ISSN E: 3006-1466
ISSN P: 3006-1458
CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
CJSSR

CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW

Vol.04 No.01 (2026)

DARK TRIAD TRAITS AND ENTREPRENEURIAL INTENTIONS AMONG BUSINESS STUDENTS: THE ROLES OF OPPORTUNITY RECOGNITION AND LOCUS OF CONTROL

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Abstract

This study investigates the relationship between Dark Triad personality traits (Machiavellianism, psychopathy, and narcissism) and entrepreneurial intentions among undergraduate business students in Pakistan. Specifically, it replicates and extends the model developed by Le et al. (2022) in a culturally distinct context, addressing a gap in cross-cultural entrepreneurship research: prior tests of this model have been limited to East Asian samples, and its generalizability to South Asian, collectivist-majority environments remains unexamined. Data were collected from 113 BBA students at a leading business institution in Karachi using a cross-sectional survey design supplemented by two focus group sessions. Mediation and moderation analyses were conducted using the PROCESS macro in SPSS. Results indicate that opportunity recognition fully mediates the relationship between each of the three Dark Triad traits and entrepreneurial intentions, extending full mediation where the original study found only partial mediation for narcissism. The moderating role of locus of control on the opportunity recognition-intention link was not supported, suggesting that structural and institutional factors in the Pakistani context may attenuate the effect of personal control orientation. Findings contribute to personality-based entrepreneurship theory, advance understanding of culturally contingent boundary conditions in the Dark Triad-entrepreneurship nexus, and carry practical implications for business schools seeking to cultivate entrepreneurial intention through targeted opportunity recognition interventions.

Keywords: *Dark Triad, entrepreneurial intentions, opportunity recognition, locus of control, theory of planned behavior, Pakistan*

INTRODUCTION

Entrepreneurship plays a vital role in developing economies, and Pakistan represents a particularly instructive case. In 2021, approximately $350 million was raised across 83 new startup deals, representing a 355% surge in funding and a 63% rise in deal volume compared to the prior year.[1] Investor activity has continued, with 23 venture capitalists participating in funding rounds in 2023 alone.[2] Against this backdrop, understanding the psychological antecedents of entrepreneurial intention among business students carries practical relevance.

A growing body of research has examined how personality shapes entrepreneurial aspirations. Researchers have increasingly turned attention to the Dark Triad: a cluster of

[1]Husain, T. (2022, January 24). The Pakistani startup landscape. The Express Tribune. https://tribune.com.pk/story/2350909/the-pakistani-startup-landscape

[2]Hanif, U. (2023, April 14). Startup funding shows signs of revival in Q1 2023. The Express Tribune. https://tribune.com.pk/story/2409471/startup-funding-shows-signs-of-revival-in-q1-2023

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CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
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CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
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subclinical characteristics comprising Machiavellianism, psychopathy, and narcissism. These traits have been linked to risk-taking, opportunity pursuit, and willingness to challenge established norms.[3] Yet direct-effect studies have yielded mixed results: McLarty et al. (2021) found that only psychopathy and Machiavellianism predicted entrepreneurial intentions,[4] while Wu et al. (2019) reported negative effects for narcissism and psychopathy and a positive effect for Machiavellianism.[5] These inconsistencies suggest that the relationship operates through mediating variables, particularly opportunity recognition.

The present study replicates the model developed by Le et al. (2022), which tested opportunity recognition as a mediator and locus of control as a moderator in the Dark Triad-entrepreneurial intentions relationship.[6] Our contribution is twofold. First, this is, to our knowledge, the first test of this model in a South Asian context, addressing a gap in its cross-cultural generalizability. Second, we extend the model by incorporating qualitative data from focus group sessions, which enrich interpretation of the quantitative findings. Le et al.'s (2022) sample was drawn from Vietnamese students; cultural differences in locus of control orientations[7] and in the social desirability of entrepreneurship as a career[8] make replication in Pakistan a non-trivial theoretical exercise.

