonging may be more complex. Future research may further examine whether digital behaviors also have direct associations with specific dimensions of PA and CD, particularly those related to symbolic identity, self-expression, and hybrid physical-digital forms of belonging.

Predictive Role of Length of Residency

To evaluate Hypothesis 4 (H4), two separate linear regression analyses were conducted to examine whether length of residency predicted young adults' PA and CD levels. Length of residency was entered as an ordinal independent variable, with higher values indicating longer-term residence in the same location.

The first regression model showed that length of residency significantly predicted composite PA scores, explaining 22.6% of the variance ($R^2=.226$, $p<0.001$). Similarly, the second regression model showed that length of residency significantly predicted composite CD scores, explaining 18.8% of the variance ($R^2=0.188$, $p<0.001$). These findings indicate that longer residential duration is positively associated with stronger place attachment and greater community dependence. Thus, H4 was supported. Table 7 summarizes the hypothesis testing results by aligning each hypothesis with the corresponding statistical method, key findings, and conclusion.

DISCUSSION

The present study examined how place attachment (PA), community dependence (CD), and digital engage-

Table 6. Moderation analysis: Multi-group sem path coefficients across digital engagement groups

Path	Super High β	High β	Neutral β	Low β	$\Delta\chi^2_{df=3}$	p-value	Moderation Supported
Cognitive Attachment → Dependence	0.80	0.82	0.83	0.84	1.15	.765	No
Affective Attachment → Dependence	0.89	0.90	0.91	0.91	0.92	.821	No
Evaluative Attachment → Dependence	0.50	0.58	0.70	0.82	8.45	.038	Yes

β values represent standardized path coefficients. $\Delta\chi^2$ values indicate chi-square difference tests used to assess whether each PA-CD pathway differed significantly across digital engagement groups.

Table 7. Summary of hypothesis testing results

Hypothesis	theoretical statement	Statistical method	Key results	Conclusion
H1	Rural youth will report higher place attachment than urban youth.	Independent samples t-test / Welch-adjusted comparison	All PA subdimensions were significantly higher in the rural group.	Supported
H2	Rural youth will report higher community dependence than urban youth.	Independent samples t-test / Welch-adjusted comparison	All CD subdimensions were significantly higher in the rural group.	Supported
H3	Higher digital engagement is expected to be associated with a weaker PA-CD relationship, particularly in the evaluative dimension.	Multi-group SEM comparison	Only the Evaluative Attachment → Evaluative Dependence pathway differed significantly across digital engagement groups, $\Delta\chi^2(3)=8.45$, $p=.038$.	Partially supported
H4	Longer residential duration will positively predict PA and CD.	Linear regression analysis	Length of residency significantly predicted PA ($R^2=.226$, $p < .001$) and CD ($R^2=.188$, $p < .001$).	Supported

PA=place attachment; CD=community dependence. The table summarizes the hypotheses, corresponding statistical methods, key findings, and support status based on the study results.

ment intersect among rural and urban young adults. Rather than treating spatial belonging as a single emotional bond, the study adopted a multidimensional framework that distinguishes cognitive, affective, and evaluative dimensions of PA and CD. This distinction is important because the findings show that geographic context and digital engagement are not associated with all dimensions of spatial belonging in the same way.

Overall, the results supported the rural-urban comparison hypotheses by showing that rural youth reported stronger PA and CD across cognitive, affective, and evaluative subdimensions. This finding reinforces the continuing relevance of geographic embeddedness in an era often described through mobility, digitalization, and hybrid social interaction. Rural contexts appear to sustain stronger place-based bonds not only through emotional familiarity, but also through functional reliance on local networks, services, and community relations.

At the same time, the findings indicate that digital engagement is not uniformly associated with weaker place-based belonging. Instead, its association appears to be selective: the Evaluative Attachment → Evaluative Dependence pathway varied significantly across digital engagement groups, while cognitive and affective PA-CD pathways remained comparatively stable. This pattern suggests that digital engagement is most relevant to symbolic, identity-related, and evaluative aspects of place, rather than to all forms of attachment or dependence.

Interpretation of Main Findings

The first major finding is that rural young adults reported significantly higher PA across all measured subdi-

mensions. This result is consistent with the view that rural environments often provide stronger continuity between social relations, everyday routines, and environmental familiarity. In such contexts, place may function not only as a physical setting but also as a shared social and symbolic environment. The higher rural scores across cognitive, affective, and evaluative PA suggest that rural belonging is multidimensional: participants do not merely know their environments better, but also report stronger emotional and evaluative bonds with them.

