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Research Paper

Place attachment, Stress, Pro-environmental Behavior and Life Satisfaction among Delhi Metro Commuters: A Sustainable Outlook

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ABSTRACT

The Urban Transit System is one of the major communal developments that shapes subjective experiences and conduct of human beings. The research seeks to investigate the correlation between stress, place attachment, pro-environmental behavior, and life satisfaction, among Delhi Metro Commuters. A purposive sampling of daily adult commuters was done, and responses were recorded via validated questionnaires: Perceived Stress Scale, Satisfaction with Life Scale, Place Attachment Scale, and Pro-Environmental Scale. The relationship between these variables was analyzed using Pearson correlation in SPSS. Perceived stress shows a negative correlation with life satisfaction but does not correlate significantly with pro-environmental behaviors and place attachment, which is inclusive of identity along with dependence. The Place attachment strongly predicts pro-environmental behaviors particularly land stewardship, environmental citizenship and social environmentalism, although the conservation lifestyle shows weak correlation. Life satisfaction correlates positively with pro- environmental behaviors as well as with place attachment. These results demonstrate the significance of place attachment in promoting environmental friendly consciousness and satisfactory life, implying an interconnected set of environmental behaviors. By fostering place attachment in the metro system, eco-friendly activities and well-being can be enhanced which will contribute to SDG 13 (Climate Action), SDG 11 (Sustainable Cities and Communities), and SDG 3 (Good Health and Well-Being). Relaxing ergonomics will not only promote responsible environmental actions but also contentment with life.

Keywords: *Place attachment, commuter stress, life satisfaction, pro-environmental behavior, Delhi Metro*

Since the time of civilization, human beings are bonded by emotional links, “a good enough” environment is what that is needed for attachment to build between individuals and their respective environment.

From the countryside to a metropolitan area, different emotional responses are evoked by human beings to different geographical locations in their actual, implied or imagined presence. Sun et al. (2021) noted that attachments to places arise due to relationship between the

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stimulus-organism-response, the associated ambience cues that influence their social interactions, and the social cues that enhance their hedonic experiences.

Place based attachments are particularly cornerstone by Place dependence as well as Place identity, which brings about a higher life satisfaction (Sagone et al., 2023) and accentuated well-being.

People experience wavering levels of satisfaction depending upon the area, Malvaso and Kang (2022) noted that people assess each area differently which neglects the concept of direct average evaluation of all domains for determining life satisfaction.

The top-down causation behind well-being is based on the subjective interpretation of life's outcomes. Chang et al. (2020) found that engagement in diverse nature types and strong connect to the outer nature significantly enhances life satisfaction.

WHO (2020) in its conference emphasized the endorsement of well-being, where the major priorities covered in the charter were sustainability, well-being, universal ripple of health, harnessing digital transformation with responsibility, and protecting the planet for future generations.

With a step toward creating sustainable cities and communities, one of the major developments is the Metro System which introduces a dynamic and pervasive issue of "stress" that arises from commuting and holds an empirical significance not in the fields of psychology but also social sciences, health sciences, engineering, ergonomics, urban planning and management.

In an Indian study Mohan and Kulkarni (2021) reported stress to be predominately one of the most faced issues by Mumbai Train commuters. Similarly, Morris and Guerra (2015) also found that train to be the enabler of negative emotions, in comparison to all other modes. However, these emotional experiences may be reduced by the aesthetic qualities associated with the commute system that can contribute to well-being and life satisfaction.

Fatni (2024) recommended transforming the outer environmental surroundings as it will improve spatial experience in Metro Stations. Chodor and Doriana (2024) also recommends inclusion of urban green spaces, as it leads to restoration, which otherwise have contributed to be sense of "placeless feeling"

Place attachment is sometimes conflated with "sense of community" as it indicates a sense of social bonds and a lifelong process of socialization (Scannell & Gifford, 2009). The Indian Metro is an interconnected system of communities that can stimulate a cognizance of belonging and interrelatedness to places, through which sustainable actions can be encouraged. Halpenny (2010) found that visitors along with a robust emotional nexus to places are more plausibly to adopt environmentally responsible behaviors, not just at the place of attachment but also at the outer world.

Solanki et al. (2022) noted range of both the cognitive and affective reasons responsible for taking Delhi Metro for travelling, where over three quarters reported Delhi Metro as a comfortable travelling option and where a considerable portion reported choosing it due to environmental concerns.