This paper proceeds as follows. We first review the relevant theoretical and empirical literature. We then describe the research design, present results, and discuss implications and limitations.

LITERATURE REVIEW

The Dark Triad Traits

The Dark Triad refers to three overlapping but distinct subclinical personality traits. Narcissism is characterized by excessive preoccupation with self-importance, a desire for admiration, and a tendency toward entitlement and dominance.[9] Psychopathy involves a lack of

[3]Hmieleski, K. M., & Lerner, D. A. (2016). The dark triad and nascent entrepreneurship: An examination of unproductive versus productive entrepreneurial motives. Journal of Small Business Management, 54(S1), 7–32. https://doi.org/10.1111/jsbm.12296; Cai, W., & Murad, M. (2021). Dark triad personality traits and entrepreneurial intention: A study of entrepreneurship-oriented students. Frontiers in Psychology, 12. https://doi.org/10.3389/fpsyg.2021.647871

[4]McLarty, B. D., Skorodziyevskiy, V., & Mackey, J. D. (2021). The dark triad and entrepreneurial intentions: A social information processing theory perspective. Journal of Small Business Management. https://doi.org/10.1080/00472778.2021.1883042

[5]Wu, W., Wang, H., Zheng, C., & Wu, Y. J. (2019). Effect of narcissism, psychopathy, and Machiavellianism on entrepreneurial intention: The mediating of entrepreneurial self-efficacy. Frontiers in Psychology, 10, 360. https://doi.org/10.3389/fpsyg.2019.00360

[6]Le, T. T. T., Tran, A. K. T., Hoang, G., & Luu, T. T. (2022). Dark triad traits affecting entrepreneurial intentions: The roles of opportunity recognition and locus of control. Journal of Business Venturing Insights, 17, e00310. https://doi.org/10.1016/j.jbvi.2022.e00310

[7]Mueller, S. L., & Thomas, A. S. (2001). Culture and entrepreneurial potential: A nine country study of locus of control and innovativeness. Journal of Business Venturing, 16(1), 51–75. https://doi.org/10.1016/S0883-9026(99)00039-7

[8]Inoue, N. (2013). Cultural influences on locus of control and entrepreneurship. International Journal of Entrepreneurial Behavior and Research, 19(1), 82–100.

[9]Gubik, A. S. (2023). Why narcissists may be successful entrepreneurs: The role of entrepreneurial social identity and overwork. Journal of Business Venturing Insights, 19, e00378. https://doi.org/10.1016/j.jbvi.2023.e00378; Cai, W., & Murad, M. (2021). Ibid.; Wang, J., & Zheng, Y. (2021). The influence of dark triad personality traits on entrepreneurial intention through entrepreneurial self-efficacy. Frontiers in Psychology, 12. https://doi.org/10.3389/fpsyg.2021.658961

ISSN E: 3006-1466
ISSN P: 3006-1458
CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
CJSSR
CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
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empathy, manipulative and antisocial behavior, and indifference to risk.[10] Machiavellianism describes a disposition toward interpersonal manipulation for personal gain, paired with a cynical view of others and a strategic, goal-focused orientation.[11]

Despite their negative social connotations, each trait contains features that may facilitate entrepreneurial behavior. Narcissism has been positively associated with venture performance and competitive achievement.[12] Machiavellianism's goal orientation may drive individuals to pursue entrepreneurship as a pathway to power and financial gain.[13] Psychopathy, while negatively linked to interpersonal relationships, may confer an advantage in tolerating the uncertainty inherent in new venture creation.[14]

Prior empirical work supports a positive, if context-dependent, relationship between Dark Triad traits and entrepreneurial orientation. Cai and Murad (2021) found that individuals scoring high on all three traits were more inclined to pursue entrepreneurial careers, though cultural context moderated these associations.[15] Wang and Zheng (2021) similarly found that Dark Triad traits enhanced entrepreneurial self-efficacy across cultural settings.[16] Sahinidis and Xanthopoulou (2023) concluded that personal attitude is an important predictor of entrepreneurial intention both directly and through the Dark Triad, while calling for further research given inconsistencies across prior studies.[17]