The second major finding is that rural youth also reported higher CD across all corresponding dimensions. This suggests that community dependence remains closely tied to local embeddedness. Rural settings may foster stronger functional reliance because social support, daily interaction, and access to community resources are more locally organized. In contrast, urban settings may offer wider institutional and service alternatives, which can reduce dependence on immediate local networks. Thus, lower urban CD should not necessarily be interpreted as weaker social capacity, but rather as a different structure of reliance and access.

The third and theoretically most distinctive finding concerns digital engagement. The moderation analysis showed that only the Evaluative Attachment → Evaluative Dependence pathway differed significantly across the four digital engagement groups. This is important because the evaluative dimension is more closely connected to symbolic meanings, identity judgments, and self-concept-related interpretations of place. Unlike cognitive attachment, which is linked to familiarity and knowledge, or affective attachment, which is grounded in emotional comfort and lived

experience, evaluative attachment may be more open to hybrid physical-digital forms of belonging.

This finding does not imply that digital engagement generally weakens place attachment or community dependence. Rather, it suggests that the symbolic translation of attachment into dependence may vary among young adults with different levels of digital spatial orientation. Digital environments may offer additional arenas for identity expression, social recognition, and belonging, which may partly reshape how young adults connect symbolic evaluations of place to functional reliance on local communities. In this sense, the findings support a more nuanced interpretation: digital engagement appears to be associated with the evaluative pathway of spatial belonging, not with a generalized decline of place-based bonds.

The fourth finding concerns length of residency. Longer residential duration positively predicted both PA and CD, confirming the importance of temporal continuity in the formation of place-based bonds. Time spent in a location allows individuals to accumulate memories, routines, social ties, and practical knowledge of local resources. These accumulated experiences may strengthen both emotional attachment and functional dependence. This finding also helps explain why rural participants, who reported longer residential continuity, may exhibit stronger PA and CD patterns.

Taken together, the findings suggest that spatial belonging among young adults is shaped through the interaction of three forces: geographic context, temporal continuity, and digital spatial orientation. Rural-urban differences remain important, but they should be understood alongside changing digital practices and differentiated dimensions of attachment and dependence.

Theoretical Contributions

This study contributes to the literature in four ways.

First, it extends rural-urban place attachment research by showing that rural-urban differences remain meaningful among digitally engaged young adults. Even in a context where social interaction increasingly extends into digital environments, rural participants reported stronger PA and CD across all measured dimensions. This finding suggests that digitalization does not eliminate the importance of geographic embeddedness.

Second, the study strengthens multidimensional approaches to PA and CD. By distinguishing cognitive, affective, and evaluative dimensions, the findings show that place-based belonging is not a single uniform construct. The rural-urban pattern was consistent across all dimensions, but the digital engagement pattern was selective, emerging only in the evaluative PA-CD pathway. This supports the analytical value of treating PA and CD as multidimensional constructs.

Third, the study contributes to digital spatiality research by operationalizing digital engagement as a behavioral spatial-preference measure rather than as screen time or platform-use frequency. This is important because it treats digital environments as part of young adults' spatial lives, not merely as media-use contexts. The findings therefore connect digital engagement to spatial belonging in a more place-sensitive way.

Fourth, the study suggests that evaluative attachment may be the dimension most closely linked to hybrid forms of belonging. Since evaluative attachment involves symbolic judgments and identity-related meanings, it may be more responsive to digital environments where young adults construct, display, and negotiate identity. This does not mean that digital engagement replaces place-based belonging; rather, it suggests that digital and physical forms of belonging may interact most strongly at the symbolic and evaluative level.

Practical Implications

The findings offer practical implications for policymakers, urban planners, and community organizations seeking to strengthen youth engagement, spatial belonging, and community resilience across different settlement contexts.

For rural communities, the strong PA and CD scores suggest the importance of sustaining local embeddedness, social familiarity, and everyday community interaction. Community-based programs, youth participation initiatives, local cultural activities, and place-based development strategies may help maintain young adults' emotional and functional bonds with their living environments. Such strategies are particularly important for rural sustainability because they may support youth retention, intergenerational continuity, and community resilience.

For urban contexts, the findings point to the need to create stronger opportunities for affective and cognitive connection to place. Green spaces, neighborhood-based events, participatory planning processes, and youth-oriented public spaces can help strengthen emotional comfort, familiarity, and local identification in more mobile and heterogeneous urban environments. Urban planning strategies should therefore move beyond physical infrastructure alone and consider how everyday social interaction, memory, and participation contribute to place-based belonging.