Basu et al. (2020) stated Place attachment signifies a high direct effect towards nature connectedness, whereas on the contrary Ramkisson et al. (2013) noted place identity which serves as a component pertaining to place attachment exhibits no significant influence pertaining to pro-environmental intentions.

Pro-environmental behavior often brings a noticeable sense of relief and calm after giving, Sollberger et al. (2015) suggested stress to be the causal factor that contributes to frequent recurrent environmental donations.

Research Gap

There is a wide range of studies done on Place Attachment but most of them have focused on natural environments than the artificial man-made settings. The constructs selected for contemporary research are mostly studied individually, but very few studies have integrated these constructs all together in an Urban Transit System.

The Sustainable Development Goals mostly focus on the objective metric side of infrastructure and policy implementation, and there is scant evident empirical investigation based on psychological and subjective experiences. Therefore, comprehensive study is required for bridging these gaps in research.

METHODS

Objectives

- Investigate the association between stress and pro-environmental behavior, among Delhi Metro commuters.
- Examine the association between stress with place attachment toward the metro system.
- Examine the association between stress and life satisfaction with life among Delhi Metro commuters.
- Investigate the association between place attachment and pro-environmental behavior among Delhi Metro commuters.
- Assess the association between place attachment and satisfaction with life among Delhi Metro commuters.

Hypothesis

- Stress among Delhi metro commuters is expected to negatively correlate with place attachment.
- Stress among Delhi metro commuters is expected to have negative correlation with pro- environmental behavior.
- Stress among Delhi metro commuters is expected to negatively associate with life satisfaction.
- Place attachment towards Delhi Metro System is expected to be positively associated with pro-environmental behavior.
- Place attachment towards Delhi Metro System is expected to be positive relationship with life satisfaction.

Sample Distribution

Inclusion Criteria

1. Candidate must daily travel from Delhi Metro

2. Candidate must be above age 18
3. Candidate must give informed consent before participating in the research

Exclusion Criteria

1. Individuals younger than 18 were excluded from participation
2. Individuals who do not travel daily from Delhi Metro were excluded

Sample and Techniques

A sample of regular Delhi Metro Commuters was selected to participate in the study after acquiring their informed consent. The researcher provided a clear explanation about the purpose of the study and addressed all questions raised by the participants. The study adopted purposive sampling with a sample comprising N= 100 participants.

Tools used for the study

- **Perceived Stress Scale** originated by Cohen and Williamson (1988) is an extensively utilized questionnaire that helps measure how stressful someone perceives their life to be. It reflects how unpredictable, uncontrollable, or overwhelming situations feel to them. The scores are arranged in a rating of 0 being the lowest and 40 being the highest. The greater the number, higher the intensity of stress.
- **Satisfaction with Life Scale** designed by Diener et al. (1985), serves the objective to compute overall life satisfaction, often termed as global satisfaction. The Participants in the scale rate their feelings about each statement on a seven-point scale system, for instance rate the statement "The conditions of my life are excellent" where option 1 designates to “strongly disagree” and option 7 designates to “strongly agree.”
- **Place Attachment Scale**, Williams and Vaske (2003) is a psychometric tool that is designed to measure emotional and functional connection of an individual to specific places. The scale comprises of 12 items in total, where top six items and below six items each are dedicated to Place Identity and Place Dependence. The responses of each item are recorded on a 5-point Likert scale, which encompasses from 1 (Strongly Disagree) to 5 (Strongly Agree), where greater scores demonstrate greater attachment to places. The items were adapted according to the suitability of the place, for instance “I identify strongly with the Delhi Metro System”
- **Pro-Environmental Scale** formulated by Larson et al. (2015) measures PEB as intricate construct, which consists of thirteen statements, and is categorized into four key areas. Participants rate each statement on a likert five point scale, where 1 means "never," 3 means "occasionally," and 5 means "very often." including conservation lifestyle behaviors, social environmentalism, environmental citizenship, and land stewardship. Domain scores are computed by averaging responses, with scores of 1–2 indicating low engagement, 3 reflecting moderate engagement, and 4–5 signifying frequent pro-environmental behavior.

Statistical Analysis

An analysis of Pearson correlation analysis was carried out to examine associations among place attachment, stress, and life satisfaction. Extensive statistical tools provided by SPSS facilitated the proper evaluation of the research hypotheses.