Entrepreneurial Intention and the Theory of Planned Behavior

Entrepreneurial intention (EI) refers to a conscious state of mind directing an individual's motivation toward planning entrepreneurial activity.[18] Linan and Chen (2009) define it as a psychological construct reflecting the individual's internal evaluation and motivation to engage in entrepreneurial behavior.[19] Research consistently positions EI as a potent precursor to actual entrepreneurial activity.[20]

The theory of planned behavior (TPB), developed by Ajzen (1991), provides the dominant theoretical framework for studying entrepreneurial intentions. The TPB holds that behavioral intentions are determined by attitude toward the behavior, subjective norms, and perceived

[10]Gubik (2023); Sahinidis, A., & Xanthopoulou, P. (2023). Dark triad personality traits and entrepreneurial intention: The mediating role of personal attitude. Social Sciences, 12(3), 167. https://doi.org/10.3390/socsci12030167

[11]Hmieleski & Lerner (2016); Cai & Murad (2021).

[12]Gubik (2023); Cai & Murad (2021); Wang & Zheng (2021).

[13]Bergner, S., Auburger, J., & Palec, D. (2021). The why and the how: A nexus on how opportunity, risk and personality affect entrepreneurial intention. Journal of Small Business Management, 61(6), 2656–2689.

[14]Hmieleski & Lerner (2016); Cai & Murad (2021).

[15]Cai & Murad (2021).

[16]Wang & Zheng (2021).

[17]Sahinidis & Xanthopoulou (2023).

[18]Do, B.-R., & Dadvari, A. (2017). The influence of the dark triad on the relationship between entrepreneurial attitude orientation and entrepreneurial intention: A study among students in Taiwan. Asia Pacific Management Review, 22(4), 185–191. https://doi.org/10.1016/j.apmrv.2017.07.011

[19]Linan, F., & Chen, Y.-W. (2009). Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. Entrepreneurship Theory and Practice, 33(3), 593–617. https://doi.org/10.1111/j.1540-6520.2009.00318.x

[20]Obschonka, M., Silbereisen, R. K., & Schmitt-Rodermund, E. (2010). Entrepreneurial intention as developmental outcome. Journal of Vocational Behavior, 77(1), 63–72. https://doi.org/10.1016/j.jvb.2010.01.001

ISSN E: 3006-1466
ISSN P: 3006-1458
CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
CJSSR
CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
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behavioral control.[21] Individuals with Dark Triad traits may experience heightened positive attitudes toward entrepreneurship, reflecting their confidence, ambition, and desire for influence; their willingness to manipulate environments to achieve goals may also translate into stronger perceived behavioral control. A growth mindset has been found to strengthen entrepreneurial aspirations,[22] and entrepreneurship education at the higher level has been found to positively influence opportunity recognition and, in turn, EI.[23]

Opportunity Recognition

Opportunity recognition (OR) is the process by which individuals identify and evaluate potential business opportunities, discovering or constructing patterns from market information.[24] It is fundamentally a cognitive process shaped by existing beliefs, attentiveness, and experiential knowledge.[25] Individuals with strong opportunity recognition skills tend to demonstrate higher entrepreneurial confidence and stronger intentions to start ventures.[26]

Hassan and Bhatt (2020) found that opportunity recognition significantly and positively predicted entrepreneurial intention among business students in India.[27] Song et al. (2017) demonstrated that network-based knowledge acquisition strengthened opportunity recognition, though this relationship was negatively moderated by entrepreneurial orientation.[28]

With respect to personality, narcissists tend to pursue opportunities that enhance their social standing, though their reluctance to accept feedback may limit objective opportunity evaluation.[29] Machiavellians may recognize opportunities strategically, viewing entrepreneurship as a vehicle for personal gain.[30] Psychopathic individuals, drawn to excitement and high-stakes contexts, may demonstrate heightened sensitivity to novel opportunities.[31] Le et al. (2022) reported that all three Dark Triad traits positively predicted opportunity recognition, which in turn strongly predicted EI.[32]

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[21] Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T; Roxas, B., Cayoca-Panizales, R., & de Jesus, R. M. (2008). Entrepreneurial knowledge and its effects on entrepreneurial intentions: Development of a conceptual framework. Asia-Pacific Social Science Review, 8(2), 61–77.

