

# Construction project manager “dark” personality traits: current research, trends and future themes

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## Abstract

**Purpose** – The personality traits of construction project managers can significantly influence project outcomes. Research has typically focused on the impact of construction project managers’ prosocial personality traits on project outcomes. However, less explored are the impact of malevolent, that is, “dark”, personality traits on project outcomes. A bibliometric analysis is conducted to understand the present state of this research, justifying the need for future exploration in this area.

**Design/methodology/approach** – A bibliometric analysis and visualisation of 36 articles on construction project managers’ dark personality traits (1989–2024) were conducted using data from the SCOPUS database. VOSviewer was used to visualise clusters, networks and trends. A Delphi exercise identified potential future research directions.



**Findings** – This study reveals two research phases: a period of inactivity (1989–2020) and exponential growth (2021–present). Key findings show the *International Journal of Project Management* and *Project Management Journal* as primary sources of relevant published research. The UK leads in research, with Narcissism being the most identified dark personality trait. Most studies used questionnaire surveys. The Delphi exercise suggests four themes (“Dark triad sub-scales”, “Use of self-reports”, “Trait iterations, the Dark triad” and “Big tent” and “Lifecycle variations”) for future research in this field.

**Originality/value** – To the best of the authors’ knowledge, the study is one of the first to conduct a bibliometric analysis of the literature on “dark” personality traits of construction project managers. This study equips construction project managers with a template to facilitate understanding of the literature surrounding these traits.

**Keywords** Behaviour, Bibliometric analysis, Dark personality traits, Construction project manager, Project management

**Paper type** Literature review

## 1. Introduction

The significance of human and social factors in the success of construction projects has been a longstanding focus of academic literature (Ojiako *et al.*, 2016; Shahzad *et al.*, 2023; Xiong *et al.*, 2023). Notably, behaviour is a crucial aspect of these human factors, substantially impacting on the distinction between successful and unsuccessful construction projects (Rudolph *et al.*, 2008). Here, behaviour is described as the “...external changes or activities of living organisms that are functionally mediated by other external phenomena in the present moment” (Uher, 2016, p. 490). Personality is identified as a major behavioural primer (Mischel, 1973). Defined as the “[...] enduring predispositions that characterise a person, such as styles of thought, feelings, and behaviour” (Diener and Lucas, 2019, p. 294), personality consists of “traits”. These are, in effect, “[...] dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings and actions” (McCrae and Costa, 1990, p. 23). Personality traits serve as the stable characteristics that determine how a construction project manager responds to different situational influences (Zell and Lesick, 2022). The academic literature acknowledges the role of personality traits as key indicators of construction project success (Lee and Foo, 2022; Kassa *et al.*, 2024); however, most investigations have focused on traits deemed “prosocial” and likely to enhance favourable behaviours in construction projects.

There is, however, an alternative view of personality traits. This perspective asserts that traits may also be “dark” (Paulhus and Williams, 2002). “Dark” personality traits are associated with antisocial tendencies, aversiveness, deviance and malevolence. A significant number of studies have documented the prevalence of these traits among construction project managers (Gallagher *et al.*, 2015; Ahmad *et al.*, 2022; Khan and Khan, 2022; Khan *et al.*, 2022; Cavazotte *et al.*, 2023; Shahzad *et al.*, 2023; Xiong *et al.*, 2023). Importantly also, these traits have been explored through the framework of three interrelated personality constructs: “Machiavellianism”, “Narcissism” and “Psychopathy” (Paulhus and Williams, 2002). Collectively, these constructs have been studied under an interrelating assemblage known as the “Dark Triad” (Paulhus and Williams, 2002, p. 557).

The current challenge faced by scholars is that while available research appraising related knowledge on the dark triad exists in disciplines such as general management (Smith *et al.*, 2018; Mackey *et al.*, 2021) and entrepreneurship (Brownell *et al.*, 2021), to date, there are no similar studies focused on construction project managers. Thus, the aim of this study is to analytically fill this knowledge gap by providing an overview of relevant research performed on construction project managers between 1989 and 2024 using bibliometric methods. The

objective is to be able to identify the most productive and influential studies, dissemination routes, trends and current evolution of the field. On this basis, the following research questions are presented:

- RQ1. What is the current state of literature on construction project manager “dark” triad personality traits and how can this literature be described in terms of research trends?
- RQ2. What major themes are likely to dominate future research on the “dark: personality traits of construction project managers?”

To address these research questions, the remainder of this paper is organised as follows. Following this introduction, in Section 2, the background literature on dark personality “triad” traits is explored. Literature on the interface between construction projects and dark personality traits is also reviewed. The research methodology is presented in Section 3. The analysis and findings are presented in Section 4 and then discussed in Section 5. A proposed agenda for future research is identified in Section 6. This paper concludes in Section 7.

## 2. Background

### 2.1 *The dark triad of personality traits*

The foundation of research concerning the dark triad can be traced back to [Paulhus and Williams \(2002\)](#). Here, they elucidated the array of three (i.e. “Machiavellianism”, “Narcissism” and “Psychopathy”) malevolent personality characteristics observed in individuals. Their study has been expanded and enriched in later publications as reported in numerous reviews ([Furnham et al., 2013](#); [Muris et al., 2017](#); [Koehn et al., 2019](#); [Miller et al., 2019](#)) and meta-analyses ([Schreiber and Marcus, 2020](#); [Dinić and Jevremov, 2021](#)).