Ethical Consideration

1. This study adhered to the guidelines prescribed by American Psychological Association, (2003) in its Ethical Principles of Psychologists and Conduct Code especially the Section 8 dedicated to Research and Publication.
2. All subjects were educated regarding the aim and the confidentiality of the information obtained for the study.
3. Also, voluntary participation was ensured.

RESULT AND DISCUSSION

The study explored the relationship between Place Attachment, Life satisfaction, Stress, and pro-environmental behavior among Delhi Metro Commuters.

Table 1: shows the relationship between Perceived stress, Place attachment (place identity and place dependence), Life Satisfaction and Pro-Environmental Behavior (Environmental citizenship, conservation lifestyle, land stewardship, and Social Environmentalism)

	SE	EC	LS	CL	SWL	PL d	PL i	PS
SE	1	.69**	.77**	.51**	.47**	.45**	.39**	.01
EC		1	.68**	.20*	.40**	.60**	.45**	.08
LS			1	.49**	.25*	.46**	.38**	.15
CL				1	.05	.06	.13	.09
SWL					1	.38**	.34	-.21*
PL d						1	.73**	.08
PL i							1	.17
PS								1

Note: ***** Indicates significant correlation at the 0.01 level (2-tailed).***
**** Indicates significant correlation at the 0.05 level (2-tailed).***

The table shows Perceived stress (PS) exhibits a substantial negative correlation with satisfaction with life (SWL) ($r = -0.21$, $p < 0.05$), indicating people who encounter higher stress levels tend to delineate low level life satisfaction, which supports the hypothesis that high levels of stress negatively impact life satisfaction. This finding lines up with existing literature suggesting that excessive stress among commuters can reduce overall life satisfaction, lower productivity, and contribute to psychological distress (Evans & Wener, 2002).

However, the relationship found between perceived stress and pro-environmental behavior variables was not significant, indicating that environmental engagement may not be directly influenced by stress levels.

Place attachment, encompassing both place identity (PLI) and place dependence (PLD), is significantly associated with pro-environmental constructs. Social Environmentalism demonstrates a moderate, positive correlation with place identity ($r= .39$, $p< .01$) and place dependence ($r= .45$, $p<.01$), which indicates individual who are actively engaged in the environmental stances do not consciously act due to their dependence on the place, but also due to the emotional sense and identity towards the place of attachment.

Land stewardship (LS) demonstrates positive correlations with both place dependence ($r = .46$, $p <0.01$) and place identity ($r = .38$, $p < 0.01$), suggesting that individuals who exhibit a robust connection to a place are more plausible to engage in responsible environmental behaviors.

Furthermore, place identity and place dependence are statistically linked to environmental citizenship (EC) ($r = .45$, $p < 0.01$ and $r = .60$, $p < 0.01$, respectively), emphasizing the role of place attachment in fostering environmental responsibility.

These results support the notion that individuals who feel a strong attachment to a particular space more presumably engage in behaviors aimed at its preservation (Scannell & Gifford, 2009). However, among the sub-domains of pro-environmental behavior conservation lifestyle showed a weak correlation, with place dependence ($r=.13$, $p > 0.5$) and place identity ($r=.09$, $p >0.5$). It can be understood that some behaviors are done due to a pattern of learned actions and routine work, that do not significantly depend upon the extent of how we are attached to a site and the sense of identity that a place gives.

The perceived stress shows a non- significant correlation with place identity ($r= .17$, $p >.05$) and place dependence ($r= .08$, $p >0.5$) suggesting stress cannot erode or enhance the level of one's dependence to the place nor the sense of identity. This indicates that transient interactions within the metro environment minimally subscribe to the burgeoning of place attachment, rendering it an ineffective relationship between the everyday stressors.

Satisfaction with life (SWL) is positively correlated with pro-environmental behavior, particularly social environmentalism (SE) ($r = .47$, $p < 0.01$), environmental citizenship ($r = .40$, $p < 0.01$), and land stewardship ($r = .25$, $p < 0.05$). These findings highlight that individuals who are satisfied with their lives are more likely to engage in environmentally responsible actions.

Life satisfaction in many citizens is seen to be fostered by attachment to places, which recommends that a strong emotional bond to place significantly enhances well-being (Martha et al., 2018). The findings of the study support a strong relationship between life satisfaction and place attachment, where place dependence and Life Satisfaction also shows positive correlation ($r= .38$, $p< .01$) and place identity and Life Satisfaction also shows a positive correlation suggests that a deeper emotional connection to a place contributes to overall satisfaction in the domains of life.