[22] Neck, H. M., Neck, C. P., & Murray, E. L. (2018). Entrepreneurship: The practice and mindset. SAGE Publications.

[23] Manesh, S. M. H., & Rialp-Criado, A. (2019). International entrepreneurs' knowledge, opportunity recognition, and the influence of entrepreneurship education: A case study. Journal of International Entrepreneurship, 17(3), 339–355.

[24] Hassan, A., & Bhatt, P. (2020). Entrepreneurial intention of Indian university students: The role of opportunity recognition and entrepreneurship education. Education and Training, 62(7–8), 843–861. https://doi.org/10.1108/ET-11-2019-0267

[25] Song, G., Min, S., Lee, S., & Seo, Y. (2017). The effects of network reliance on opportunity recognition: A moderated mediation model of knowledge acquisition and entrepreneurial orientation. Technological Forecasting and Social Change, 117, 98–107. https://doi.org/10.1016/j.techfore.2017.01.004

[26] Le et al. (2022).

[27] Hassan & Bhatt (2020).

[28] Song et al. (2017).

[29] Tlapa, D., Limon, J., Garcia-Alcaraz, J., Baez-Lopez, Y., Ahumada-Tello, E., & Maldonado-Maclas, A. A. (2021). Narcissism and entrepreneurship: A systematic review and an agenda for future research. Frontiers in Psychology, 12. https://doi.org/10.3389/fpsyg.2021.657681

[30] Bergner et al. (2021).

[31] Hmieleski, K. M., & Lerner, D. A. (2016). The dark triad and nascent entrepreneurship: An examination of unproductive versus productive entrepreneurial motives. Journal of Small Business Management, 54(S1), 7–32. https://doi.org/10.1111/jsbm.12296

[32] Le et al. (2022).

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ISSN P: 3006-1458
CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
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Locus of Control

Locus of control describes the degree to which individuals believe they control outcomes in their lives. Those with an internal locus attribute outcomes to their own effort and abilities, while those with an external locus attribute results to luck, fate, or other people.[33] The construct has been linked to entrepreneurial intention,[34] motivation,[35] and opportunity recognition.

Individuals with an internal locus of control tend to be proactive and drawn to situations where effort can determine outcomes, including new venture creation.[36] Those with an external locus tend to avoid risky situations and are less likely to believe their actions will produce desired entrepreneurial outcomes.[37] Le et al. (2022) found that internal locus of control amplified the positive effect of opportunity recognition on EI, while external locus diminished it.[38]

Cultural context shapes these dynamics. Mueller and Thomas (2001) found that individualistic cultures foster stronger internal locus of control orientations and higher entrepreneurial values.[39] In Pakistan, where collectivist norms coexist with a rapidly growing startup culture, the moderating role of locus of control on the OR-EI relationship is an open empirical question.[40]

RESEARCH QUESTIONS AND HYPOTHESES

This study seeks to replicate and extend the model developed by Le et al. (2022) in the context of Pakistani undergraduate business students. Three research questions guide the investigation:

1. What is the relationship between Dark Triad personality traits and entrepreneurial intentions among undergraduate business students?
2. Does opportunity recognition mediate the relationship between each of the three Dark Triad traits and entrepreneurial intentions?
3. Does locus of control moderate the relationship between opportunity recognition and entrepreneurial intentions?

Based on prior theory and empirical evidence, the following hypotheses are proposed:

H1: Opportunity recognition mediates the association between Machiavellianism and entrepreneurial intentions.

H2: Opportunity recognition mediates the association between psychopathy and entrepreneurial intentions.