Here, “Machiavellianism” refers to personality characteristics linked to a “[...] manipulative personality” ([Paulhus and Williams, 2002](#), p. 556). “Narcissism” refers to personality characteristics linked to “[...] grandiosity, entitlement, dominance, and superiority” ([Paulhus and Williams, 2002](#), p. 557). “Psychopathy”, on the other hand, is marked by a personality oriented towards “[...] high impulsivity and thrill-seeking along with low empathy and anxiety” ([Paulhus and Williams, 2002](#), p. 557). Essentially, psychopathy entails total indifference to societal norms. Because of its connection to the most extreme acts of malevolence, “Psychopathy” is perceived as the most nefarious element of the dark triad personality traits ([Beaver et al., 2011](#)). A unified conceptualisation of the dark triad suggests a general disposition of an individual to “[...] socially malevolent character with behaviour tendencies toward self-promotion, emotional coldness, duplicity, and aggressiveness” ([Paulhus and Williams, 2002](#), p. 557). However, despite this unified conceptualisation, it must be recognised that, currently, there is no formalised gauge for determining whether a trait is to be deemed “dark” or not ([Book et al., 2015](#); [Moshagen and Auerswald, 2018](#)). Thus, [Marcus and Zeigler-Hill \(2015\)](#) based their determination of a dark trait on its potential consequences.

### 2.2 *Construction projects and dark personality traits*

The impact of construction project manager “dark” personality triad traits on project outcomes has been widely studied ([Gallagher et al., 2015](#); [Ahmad et al., 2022](#); [Khan et al., 2022](#); [Khan and Khan, 2022](#); [Cavazotte et al., 2023](#); [Shahzad et al., 2023](#); [Xiong et al., 2023](#)). The reason driving these studies is because construction projects appear very conducive for the manifestation of malevolent behaviours.

Several established theories help explain why dark personality traits may be particularly prevalent in the construction industry. One example is the *Attraction–Selection–Attrition* theory (Schneider, 1987), which suggests that individuals are drawn to, selected by and retained within organisations or projects whose values and norms align with their own dispositions. Applied to construction projects, this implies that key industry characteristics, such as high-stakes competitive bidding and an amalgam of corrupt, unethical and illegal work practices (Locatelli *et al.*, 2022a, 2022b; Ojiako, 2023), has intensified the inclination of practitioners to engage in “[...] deviant behaviour [...] uncontrollable behaviour [...], unpredictability of organizational and individual behaviour [...], irrationality etc” (Singh and Singh, 2002, p.24) and may attract individuals with elevated dark traits, who thrive in environments that reward risk-taking, strategic manoeuvring and manipulative behaviour.

Another relevant framework is Trait Activation Theory (Tett and Burnett, 2003; Tett *et al.*, 2013), which posits that personality traits are expressed when situational cues trigger trait-relevant behaviours. The construction industry, marked by a facade of “[...] wild confusion, disorder, discontinuity in information flow [...]” (Singh and Singh, 2002; p.24) and adversarial stakeholder interactions, provides precisely such cues, activating dark traits and reinforcing aggressive, exploitative interpersonal strategies. Furthermore, performance pressures, such as meeting project deadlines or securing contracts, may inadvertently legitimise and strengthen these behaviours. Thus, construction project environments act as situational catalysts that not only activate but also perpetuate deviant and malevolent behaviour, amplifying their potential impact on project success.

### 3. Research methodology

The research methodology consists of three stages. For the first stage, a search encompassing the abstract, keywords and title sections is performed without adhering to a specific order on the SCOPUS database engine. Our choice to use the SCOPUS database as the primary source for this study was driven by its recognised breadth and relevance to the construction management disciplines (Osei-Kyei and Chan, 2015; Aramali *et al.*, 2025; Almashhour *et al.*, 2025; Al-Mhdawi *et al.*, 2025; Elseknidy *et al.*, 2025; Mohamed *et al.*, 2025; Ojiako *et al.*, 2025). SCOPUS is widely regarded as one of the most comprehensive academic databases (Borgholthaus *et al.*, 2023), hosting an extensive range of peer-reviewed journals across multiple fields, including management, medicine, science, technology (Fahimnia *et al.*, 2015) and engineering (Singh *et al.*, 2021). Indeed, it is often cited as containing the largest collection of scholarly journals (Osei-Kyei and Chan, 2015), many of which are sourced from leading publishers such as Emerald Insight, Elsevier, ScienceDirect, Taylor and Francis and Wiley (Ballew, 2009).

In comparison to other indexing platforms such as Google Scholar, PubMed and the Web of Science, SCOPUS has been found to deliver superior coverage and citation accuracy (Falagas *et al.*, 2008; Chadegani *et al.*, 2013). Consequently, we were confident that using SCOPUS would yield a robust and comprehensive data set on dark personality traits, thereby strengthening the validity and completeness of our research.

Furthermore, because of the acknowledged superiority of SCOPUS over other databases, numerous prior studies have relied exclusively on it. This includes research in both the construction management domain (Osei-Kyei and Chan, 2015) and the psychology field (Joshi *et al.*, 2024). Notably, several bibliometric analyses focused on dark personality traits in psychology journals have also been conducted solely using SCOPUS (Dinić and Jevremov, 2021; Borgholthaus *et al.*, 2023; Kumar *et al.*, 2023). A search code that encompassed the “dark” triad – that is “Machiavellianism”, “Narcissism” and “Psychopathy” – using the following search code is used:

(TITLE-ABS-KEY ('Antisocial' OR "Aversive" OR 'Delinquent' OR 'Deviant' OR "Malevolent" OR 'Malevolence' OR 'Offensive' OR 'Machiavellianism' OR 'Narcissism' OR 'Psychopathy\*') AND TITLE-ABS-KEY ('construction management OR 'construction manager') AND TITLE-ABS-KEY ('Project \*')) AND (LIMIT-TO (DOCTYPE, 'ar')) AND (LIMIT-TO (LANGUAGE, 'English')) AND (LIMIT-TO (SRCTYPE, 'j')).