Pro-environmental behavior, as represented by variables such as social environmentalism, environmental citizenship, conservation lifestyle (CL), and land stewardship, is significantly interrelated. Social environmentalism is highly correlated with environmental citizenship ($r =.69$, $p < 0.01$), land stewardship ($r = .77$, $p < 0.01$), and conservation lifestyle ($r = .51$, $p < 0.01$), suggesting that individuals who engage in one form of environmental behavior are inclined to adopt forms of environmental actions. This supports the argument that environmental awareness and consciousness functions as an interconnected framework rather than as fragmented set of behaviors (Steg & Vlek, 2009).

Additionally, place attachment plays a crucial function in environmental engagement, as seen in the strong associations between place dependence, place identity, and pro-environmental behaviors. These findings reinforce the psychological and behavioral benefits of environmental engagement, suggesting that individuals with strong place attachment and environmental responsibility tend to experience greater life satisfaction.

CONCLUSION

This study explored relationship between perceived stress, place attachment, pro-environmental behavior, and life satisfaction among Delhi Metro commuters. The results also revealed higher stress to be in line with lower life satisfaction, while stronger place attachment is linked to greater life satisfaction and more environmentally friendly actions.

In the conclusion, it's about the people who commute, navigating the daily life hassles on the Delhi Metro. The study indicates that people who feel connected to the places we transmit through, like the metro stations, may boost our spirits, ease our stress, and even encourage us to care more for the environment. By considering the aesthetics of metro system designs, the place can contribute to a healthier, happier life where we recharge, connect, and contribute to a sustainable future.

By encouraging sustainability, the study connects to the broader goals, such as the United Nations Sustainable Development Goals. The study supports SDG 3 (Good Health and Well-Being), that emphasizes better lifestyles and emotional fortitude for every individual, by demonstrating that commuters' mental health and life satisfaction are improved by lower stress and stronger place attachment. A metro system is seen as a connecting hub for a wide range of communities, when factors like stress and place attachments are studied in relation to it, the encouraging and discouraging factors for usage can be discovered. This calls for resilient inclusive sustainable spaces that improve life satisfaction, while aligning with SDG 11 (Sustainable Cities and Communities).

By encouraging environmental consciousness, Climate action (SDG 13) perhaps will be promoted which contributes to the diminution of urban pollution and carbon emissions through fostering the use of public transport.

To enhance the metro transit system, future efforts should prioritize creating interiors that foster a sense of place and well-being for commuters. Gathering insights into commuter experiences through qualitative approaches, such as phenomenology, in-depth interviews, and focus groups, can provide rich, meaningful data to inform improvements in human-centered transit design. Urban planners and policymakers must consider well-being and life satisfaction in their strategies, as emotionally resonant environments can boost transit usage and strengthen community cohesion.

REFERENCES

Basu, M., Hashimoto, S., & Dasgupta, R. (2019). The mediating role of place attachment between nature connectedness and human well-being: perspectives from Japan. *Sustainability Science*, *15*(3), 849–862. https://doi.org/10.1007/s11625-019-00765-x

Chang, C., Oh, R. R. Y., Nghiem, T. P. L., Zhang, Y., Tan, C. L., Lin, B. B., Gaston, K. J., Fuller, R. A., & Carrasco, L. R. (2020). Life satisfaction linked to the diversity of nature experiences and nature views from the window. *Landscape and Urban Planning*, *202*, 103874. https://doi.org/10.1016/j.landurbplan.2020.103874

Chodor, D. (2024). Enhancing Well-Being in Transit.: Can airport settings function as restorative and health-promoting in travellers' airport experience? Swedish University of Agricultural Sciences (SLU).

Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan & S. Oskamp (Eds.), *The social psychology of health* (pp. 31–67). Sage.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, *49*(1), 71–75. https://doi.org/10.1207/s15327752jpa4901_13

Evans, G. W., Wener, R. E., & Phillips, D. (2002). The morning rush hour. *Environment and Behavior*, *34*(4), 521–530. https://doi.org/10.1177/00116502034004007

Fatini, M. A. (2014). The Power of Biophilic and Fractal Design at Metro Center, DC: A Sensorial Intervention to Enhance Well-Being Open Access [Master's Thesis]. The George Washington University in Washington, D.C.