H3: Opportunity recognition mediates the association between narcissism and entrepreneurial intentions.

[33]Mueller & Thomas (2001).
[34]Krueger, N. F. (2017). Entrepreneurial intentions are dead: Long live entrepreneurial intentions. In Revisiting the entrepreneurial mind (pp. 13–34). Springer.
[35]Mueller & Thomas (2001).
[36]Mueller & Thomas (2001).
[37]Ng, T. W. H., Sorensen, K. L., & Eby, L. T. (2006). Locus of control at work: A meta-analysis. Journal of Organizational Behavior, 27(8), 1057–1087. https://doi.org/10.1002/job.416
[38]Le et al. (2022).
[39]Mueller & Thomas (2001).
[40]Inoue (2013).

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ISSN P: 3006-1458
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H4: Internal locus of control positively moderates the association between opportunity recognition and entrepreneurial intentions, such that this association is strengthened when internal locus of control is high.

H5: External locus of control negatively moderates the association between opportunity recognition and entrepreneurial intentions, such that this association is weakened when external locus of control is high.

RESEARCH DESIGN AND METHODOLOGY

Sample and Procedure

A cross-sectional research design was employed, consistent with the original study.[41] Data were collected from 113 BBA students at a leading business institution in Karachi, Pakistan, using convenience sampling. The student population was selected because career choice is a central concern during undergraduate study, and prior work has demonstrated that students provide a relatively homogeneous sample in terms of entrepreneurial experience, facilitating cleaner comparisons.[42]

In addition to the survey, two focus group sessions were conducted with six participants each. The first session involved a general sample of BBA students; the second was composed exclusively of BBA students who had already initiated entrepreneurial ventures. Focus group discussions moved from broad career aspirations toward entrepreneurship and then toward personality traits, using anonymized news headlines about a prominent entrepreneur to introduce the Dark Triad themes without cueing participants to the study's specific focus.

Measures

All survey variables were measured using validated five-point Likert scales adapted from established instruments. Entrepreneurial intentions were assessed using the six-item scale developed by Linan and Chen (2009).[43] Opportunity recognition was measured using a five-item scale from Nicolaou et al. (2009), with item 5 reverse-coded.[44] Internal and external locus of control were each measured using scales from Mueller and Thomas (2001): four items for internal locus and six items for external locus, with one item removed during reliability testing.[45] Dark Triad traits were assessed using the Dirty Dozen scale (Jonason & Webster, 2010),[46] with four items each for Machiavellianism, psychopathy, and narcissism. Control variables included gender, age, year of study, declared major, and household income category.

Reliability and Data Quality

[41]Le et al. (2022).

[42]Nowinski, W., Haddoud, M. Y., Lancaric, D., Egerova, D., & Czegley, C. (2019). The impact of entrepreneurship education on entrepreneurial intentions in Poland and the Czech Republic. Entrepreneurship and Regional Development, 31(5–6), 416–432.

[43]Linan & Chen (2009).

[44]Nicolaou, N., Shane, S., Cherkas, L., & Spector, T. D. (2009). Opportunity recognition and the tendency to be an entrepreneur: A bivariate genetics perspective. Organizational Behavior and Human Decision Processes, 110(2), 108–117. https://doi.org/10.1016/j.obhdp.2009.08.005

[45]Mueller & Thomas (2001).

[46]Jonason, P. K., & Webster, G. D. (2010). The dirty dozen: A concise measure of the dark triad. Psychological Assessment, 22(2), 420–432. https://doi.org/10.1037/a0019265

ISSN E: 3006-1466
ISSN P: 3006-1458
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Cronbach's alpha coefficients were acceptable across all constructs: narcissism (0.765), psychopathy (0.751), Machiavellianism (0.829), entrepreneurial intentions (0.943), opportunity recognition (0.794), internal locus of control (0.701), and external locus of control (0.670, after removal of one poorly performing item). Skewness and kurtosis values for all constructs fell within the -2 to +2 range recommended by George and Mallery (2010), indicating approximate normality.[47]

RESULTS

Sample Characteristics

Of 113 respondents, 52.2% identified as female, 46.9% as male, and 0.9% preferred not to say. The majority (68.1%) were in the 20-22 age bracket. By year of study, 18.6% were first-year, 22.1% second-year, 42.5% third-year, and 16.8% fourth-year students. Finance was the most commonly declared major (38.9%), followed by Marketing (35.4%) and Entrepreneurship (9.7%). When asked about awareness of the institution's entrepreneurship development center, 38.9% indicated full awareness, 47.8% reported partial awareness, and 13.3% were unaware.