The search code was designed to retrieve all documents addressing the “dark” triad in construction project management contexts. The inclusion of OR “Machiavellianism” OR “Narcissism” OR “Psychopathy” as search terms ensured alignment with the theoretical framework underpinning the “dark” triad construct. For relevance and quality (Thomé *et al.*, 2016), the search was also confined to peer-reviewed journal publications in English. The initial search resulted in 127 articles. The earliest article published was in 1989 and the latest in 2024 (inclusive).

For the second stage, a visual screening and evaluation of all 127 articles was carried out. The purpose was to filter out articles that were not pertinent to the study using inclusion and exclusion criteria as shown below:

- *Focus*: Articles that do not address instances of the “dark triad” personality traits (i.e. *Narcissism*, *Machiavellianism* and *Psychopathy*) within construction project environments or among construction project managers and practitioners are excluded because they fall outside the primary focus of this study. The central aim of the review is to explore how socially aversive personality traits manifest, influence behaviour and affect performance within the specific sociotechnical and organisational context of construction projects. Consequently, studies conducted in non-construction settings, such as general management and information systems, are excluded, even if they discuss the “dark triad”. While such studies may offer theoretical insights, they do not adequately capture the unique dynamics, pressures and interpersonal complexities that characterise the construction sector. Construction projects involve temporary, multidisciplinary and high-stakes environments that shape the expression and consequences of personality traits in ways not directly comparable to other industries. Therefore, including studies outside this scope would weaken the contextual integrity and relevance of the review, leading to findings that do not align with the study’s objectives. Only research explicitly situated within construction project contexts or directly involving construction professionals is retained to ensure conceptual and contextual coherence.
- *Scope*: All articles that did not explicitly focus on construction projects (i.e. construction project management, construction manager and projectivity) were excluded based on not fitting the study objectives.
- *Document type*: All articles deemed not to be peer-reviewed were excluded. All conference articles were excluded. All articles not published in English (three), as well as any article for which a full copy could not be retrieved were excluded.

For this exercise, an assessment scale assigning a value of either “0” = “does not focus on ‘dark triad’ at all”; “1” = “somewhat focuses on ‘dark triad’”; or “2” = “explicitly focuses on ‘dark triad’” was used. Articles scoring “0” were immediately excluded, those scoring between “1” and “3” were further discussed, with the process repeated until a consensus was reached regarding their inclusion or exclusion. Articles scoring “4” were immediately included, demonstrating a high consensus on their relevance. This exercise resulted in 36 articles being identified as specifically pertinent to the study. To ensure consistency and reliability in this screening process, an inter-rater reliability protocol was applied. Two

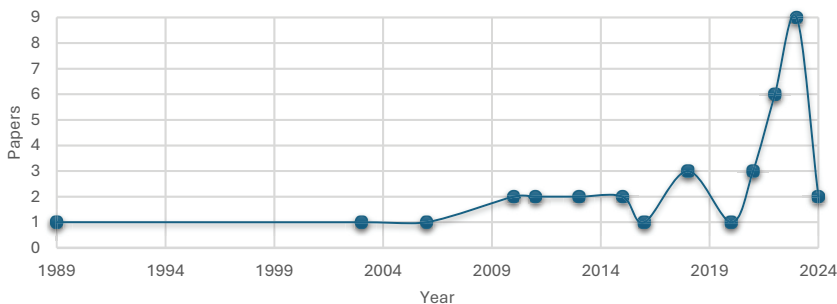
reviewers independently evaluated all 127 retrieved articles using the predefined 0–2 relevance scale. Independent assessments helped prevent bias and allowed each reviewer to apply the criteria without influence. After the initial scoring, all articles with divergent scores were jointly reviewed in a structured reconciliation meeting, during which the reviewers' compared justifications and reached consensus on final inclusion or exclusion decisions. Given the qualitative nature of the screening and the small number of raters, a consensus-based approach was deemed more appropriate than statistical indices such as Cohen's Kappa, which can underestimate reliability in small samples. This protocol strengthened the transparency and rigour of the screening process. For the third (i.e. final) stage of this study, a bibliographic analysis was conducted which essentially, addresses *RQ1*. Although co-citation analysis and thematic mapping are commonly applied in large-scale bibliometric studies, they were not used here because of the relatively small size of the data set. In emerging research domains with fewer publications, co-citation networks tend to be sparse and can result in unstable or weakly connected clusters. Consequently, bibliographic coupling was adopted as the more appropriate structural technique, as it reliably captures intellectual linkages even in fields with low publication density. Combined with keyword co-occurrence analysis, this approach offers a meaningful representation of the field's conceptual and intellectual architecture.

For the third stage and mindful of concerns raised by [Pinto \(2022\)](#) that “research on research” may risk devolving into “navel gazing”, we undertook a process to identify potential future research directions concerning the Dark Triad traits of construction project managers, thereby directly addressing *RQ2*. To achieve this, we conducted a Delphi-type study, a method widely used for agenda-setting in both construction management ([Sourani and Sohail, 2015](#); [Ameyaw et al., 2016](#)) and psychology research ([Norris et al., 2024](#)). A five-step process was adopted, aligning with the methodology of similar, previously reported studies ([Chipulu et al., 2016](#); [Al-Maziouie et al., 2021](#); [Ojiako et al., 2024a, 2024b](#)).