For digital engagement strategies, the results suggest that digital spaces should be understood as part of young adults' spatial lives rather than as separate from physical environments. Since digital engagement was associated particularly with variation in the evaluative PA-CD pathway, community initiatives may benefit from hybrid approaches that connect online interaction with local participation. Digital platforms can be used to support local identity, communicate community events, encourage youth partic-

ipation, and strengthen links between physical place and symbolic belonging.

Accordingly, digital tools should be designed not as substitutes for physical community-building efforts, but as complementary infrastructures that reinforce local identity, participation, and shared spatial experience.

Limitations and Future Directions

Despite its contributions, several limitations should be acknowledged.

First, the cross-sectional design limits causal interpretation. The findings identify associations between rural-urban context, digital engagement, PA, and CD, but they do not establish causal relationships. Longitudinal research would be useful for examining how place attachment and community dependence evolve over time and how digital engagement may influence these processes across different life stages.

Second, the study was conducted in the Turkish context and focused on young adults aged 18-30. Therefore, the findings may not be directly generalizable to other cultural settings, age groups, or settlement systems. Future studies could test the model in different national contexts and among different generations to examine whether similar patterns emerge.

Third, digital engagement was operationalized through survey-based behavioral spatial-preference indicators rather than objective screen-time data or platform-use frequency. This was appropriate for the present study because the aim was to capture participants' spatial orientation toward cyberspace/virtual space. However, future research may combine spatial-preference measures with more detailed indicators of digital behavior, such as platform type, frequency of online interaction, and forms of digital community participation.

Fourth, the binary rural-urban classification may oversimplify the continuum of settlement types. Future studies could examine peri-urban, suburban, small-town, and metropolitan subcontexts to better capture the diversity of contemporary spatial experience.

Fifth, the CFA results should be interpreted with caution because RMSEA exceeded the conventional threshold, despite good-to-excellent incremental fit indices and acceptable SRMR. This issue may partly reflect the low degrees of freedom and the use of subdimension-level composite indicators in the measurement model. Future studies using larger, more heterogeneous samples and item-level CFA procedures may further test the multidimensional PA and CD measurement structure across different contexts.

Finally, the current model examined digital engagement as a moderator. Future research may also investigate whether digital engagement has direct associations with specif-

ic dimensions of PA and CD, particularly those related to symbolic identity, self-expression, and hybrid physical-digital forms of belonging. Taken together, these limitations point to the need for further research on how young adults form and maintain spatial belonging across physical, digital, and hybrid environments.

CONCLUSION

In an era where urbanization, digitalization, and demographic transitions reshape spatial relationships, understanding how young adults form emotional and functional bonds with their living environments remains a critical issue for social sustainability and community planning.

This study examined place attachment, community dependence, and digital engagement among rural and urban young adults. By adopting a multidimensional framework, the study distinguished cognitive, affective, and evaluative dimensions of PA and CD and investigated how these dimensions vary across geographic and digital contexts.

The findings indicate that rural youth reported stronger PA and CD across all measured subdimensions. This suggests that rural contexts continue to support strong emotional, cognitive, evaluative, and functional bonds to place, even in a period marked by digitalization and increased mobility. Length of residency also emerged as a positive predictor of both PA and CD, highlighting the importance of temporal continuity, accumulated experience, and local embeddedness in the formation of spatial belonging.

The study also showed that digital engagement was associated with selective variation in the Evaluative Attachment → Evaluative Dependence pathway, while cognitive and affective PA-CD pathways remained comparatively stable across digital engagement groups. This finding suggests that digital engagement is most closely related to the symbolic and evaluative dimension of spatial belonging rather than to a generalized decline in place attachment or community dependence.

Theoretically, the study contributes to place attachment literature by integrating digital engagement into a multidimensional PA-CD framework and by showing that rural-urban differences remain meaningful in the digital age. Practically, the findings point to the importance of strategies that support both physical community ties and digitally mediated forms of belonging. Community development and planning approaches should therefore recognize young adults' spatial lives as increasingly hybrid, shaped by physical environments, local relationships, and digital forms of interaction.

Future research should continue to examine how young adults negotiate attachment, dependence, and identity across physical, digital, and hybrid spaces. Strengthening

resilient bonds between individuals and their environments remains important for social sustainability, youth engagement, and inclusive community development.

Ethic Statement: The study fully complied with the ethical principles outlined in the Declaration of Helsinki and was approved by the Yıldız Technical University Research Ethics Committee (Protocol Number: 2022.10). Participants were informed about the purpose of the study, the voluntary nature of participation, anonymity, their right to withdraw from the study at any point without any negative consequences, and the academic use of the data. All data were collected anonymously and used exclusively for academic purposes. No directly identifying personal information was collected by the researchers during the survey process.

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