Descriptive Statistics and Correlations

Pearson correlation analysis revealed weak, positive, and statistically non-significant associations between each of the three Dark Triad traits and both opportunity recognition and entrepreneurial intentions (all $p > .05$). In contrast, the correlation between opportunity recognition and entrepreneurial intentions was moderate, positive, and statistically significant ($r = .474$, $p < .05$). One-way ANOVA tests showed no significant differences in either opportunity recognition or entrepreneurial intention based on level of awareness of the institution's entrepreneurship development center.

Regression Analysis

Simple linear regression confirmed that none of the three Dark Triad traits individually explained meaningful variance in entrepreneurial intentions: narcissism explained 0.2% ($F = .209$, $p = .649$), psychopathy 0.9% ($F = 1.008$, $p = .318$), and Machiavellianism 0.5% ($F = .528$, $p = .468$). Multiple regression using all three traits together accounted for only 1% of the variance in EI ($F = 0.384$, $p > .05$). Variance inflation factor (VIF) values for all predictors were below 5, indicating no multicollinearity concerns.

An independent samples t-test revealed that males scored significantly higher on psychopathic traits than females ($M = 2.34$, $SD = 0.74$ vs. $M = 1.95$, $SD = 0.84$; $t(112) = -2.619$, $p = .01$), though the effect size was small (eta-squared = .006). Males also reported higher entrepreneurial intentions than females ($M = 3.58$, $SD = 1.09$ vs. $M = 3.18$, $SD = 0.92$; $t(112) = -2.1$, $p = .038$), consistent with prior literature.[48] No significant gender differences were found for narcissism or Machiavellianism.

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[47] George, D., & Mallery, P. (2010). SPSS for Windows step by step: A simple guide and reference (10th ed.). Pearson.

[48] Carter, N. (1997). Entrepreneurial processes and outcomes: The influence of gender. In P. D. Reynolds & S. B. White (Eds.), The entrepreneurial process. Quorum Books.; Thebaud, S. (2010). Gender and entrepreneurship as a career choice: Do self-assessments of ability matter? Social Psychology Quarterly, 73(3), 288–304. https://doi.org/10.1177/0190272510377882; Thrikawala, S. S. (2011). The determinants of entrepreneurial intention among academics in Sri Lanka. Proceedings of the International Conference on Economics and Finance Research. IACSIT Press.

ISSN E: 3006-1466
ISSN P: 3006-1458
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Mediation Analysis: Hypotheses 1-3

Mediation analysis was conducted using the Hayes PROCESS macro (v4.2) in SPSS. For each Dark Triad trait, the direct effect on entrepreneurial intentions was non-significant while the indirect effect via opportunity recognition was statistically significant (p = .000), indicating full mediation in each case.

For narcissism: direct effect coefficient = 0.044, p = .662; indirect effect coefficient = 0.561, SE = .099, 95% CI [.364, .757]. H3 is supported. For psychopathy: direct effect coefficient = 0.078, p = .459; indirect effect coefficient = 0.556, SE = .099, 95% CI [.359, .753]. H2 is supported. For Machiavellianism: direct effect coefficient = -0.004, p = .965; indirect effect coefficient = 0.562, SE = .101, 95% CI [.363, .761]. H1 is supported.