## 4. Findings

### 4.1 Year-wise publication analysis/number of articles published

Typically, an annual review of publication trends is conducted to evaluate the volume of articles published on a specific subject within a defined timeframe ([Abramo and D'Angelo, 2014](#)). [Figure 1](#) illustrates the frequency of annual publications throughout the examined period (1989–2024). Each data point represents the number of publications for a specific year. The analysis reveals a consistent upward trend in annual publications, with a nearly exponential increase starting in 2021.



**Figure 1.** Publication trends from 1989 to July 2024

#### 4.2 Frequently cited articles

The article with the greatest number of citations was determined using the Normalised Number of Citations (NNC) metric. The NNC was calculated by dividing the total citations for each article by the number of years since its publication. This method ensures that older publications, which have had more time to accrue citations, do not gain an unfair advantage over more recent articles. Using the NNC, Flyvbjerg (2021), with an NNC of 19.34, is identified as the most frequently cited article. This was followed by Wang *et al.* (2016) with an NNC of 12.37, and Gällstedt (2003) with an NNC of 8.45. Table 1 ranks the ten articles with the most citations based on their citation counts.

#### 4.3 Dissemination routes

To determine the most cited journals, the same indicators used in the analysis of frequently cited articles were applied. These indicators include Total Papers (TP), Total Citations (TC) and Total Citations per Paper (TCP). The TP measure serves as the primary indicator for dissemination. In the case of a TP tie, the TC measure is used as a tiebreaker.

According to the findings, the *International Journal of Project Management* leads with seven articles, followed by the *Project Management Journal* with six articles. Four papers were published in both *Engineering, Construction and Architectural Management* and the *International Journal of Managing Projects in Business*. These five journals accounted for more than 60% of the selected articles. All these journals are SCOPUS-ranked Q1, except for the *International Journal of Managing Projects in Business*, which is ranked Q2.

#### 4.4 Highest contributing authors, institutions/organisations and countries

The leading researchers, each of whom has published at least two relevant articles, are ranked in order of most contributing author. Mastura Jaafar of Universiti Sains Malaysia (TP = 2; TC = 20) and Shazia Nauman of Riphah International University (TP = 2; TC = 18) ranked first and second, respectively. Jabran Khan of Cardiff Metropolitan University/Bahria University, Namra Mubarak and Samyia Safdar, both of Capital University of Science and Technology, jointly ranked third with a score of TP = 2; TC = 16. Four scholars (Chun Mei Wang, Bing Bing Xu, Su Juan Zhang and Chen Yong Qiang), all from Tianjin University, were ranked joint fourth with TP = 1; TC = 99. The total number of publications (TP) was used as the primary indicator of research productivity and individual author influence. When researchers have the same total number of published works, the ranking is adjusted based on the total citation count (TC) for each article.

In terms of the highest contributing institutions/organisations, contributions were determined by aggregating the affiliations of all authors associated with each article, rather than relying solely on the affiliation of the corresponding or first author. Tianjin University (TP = 3; TC = 144) was found to have made the most significant contribution to research on project-focused “dark” personality triad traits in construction. The University of Copenhagen, with a TP = 2 and TC = 111, was ranked second. The University College London, with a score of TP = 3; TC = 69, ranked third among the highest contributing institutions.

Regarding contributions from countries, the designation “Total papers” (TP) represents the total count of articles published in a research sector within a specific country. TP is critical for showcasing national progress in relevant industrial and policy initiatives. In calculating TP, articles associated with more than one country were not allocated to any single country. The results indicate that the UK was the leading source of research in this domain (TP = 7; TC = 224). Although Pakistan also scored a TP = 7, its lower TC = 75

**Table 1.** Ten most frequently cited papers

Author(s)/Year	Article title	Journal	No. of citations	Normalized no. of citations	Ranking
<a href="#">Wang et al. (2016)</a>	Influence of personality and risk propensity on risk perception of Chinese construction project managers	<i>International Journal of Project Management</i>	99	12.37	2
<a href="#">Gällstedt (2003)</a>	Working conditions in projects: Perceptions of stress and motivation among project team members and project managers	<i>International Journal of Project Management</i>	93	8.45	3
<a href="#">Lindebaum and Fielden (2011)</a>	'It's good to be angry': Enacting anger in construction project management to achieve perceived leader effectiveness	<i>Human Relations</i>	92	7.07	4
<a href="#">Asquin et al. (2010)</a>	When project-based management causes distress at work	<i>International Journal of Project Management</i>	62	4.42	7
<a href="#">Flyvbjerg (2021)</a>	Top ten behavioral biases in project management: an Overview	<i>Project Management Journal</i>	58	19.34	1
<a href="#">Mackey et al. (2013)</a>	Subordinate social adaptability and the consequences of abusive supervision perceptions in Two samples	<i>Leadership Quarterly</i>	54	4.91	6
<a href="#">Skakon et al. (2011)</a>	Do managers experience more stress than employees? Results from the intervention project on absence and well-being (IPAW) study among Danish managers and their employees	<i>Work</i>	54	4.15	9
<a href="#">Pinto and Patanakul (2015)</a>	When narcissism drives project champions: a review and research agenda	<i>International Journal of Project Management</i>	53	5.89	5
<a href="#">Xia et al. (2018)</a>	Cross-domain negative effect of work-family conflict on project citizenship behavior: Study on Chinese project managers	<i>International Journal of Project Management</i>	34	4.25	8
<a href="#">Chiochio et al. (2010)</a>	The project involvement index, psychological distress, and psychological well-being: Comparing workers from projectized and non-projectized organizations	<i>International Journal of Project Management</i>	30	2.14	10

served as the tie-breaker with the UK. China ranked third (TP = 5; TC = 159), and the USA ranked fourth (TP = 4; TC = 118).