Fried, M. (2017). Grieving for a lost home. In *Routledge eBooks* (pp. 229–248). https://doi.org/10.4324/9781315126197-20

Halpenny, E. A. (2010). Pro-Environmental Behaviours and park visitors: the effect of place attachment. *Journal of Environmental Psychology*, *4*(30), 409–421.

Larson, L. R., Stedman, R. C., Cooper, C. B., & Decker, D. J. (2015). Understanding the multi-dimensional structure of pro-environmental behavior. *Journal of Environmental Psychology*, *43*, 112–124. https://doi.org/10.1016/j.jenvp.2015.06.004

Malvaso, A., & Kang, W. (2022). The relationship between areas of life satisfaction, personality, and overall life satisfaction: An integrated account. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.894610

Manzo, L. C. (2003). Beyond house and haven: toward a revisioning of emotional relationships with places. *Journal of Environmental Psychology*, *23*(1), 47–61. https://doi.org/10.1016/s0272-4944(02)00074-9

Manzo, L. C. (2005). For better or worse: Exploring multiple dimensions of place meaning. *Journal of Environmental Psychology*, *25*(1), 67–86. https://doi.org/10.1016/j.jenvp.2005.01.002

Martha, S. R., & Fikri, M. Z. (2020). *Hubungan antara place attachment dengan kepuasan hidup pada warga di Sukawinatan* [The relationship between place attachment and life satisfaction among residents in Sukawinatan]. Repository Universitas Sriwijaya.

Mohan, R., & Kulkarni, M. (2022). Stress and adaptation among Mumbai local train commuters. *Psychological Studies*, *67*(1), 43–52. https://doi.org/10.1007/s12646-022-00639-w

Montoya, A. K., & Marsh, J. K. (2022). *js-psychmed: Mediation analysis in SPSS* [SPSS module]. https://SPSS.org/modules.html

Morris, E. A., & Guerra, E. (2014). Mood and mode: does how we travel affect how we feel? *Transportation*, *42*(1), 25–43. https://doi.org/10.1007/s11116-014-9521-x

Ramkissoon, H. (2020). Perceived social impacts of tourism and quality-of-life: a new conceptual model. *Journal of Sustainable Tourism*, *31*(2), 442–459. https://doi.org/10.1080/09669582.2020.1858091

Sagone, E., Indiana, M., & Sciuto, E. (2023). The Relationships of Attachment Styles with University Students' Life Satisfaction and Place Attachment. *SWS International Scientific Conference on Social Sciences*, *10*, 359–365. https://doi.org/10.35603/sws.iscss.2023/sv05.11

Scannell, L., & Gifford, R. (2009). Defining place attachment: A tripartite organizing framework. *Journal of Environmental Psychology*, *30*(1), 1–10. https://doi.org/10.1016/j.jenvp.2009.09.006

Solanki, S., Meena, S., & Kumar, U. (2022). Development of the Travel Satisfaction Scale (TSS) For the Assessment of Commuters' Satisfaction in Public Transport: Evidence from Delhi Metro (India). *Scientific Journal of Silesian University of Technology Series Transport*, *117*, 233–245. https://doi.org/10.20858/sjsutst.2022.117.16

Sollberger, S., Bernauer, T., & Ehlert, U. (2015). Stress influences environmental donation behavior in men. *Psychoneuroendocrinology*, *63*, 311–319. https://doi.org/10.1016/j.psyneuen.2015.10.017

Steg, L., & Vlek, C. (2008). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, *29*(3), 309–317. https://doi.org/10.1016/j.jenvp.2008.10.004

Sun, J., Chen, P., Ren, L., Shih, E. H., Ma, C., Wang, H., & Ha, N. (2020). Place attachment to pseudo establishments: An application of the stimulus-organism-response paradigm to themed hotels. *Journal of Business Research*, *129*, 484–494. https://doi.org/10.1016/j.jbusres.2020.10.005

Williams, D. R., & Vaske, J. J. (2003). The Measurement of Place attachment: Validity and generalizability of a psychometric approach. *Forest Science*, *49*(6), 830–840. https://doi.org/10.1093/forestscience/49.6.830

World Health Organization. (2020). *Conference on the endorsement of well-being: Five major priorities*. World Health Organization. https://www.who.int/

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Conflict of Interest

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