Moderation Analysis: Hypotheses 4 and 5

The moderating role of locus of control on the opportunity recognition-entrepreneurial intentions relationship was tested using PROCESS (model 1). For internal locus of control, the interaction term (OR x ILOC) produced a change in R-squared of .001, which was non-significant (p = .699). For external locus of control, the interaction term (OR x ELOC) produced a change in R-squared of .003, also non-significant (p = .500). Neither H4 nor H5 is supported.

Focus Group Findings

Qualitative data from two focus group sessions enriched interpretation of the survey findings. A consistent theme was the centrality of self-belief as a prerequisite for entrepreneurship. Participants in both groups cited job security and family responsibilities as major barriers. Students already engaged in ventures identified the institution's predominantly corporate-oriented culture as a significant factor shaping peers' career preferences, noting that faculty messaging frequently emphasized employment over new venture creation.

Participants who expressed entrepreneurial aspirations cited parental role models or social media figures as key sources of inspiration, with a recurring desire to avoid monotonous corporate careers. When presented with anonymized news headlines describing a prominent entrepreneur in terms consistent with narcissism and psychopathy, most participants, particularly male ones, interpreted these characteristics as markers of ambition and effectiveness rather than negative attributes. Female participants shared similar interpretations but with greater hesitation, a pattern consistent with the quantitative finding of higher psychopathy scores and entrepreneurial intentions among male respondents.

DISCUSSION

The results support H1, H2, and H3, confirming that opportunity recognition fully mediates the relationship between each of the three Dark Triad traits and entrepreneurial intentions. This finding replicates the core mediation result of Le et al. (2022),[49] extending it to a Pakistani business school context for the first time. Notably, where the original study found only partial mediation for narcissism, full mediation was observed across all three traits in the present sample. This divergence may reflect contextual differences between Vietnamese and Pakistani students,

[49]Le et al. (2022).

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including variation in entrepreneurial education, institutional culture, and the broader startup ecosystem.

On their own, the Dark Triad traits showed weak and non-significant associations with both opportunity recognition and entrepreneurial intentions. This aligns with theoretical arguments that dark personality traits influence entrepreneurship through indirect pathways rather than direct effects. Individual trait characteristics provide some grounding: narcissists' preoccupation with admiration may bias opportunity evaluation toward prestige-enhancing rather than viable ventures;[50] Machiavellians and psychopathic individuals, while driven by power and immediate gain, may find the delayed and uncertain rewards of entrepreneurship less immediately attractive.[51]

The non-significant moderation by locus of control (H4, H5) diverges from the original study's findings. Le et al. (2022) found that internal locus of control strengthened the OR-EI link while external locus weakened it. The absence of this effect is consistent with research showing that locus of control's directional influence varies substantially across cultural contexts.[52] In Pakistan, institutional and familial pressures on career choice, as evidenced by the focus group data, may dampen the moderating influence of personal control orientation. Students who recognize entrepreneurial opportunities may nonetheless be steered away from acting on them due to external social pressures irrespective of their personal locus. Future research should examine whether structural and institutional factors mediate or moderate the locus of control-intention relationship in similar settings.

Gender differences emerged on two fronts. Males scored higher on psychopathic traits and reported stronger entrepreneurial intentions than females. The gender gap in EI is well-documented across the entrepreneurship literature.[5354] The qualitative data suggested that female participants placed a higher premium on financial security prior to pursuing entrepreneurial ventures, reflecting broader economic risk perceptions among women in the Pakistani context.

Awareness of the institution's entrepreneurship development center was not significantly associated with either opportunity recognition or entrepreneurial intentions. Focus group participants noted that center initiatives were poorly marketed and overshadowed by the institution's corporate-job culture, pointing to a gap between the existence of entrepreneurship support infrastructure and its effective communication and uptake.