4.5 Most common keyword occurrences

Keywords serve to express the central idea and content, as they embody the fundamental concept of the topic being explored (Jin *et al.*, 2018). The assessment of frequently occurring keywords was conducted by examining both keyword occurrences (Oc) and keyword co-occurrences (Co.). The primary standard used to evaluate keyword occurrence is the Oc measure. In cases of a tie in Oc scores, the subsequent ranking is determined using the Co. measure. Table 2 shows that “Project management” ranked first (Oc = 12; Co. = 142). Among the Dark Personality Triad traits, the most frequent keyword was “Narcissism,” followed by “Machiavellianism.” The dark personality trait of “Psychopathy” did not appear as a keyword in any of the studies.

To provide a deeper thematic interpretation of the keyword co-occurrence clusters, the observed patterns indicate several coherent research streams within the domain. The cluster centred on project management, project managers and construction industry reflects the dominant behavioural and organisational orientation of the literature, indicating that dark personality traits are primarily examined in relation to leadership dynamics, project team interactions and project success. A second emerging cluster around terms such as abusive supervision, leadership, emotional exhaustion and conflict management highlights the

**Table 2.** Most frequent author keyword occurrences

R	Keywords	Oc	Co	R	Keywords	Oc	Co
1	Project management	12	142	11	Project champions	1	14
2	Managers	4	44	11	Project governance	1	14
3	Construction industry	3	42	12	Cognitive appraisal	1	13
3	Construction projects	3	42	12	Combined effect	1	13
4	Team members	3	38	12	Conflict management	1	13
5	Psychology	3	35	12	Family structure	1	13
6	Abusive supervision	2	27	12	Fear of failure	1	13
6	Behavioural research	2	27	12	Front-line workers	1	13
6	Construction workers	2	27	12	Humility	1	13
6	Human behaviour	2	27	12	Job alternative	1	13
6	Narcissism	2	27	12	Job insecurity	1	13
7	Project performance	2	25	12	Leadership	1	13
7	Project team	2	25	12	Machiavellianism	1	13
8	Project managers	2	16	12	Performance assessment	1	13
9	Risk management	1	16	12	Project citizenship behaviour	1	13
9	Construction project managers	1	16	12	Project commitment	1	13
9	Employment	1	16	12	Project cost	1	13
9	Human	1	16	12	Project leaders	1	13
9	Mental stress	1	16	12	Project outcomes	1	13
9	Occupational exposure	1	16	13	Communication and collaborations	1	12
9	Personality modelling	1	16	13	Decision making	1	12
10	Leadership team	1	15	13	Personality characteristic	1	12
10	Mega construction project	1	15	14	Commitment	1	11
11	Construction management	1	14	14	Corporate performance	1	11
11	Emotional connections	1	14	15	Fairness	1	10

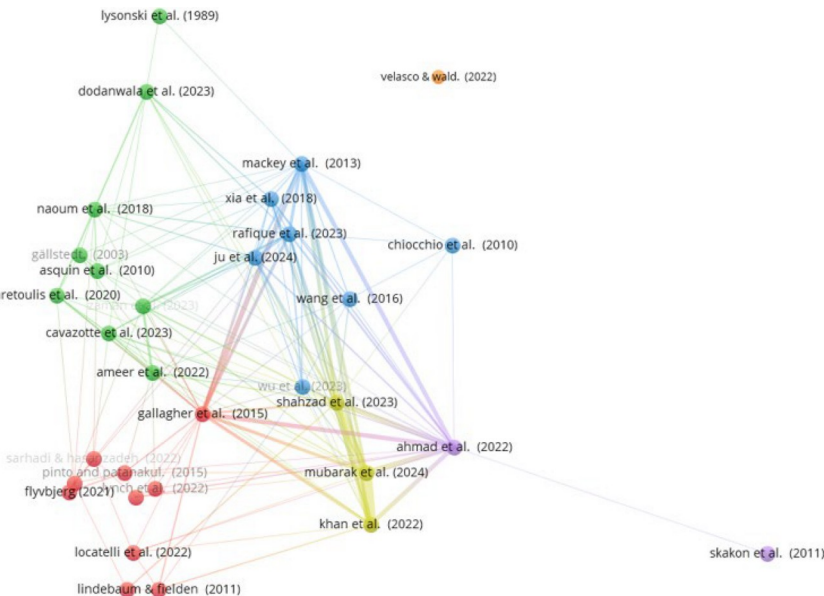
**Note(s):** Abbreviations: R = Rank; Oc = Author keyword occurrences; and Co. = Author keyword co-occurrences links

growing attention to negative interpersonal behaviours within construction project environments. This demonstrates that dark traits are being increasingly linked to harmful supervisory practices and their consequences for worker well-being. A third, smaller cluster involving risk management, project performance and decision making suggests that dark traits may also be analysed through a project systems perspective, where personality-driven behaviours influence risk-taking, governance and performance outcomes. Together, these thematic groupings reveal an evolving research landscape that integrates behavioural psychology with construction management concerns, suggesting that future scholarship is likely to continue expanding across leadership, organisational behaviour and project performance domains.

#### 4.6 Bibliographic coupling

To further elucidate the intellectual structure of the relevant literature, it was important to assess the potential bibliographic coupling among the selected articles. Bibliographic coupling refers to the phenomenon where multiple articles cite the same source (Kessler, 1963; Weinberg, 1974).

In Figure 2, to provide a more nuanced perspective, a visualisation of the bibliographic coupling of the examined articles is presented using graphical outputs generated by the VOSviewer software. Each node in the figure represents a specific article, while the colour coding indicates clusters of articles that are closely associated through their coupling. Different clusters are distinguished by unique colours. The lines connecting the nodes illustrate the strength of the coupling, revealing how frequently articles are cited together, with thicker lines indicating stronger connections.



**Figure 2.** Bibliographic coupling of analysed articles

#### 4.7 Prevalence of methods

This section delves into the prevalent research methodologies used in the selected articles. Research methodologies enhance the reliability and validity of research outcomes (Saunders *et al.*, 2007). A manual content analysis was conducted, focusing on the abstract and methods sections of the 36 identified articles. This process unfolded over two rounds, starting with the creation of a comprehensive list of the articles.

The findings suggest that a significant proportion (67%) of the studies used questionnaire surveys. However, most of these were small-scale surveys with sample sizes of up to approximately 300. When combined with the proportion of interviews (10.8%), surveys accounted for approximately 78% of the research methods used in these studies. The analysis also revealed that literature reviews made up 10.8% of the studies. Conversely, studies categorised as case studies, particularly those relying on textual analysis, constituted only 0.81%. It is important to note that no studies used alternative research methods, such as experiments or mathematical modelling. According to Bendoly *et al.* (2010), these alternative research methods could be relevant in research focused on integrating behavioural theory (Bendoly *et al.*, 2010).

### 5. Discussion

Based on the findings, it has been possible to assess how research on dark personality traits in construction has evolved by analysing existing and relevant literature. The findings are now discussed in a manner that addresses RQ1.

#### 5.1 Year-wise publications

Initially characterised by a remarkably low number of studies, a significant surge in research focusing on construction project managers' dark personality traits began in 2021. This increase can be attributed to several factors, including the inclusion of "Aversive", "Deviant", "Malevolent" and "Malevolence" in our search string, which expanded journal coverage. Furthermore, various sensational reports exposing potential malevolent behaviours in several notable construction projects around that time. Among the most notable were the V.C. Summer nuclear expansion initiative (Ojiako, 2023) and the 2022 FIFA World Cup construction program (Alzoubi *et al.*, 2024). Further fuelled by the rise of "pop psychology" (Lilienfeld *et al.*, 2009; Skryabin, 2021) and a growing interest in social justice, the topic has been further highlighted by the publication of a Special Issue in the *Project Management Journal* focused on the "dark side" of projects (Locatelli *et al.*, 2022a).

Still, we contend that although construction project managers play a crucial role in determining project success (Malach-Pines *et al.*, 2009; Chipulu *et al.*, 2012; Alvarenga *et al.*, 2020), the extent to which "dark" personality traits are examined within the context of construction project management remains relatively limited compared to other managerial roles, such as chief executive officers (Borgholthaus *et al.*, 2023; Wang *et al.*, 2024; Effah *et al.*, 2025). Therefore, there is a need for increased research focusing on the dark personality traits of project managers to enhance understanding of the scholarly dynamics and theoretical development in this area.

#### 5.2 Frequently cited articles, authors and country of origin of studies

According to citation frequency, Flyvbjerg (2021) authored the articles that were cited most often. An intriguing insight derived from examining the ten most frequently cited articles is that most of these works were produced by multiple authors. This finding supports a well-established trend observed in several disciplines, including construction management,

suggesting a progressive decline in single-authored research articles over the past 50 years (El-Adaway *et al.*, 2019).

The findings suggest that the leading publication sources for relevant dark triad research are the *International Journal of Project Management (IJPM)* and the *Project Management Journal (PMJ)*. This may indicate notable interest from practitioners in this area. Both journals benefit from substantial backing by professional organisations. Specifically, the *IJPM* is the premier publication of the International Project Management Association, while the *PMJ* is published by the Project Management Institute.

In terms of the country of origin of studies, it becomes evident that the study of dark personality traits is actively pursued at institutions in the UK, Pakistan, China and the USA. The results concerning Pakistan were surprising. According to Farooq *et al.* (2018), Pakistan holds a relatively minor stake (approximately 0.5%) in the global research publication arena. However, there is a consensus in the literature that the nation's overall research output is on the rise (Ullah and Ameen, 2021).

### 5.3 Prevalence of keywords

The findings show that, in the literature on construction project managers' "dark" personality traits, "Narcissism" was the most frequently featured keyword. This aligns with the existing literature and validates its inclusion in our initial search string. For example, Higgs *et al.* (2023) explain that "Narcissism" has received more than double the scholarly attention over the past 20 years compared to any other dark personality trait.

The most prevalent keyword related to the consequences of dark personalities was "Abusive supervision" (it also appeared as the sixth most common keyword). Abusive supervision is a phenomenon widely acknowledged and experienced by construction practitioners (Ju *et al.*, 2024). The dark triad of "Machiavellianism" (Wisse and Sleebos, 2016), "Narcissism" (Waldman *et al.*, 2018) and "Psychopathy" (Mathieu and Babiak, 2016) has all been found to be correlated with abusive supervision.