THEORETICAL AND PRACTICAL IMPLICATIONS

Theoretically, this study makes three contributions. First, it establishes cross-cultural generalizability for the core mediation result of Le et al. (2022): opportunity recognition operates as the necessary cognitive bridge between Dark Triad traits and entrepreneurial intentions in a South Asian, collectivist-dominant context, not just an East Asian one.[55] Second, it extends the original model by demonstrating full, rather than partial, mediation for narcissism, suggesting that contextual factors may tighten the mediation structure. Third, the null finding for locus of control

[50] Tlapa et al. (2021).
[51] Wu et al. (2019).
[52] Inoue (2013); Mueller & Thomas (2001).
[53] Carter (1997); Thebaud (2010); Thrikawala (2011).
[54] Acs, Z., Arenius, P., Hay, M., & Minniti, M. (2005). Global entrepreneurship monitor: 2004 executive report. Babson College and London Business School.
[55] Le et al. (2022).

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moderation contributes to a growing literature on culturally contingent boundary conditions in the personality-entrepreneurship nexus.[56] Together, these findings underscore the importance of institutional and cultural context in modulating the personality-entrepreneurship relationship and call for broader multi-country replication studies.

Practically, the findings carry direct implications for business schools. If opportunity recognition is the pathway through which personality traits translate into entrepreneurial intention, then interventions aimed at strengthening opportunity recognition skills may be productive across diverse personality profiles. This is particularly relevant for institutions that aspire to cultivate entrepreneurial cultures: developing experiential curricula, increasing student exposure to active entrepreneurs as mentors, and improving communication about existing entrepreneurship support services may collectively shift both opportunity recognition and entrepreneurial intention. The finding that a substantial proportion of students remain unaware or only partially aware of institutional entrepreneurship programs is a practical call to action for administrators.

LIMITATIONS AND FUTURE DIRECTIONS

Several limitations should be acknowledged. First, the sample is limited to BBA students at a single institution in Karachi. The original study used 962 participants across multiple disciplines; the present study's smaller, more homogeneous sample of 113 likely reduced statistical power, particularly for detecting the moderating effects of locus of control. Future research should replicate this model with larger, multi-institutional samples spanning different regions of Pakistan and comparable South Asian economies, which would improve both statistical power and generalizability.

Second, the cross-sectional design precludes causal inference. Longitudinal data would allow examination of whether Dark Triad traits and opportunity recognition at one point in time predict actual entrepreneurial activity at a later point.

Third, self-report measures of Dark Triad traits may be affected by social desirability bias, particularly given the negative social perception of these traits. Survey administration via student social media groups may also have introduced response carelessness.

Fourth, from a methodological standpoint, structural equation modeling (SEM) would provide more rigorous simultaneous tests of the mediation and moderation pathways and should be considered in future replications with larger samples.

Future research should also examine whether active utilization of institutional entrepreneurship services, rather than mere awareness, is a stronger predictor of OR and EI,[57] and explore genetic and experiential factors that moderate opportunity recognition. The potential moderating role of faculty mentorship quality and peer norms, identified in the qualitative data, also merits empirical investigation.

CONCLUSION

This study replicated and extended Le et al.'s (2022) model in a Pakistani business school context, finding that opportunity recognition fully mediates the relationship between each of the

[56]Inoue (2013); Mueller & Thomas (2001).

[57]Nicolaou et al. (2009); Tian, H., Iqbal, S., Akhtar, S., Qalati, S. A., Anwar, F., & Khan, M. A. S. (2022). Predictors of entrepreneurial intentions: The role of prior business experience, opportunity recognition, and entrepreneurial education. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.882159

ISSN E: 3006-1466
ISSN P: 3006-1458
CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
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CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
Vol.04 No.01 (2026)

three Dark Triad traits and entrepreneurial intentions. The moderating effects of internal and external locus of control on this mediated relationship were not supported, suggesting that cultural and institutional factors in the Pakistani context shape these dynamics in ways that differ from the original Vietnamese sample. These results advance the cross-cultural generalizability of personality-based entrepreneurship theory, identify opportunity recognition as a robust and culturally stable mechanism, and highlight practical opportunities for institutions to strengthen students' opportunity recognition capacity through targeted programming.

Conflict of Interest Statement: The authors declare no conflict of interest.

Funding: This research received no external funding.

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