Our findings are empirically consistent with your search logic, particularly regarding the relationship between deviant personality traits and abusive supervision (Mackey *et al.*, 2015). Deviant behaviour (i.e. voluntary actions that violate organisational norms and threaten the well-being of the organisation or its members – Robinson and Bennett, 1995) is closely linked to abusive supervision (i.e. sustained hostile verbal and non-verbal behaviours by supervisors toward subordinates – Tepper, 2000). This relationship can be explained through theoretical perspectives such as *social exchange theory* (Cropanzano and Mitchell, 2005), which, in the context of this study, suggests that project team members may reciprocate perceived mistreatment by construction project managers with negative behaviours directed toward other members of the project team.

### 5.4 Overview/taxonomy of methods

The analysis indicates that the research concerning dark triad personality traits in construction project managers is primarily characterised by quantitative, survey-based methodologies. This implies that a significant portion of the current comprehension of dark triad traits within the construction environment relies on the perceptions of participants rather than on actual observed behaviours. Importantly, no studies have used experimental or mathematical modelling techniques, even though these methods could provide more profound behavioural or causal insights. In summary, the results suggest that the existing research on dark triad traits among project managers is methodologically constrained, exhibiting minimal variation in design. This underscores the necessity for future studies to

implement a wider array of diverse, robust and theory-driven methodologies to enhance the understanding of these traits and their impact on project outcomes.

The findings align with a broader trend in construction management research, which has traditionally relied heavily on such methods to gain a deeper understanding of the challenges faced by the industry (Ahiaga-Dagbui and Martek, 2023). This observation is also consistent with literature that identifies surveys as the primary method for evaluating dark personality traits (Smith *et al.*, 2018). However, the widespread use of this approach does not eliminate concerns about its suitability for studying dark personality traits. Surveys tend to assess first-order constructs, and as dark personality traits are better understood as second-order constructs, surveys may not be the most appropriate tool (Miller *et al.*, 2021). Additional concerns regarding surveys, particularly self-report surveys, include their susceptibility to manipulation (Paulhus and John, 1998). Having identified the current state of literature on construction project manager “dark” triad personality traits and how can this literature be described in terms of research trends (i.e. RQ1), we now present the outcomes of the Delphi process through which we will be able to identify the themes likely to dominate future research on the “dark” personality traits of construction project managers (i.e. RQ2).

## 6. Future themes

To address RQ2, we conducted a Delphi exercise replicating a process previously reported in Chipulu *et al.* (2016). The exercise was carried out by a panel consisting of four of the seven co-authors of this paper. All four panel members have significant academic experience in construction and project management, each with approximately 20 years of experience. Three of the panellists have experience as academic editors for Q1/Q2 journals, and one serves as an associate editor of a Q1 journal. The process was facilitated by the first and third co-authors. As the panellists were geographically dispersed, the exercise was conducted online (via Microsoft Teams) and through email correspondence. The following five-step process was adopted:

- (1) Step 1 (“The question”): Panellist were required to show consistent appreciation of construction project manager “dark” personality traits, reflect on insights developed from the bibliometric study which addressed RQ1 and examine earlier cited reviews (Furnham *et al.*, 2013; Muris *et al.*, 2017; Koehn *et al.*, 2019; Miller *et al.*, 2019) and meta-analyses of the dark triad (Schreiber and Marcus, 2020; Dinić and Jevremov, 2021). Following this, they were then asked to consider RQ2 (*What major themes are likely to dominate future research on the “dark” personality traits of construction project managers?*).
- (2) Step 2 (“Initial responses”): Panellist submitted their responses (i.e. proposed themes) to the first and third co-authors alongside with a justification on the importance of the proposed themes (restricted to two sentences) via email.
- (3) Step 3 (“Aggregation and feedback”): The first and third co-authors grouped the various responses together based on theme similarity. This process involved detailing and subsequently organizing the responses into themes and then sharing the anonymised results with the entire panel, inviting further revisions where necessary.
- (4) Step 4 (“Second round of questioning/responses”): Panellist were invited to review the aggregated themes, reconsider their initial responses and make any necessary revisions. Panellists were also encouraged to explain the reasoning behind their agreement or disagreement with the views expressed by others of the Delphi

process were conducted, built on the outcomes of the previous round. Convergence on an agreed research agenda was reached.

- (5) Step 5 (“Validation exercise with each panellist”): Here, panellist was required to confirm: whether the identified themes adequately represent the proposed research agenda on construction project manager “dark” personality traits; whether any theme could have been missed from the exercise; and whether any of the proposed themes could be removed.

As defined by our SCOPUS search code (Section 3), 36 articles published on construction project managers’ dark personality traits between 1989 and 2024 were retrieved. A five-step Delphi exercise was then conducted to reveal four dominant research themes, described below. These are the themes that the researcher construed as potentially dominating future construction project manager “dark” triad personality traits research and, therefore, which addresses RQ2. While delaminated into themes, they may overlap with each other.

### 6.1 *Dark triad sub-scales*

The literature suggests that construction project manager dark traits are multi-dimensional, consisting of different sub-scales. Thus, it is of interest for future studies to use measurement scales capable of capturing the various sub-layers of the construction project managers’ dark triad personality traits. Examples of these sub-scales are especially manifest in measurements focused on “Narcissism”. Literature alludes to two distinct forms of “Narcissism” – *grandiose* narcissism and *vulnerable* narcissism (Zajenkowski and Szymaniak, 2021; Jauk *et al.*, 2022). Examining their manifestation among construction project managers will be of interest.

### 6.2 *Use of self-reports*

Assessing the dark triad has largely relied on self-report measures despite significant concerns regarding their reliability (McDonald, 2008). Self-reports remain the dominant and prevailing method of assessing dark personality traits, primarily because they offer a direct, efficient and standardised means of capturing individuals’ self-perceptions, attitudes and behavioural tendencies. However, observers cannot directly gauge often-concealed traits. Consequently, a dual approach where construction project managers self-report and project subordinates conduct behavioural assessments may represent a viable avenue for future studies (Dinić and Jevremov, 2021).

### 6.3 *Trait iterations, the “dark triad” and “big tent”*

Although the dark traits of *Machiavellianism*, *Narcissism* and *Psychopathy* represent the core of dark personality traits (Paulhus and Williams, 2002), later studies have expanded this to include *Sadism* (Chabrol *et al.*, 2009; Meere and Egan, 2017; Kowalski *et al.*, 2020), forming the “dark tetrad” (Book *et al.*, 2016; Welsh *et al.*, 2024). This literature has developed even further with Marcus and Zeigler-Hill (2015) alluding to a “Big tent” of dark personality traits which includes *Amoralism* (Bandura, 2018), *Dependency* (Hart *et al.*, 2021), *Perfectionism* (González-Hernández *et al.*, 2023), *Greed* (Martin *et al.*, 2024) and *Spitefulness* (Marcus *et al.*, 2014; Zeigler-Hill and Noser, 2018). Future studies could seek to study construction project manager dark traits beyond the dark triad to include a much broader set of “Big tent” dark traits.

### 6.4 *Lifecycle variations*

The conventional view is that personality traits are relatively unchanging, stable and persistent over long periods. Nevertheless, this perspective has been supplanted by literature

advocating personalities as dynamic, shaped by situational contexts (Nubold *et al.*, 2022). Some studies suggest that dark personality traits undergo changes over time (Bleidorn *et al.*, 2022). Coupled with studies highlighting the variability of critical success factors over the lifecycle of construction projects (Ojiako *et al.*, 2024a), a future line of enquiry can be pursued to examine whether and, if so, to what extent, the prevalence of construction project managers' dark trait personalities exhibits variations across different lifecycle stages of construction projects.

## 7. Conclusion

As Paulhus and Williams (2002) introduced the Dark Personality Triad; *Machiavellianism*, *Narcissism* and *Psychopathy*, interest in these traits has grown markedly. Yet, research on dark personalities in construction project management remains limited and fragmented. This study addresses this gap by examining existing knowledge on dark traits among construction project managers and identifying emerging research trends.

A bibliometric analysis of 36 studies was undertaken to reveal patterns, relationships and developmental trajectories. The findings indicate two distinct phases: a prolonged period of minimal activity (1989–2020) followed by sharp growth from 2021 onwards. The *International Journal of Project Management* and the *Project Management Journal* were identified as leading outlets. Narcissism was the most studied trait, and questionnaire-based surveys were the dominant research method. Four themes emerged for future inquiry:

- (1) “Dark triad sub-scales;”
- (2) “Reliance on self-reports;”
- (3) “Trait iterations” (covering both the “dark triad” and broader “dark tent”); and
- (4) “Lifecycle variations”.

To the best of the authors' knowledge, this is the first bibliometric study focused explicitly on dark triad traits among construction project managers; thus, its discipline-specific focus offers deeper insight to the field. It also highlights the growing prominence of the “Abusive supervision” theme, which warrants further exploration. The findings also help scholars identify collaboration opportunities through the mapping of influential authors, journals and bibliographic networks.

Practically, this study raises awareness among construction professionals about the potential prevalence and impact of dark traits and associated behaviours in project managers. The four research themes serve as risk indicators, helping practitioners assess how such traits influence decision-making and project outcomes. More broadly, this study challenges popular “pop psychology” misconceptions about dark personalities often propagated through social media (Jonason *et al.*, 2012; Kavanagh and Cavanna, 2020; Brodie and Ingram, 2021).

Awareness of dark personality traits enables early recognition of behaviours that hinder teamwork and decision-making, ultimately affecting project outcomes. Construction firms can use validated personality assessments during recruitment while acknowledging the limitations of self-report tools. Training that builds emotional intelligence and ethical awareness, alongside transparent governance structures, can reduce manipulation and self-interest. Integrating psychological insight into leadership and project management enhances collaboration, decision quality and project success while mitigating risks of toxic leadership.

Several limitations should be noted, one being the final sample size ( $n = 36$ ). The search code confined the analysis to the dark traits of *Machiavellianism*, *Narcissism* and *Psychopathy*, narrowing interpretive scope. This study also assumes that the construction

environment shapes dark traits, without considering the reverse: how inherent traits may influence culture or trigger deviant behaviour. Although dark traits overlap, each remains conceptually distinct (Hilbig *et al.*, 2021). Prior research shows correlations among the triad traits (Spurk *et al.*, 2016; Rogoza and Ciecuch, 2019; Krizan and Herlache, 2018; Kowalski *et al.*, 2020), but this study did not examine their independent or combined effects. The subjective nature of visual screening and exclusion of conference and non-English publications may also have limited coverage (Pinto, 2022).

A final limitation concerns the Delphi process, which relied solely on the study authors. While ensuring consistency, this may have introduced bias and reduced diversity of perspectives. Future research should engage broader participation from academia, industry and policy-making, supported by multi-round Delphi procedures to strengthen validity and triangulate viewpoints.

In conclusion, this study presents the first bibliometric synthesis of dark triad traits in construction project management. It outlines key trends, influential outlets and future directions, providing both a foundation for academic inquiry and practical insights for the construction sector.

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