Empirical Research Paper

Climbing to the top: Personal life stories on becoming megaproject leaders

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1. Introduction

Leading large-scale megaprojects is a difficult but crucial task (Virtuani et al., 2022). Megaprojects are large capital undertakings in which a high number of public and private organizations collaborate over a long time, that have huge economic, social and ecological impact, with a wide diversity of stakeholders and that contain elements of technological innovation coupled with high risks and complexity (Van Marrewijk et al., 2016). These characteristics have triggered academic attention to the concept of megaproject leader (Carlyle, 1993; Damayanti et al., 2021; Middlemas, 1963; Pisarski et al., 2011; Sankaran, 2018; Virtuani et al., 2022). Megaproject leaders differ from leaders of other project types due to the specific competences needed to match the challenges posed by a megaproject (Müller and Turner, 2010). Damayanti et al. (2021) for example, propose that technical, emotional, social and adaptive competences are needed by megaproject leaders to manage complexity. Programs where leaders are trained in these competences are not easily available around the world, while few companies "have sought to develop and train a cadre of personnel who are particularly skilled and trained in the activities needed to shape a megaproject" (Merrow, 2011: 12). Therefore, Merrow and Nandurdikar (2018) argue that megaproject owners do not have a good track record on the selection and development of leaders. Attention for the development of megaproject leaders is needed, but their development and careers are not well understood (Bredin and Söderlund, 2013).

To better understand the development of megaproject leaders we turn our attention to career theory (Akkermans et al., 2020). Career is here understood as the "evolving sequence of a person's work experiences over time" (Arthur et al., 1989: 8). Bredin and Söderlund (2013) draw attention to formalized career paths for project managers. However, the success of a megaproject leader is not merely due to mentoring programs, but is often the result of events, experiences, and people they meet along the way that shape their thinking and views on managing

megaprojects (Merrow and Nandurdikar, 2018). This career development can also be observed in biographies (e.g. Ashokan, 2015) and autobiographies (e.g. Brewer, 2019; Campbell, 2016) of leaders of megaprojects.

To capture a better understanding of career development of megaproject leaders, we use the biographical research method (Reed-Danahay, 2001; Rosenthal, 2004; Sergeeva and Kortantamer, 2021). Biographical research is here defined as "research undertaken on individual lives and work employing autobiographical documents, interviews or other sources and presenting accounts in various forms" (Roberts, 2002: 33). This type of research focuses on longitudinal continuities in personal experiences, showing moments of choices, crucial events that changed one's life or were otherwise important in the making of moral choices (Rosenthal, 2004). This method has been used earlier to study leaders of megaprojects (f.e. Carlyle, 1993; Merrow and Nandurdikar, 2018; Middlemas, 1963; Sankaran, 2018; Sergeeva and Kortantamer, 2021), but it's full potential has not yet been explored (Sergeeva et al., 2022). The aim of this article is to demonstrate the full potential of biographical research method and contribute to the call for narrative inquiry methods to explore project leadership (Sergeeva et al., 2022).

Based upon the debate above, the central research question in this paper is: *How do leaders of megaprojects express through biographic narratives their becoming of effective leaders?* To capture an in-depth understanding of the issue, we gathered sixteen life histories of megaproject leaders from ten different countries in Europe, North America, Asia and Oceania. Data was collected between the autumn of 2017 and the summer of 2019. Five issues and concerns were identified as important for interviewees in their process of becoming a leader of a megaproject: (1) personal characteristics of leaders; (2) turning points in their lives; (3) value orientations stemming from their family, region or religion; (4) their relationship to the project team; and (5) their professionalization through a diversity of projects. The study contribute to the debate on

narrative inquiry methods by demonstrating the full potential of biographical research method for understanding megaproject leadership, as asked for by others (e.g. Sergeeva et al., 2022). The findings contribute to the debate on megaprojects leaders (Merrow and Nandurdikar, 2018; Sankaran, 2018) with real accounts of how people have become leaders through self-development. Furthermore, the study contributes to the debate on career development of project leaders (Burga et al., 2020; McKevitt et al., 2017) through accounts provided by megaproject leaders, as has called for by scholars (e.g. Akkermans et al., 2020).

The paper is structured as follows. First, we discuss the characteristics of megaprojects and their challenges for leading such projects. We then zoom into career theory to understand that leaders develop themselves in relation to their context during the course of their life. Second, we discuss the biographical research method (Reed-Danahay, 2001) and methods for collecting and analyzing the data. We then present the five issues that were identified as important in the careers of leaders of megaproject, which can help to select and train potential leaders. In the discussion section, we reflect upon the contributions of our findings to the debates on megaprojects and to career development of leaders of megaprojects. We conclude by answering the central research question in this paper and provide suggestions for future research.

2. Theoretical frame

Literature on leadership has been well established in project studies (e.g. Ahmed et al., 2021; Clarke, 2012; Lindgren and Packendorff, 2009). Traditionally, this literature focused on project leaders as agents using rules and rewards to successfully carry out the task of executing a project for a principal or owner within given time and budget (Muller and Turner, 2005). Research moved away from this task orientation towards other approaches. One of these is the trait approach to leadership, which tried to identify specific characteristics and qualities of great leaders (Loufrani-Fedida and Missonier, 2015). For example, Xu et al. (2014) envisage traits as a potential for leadership, which can be developed in the course of a leader's life. The shortcomings with this traits approach triggered the skills approach to identify what skills make a good leader and whether these can be developed (Boerma et al., 2017). An example of the skills approach is the study of leadership development at General Electric when Jack Welch was the CEO (Waters, 2009). Another approach on leadership focused on the behavior of project leaders. The behavioral approach identifies different leadership styles based on how leaders act and suggests which style is effective (Turner and Müller, 2005).

Recently, the visionary and motivational roles of a project leader has emerged in project literature, calling for a more transformational leadership in projects (Northouse, 2021). Transformational leadership creates an engagement that 'raises the level of motivation and morality in both the leader and the follower' (Northouse, 2021: 162). This is especially important when projects become more complex, ambiguous and uncertain as in our study of megaprojects. Therefore, Whyte et al. (2022) propose a new research agenda on project leadership by addressing three salient issues; (a) changing technologies and incorporating innovation in projects, (b) growing organizational complexity and uncertainty within and across projects, and (c) ecological concerns to support societal transition to sustainability. In line with this new research agenda, we are interested in how megaproject leaders do address these salient issues and how they have learned this to do so.

2.1. Challenges for leading megaprojects

The academic attention for the leading of megaprojects has slowly increased in recent decades (Devkar and Sankaran, 2023; Pisarski et al., 2011; Sankaran, 2018; Virtuani et al., 2022). We have identified eight characteristics on megaprojects from literature posing serious and diverse challenges for leading this type of projects. First, megaprojects are characterized by a high degree of complexity, which involves a wide diversity of public and private organizations, stakeholders, and other project actors (Van Marrewijk et al., 2016). Leaders require information from a wide range of stakeholders on political, economic and environmental aspects of a megaproject and deal with actors with possible conflicting interests. Second, megaprojects last for a long time; often it takes more than a decade to conceive, develop and deliver a megaproject (Flyvbjerg et al., 2003). Therefore, leaders are challenged to commit themselves for a long time or/and to absorb a project's history when stepping in. For example, Fred Salvucci, former secretary of transportation and MIT engineer Bill Reynolds were seen as the inspirational leaders of the Big Dig megaproject for a 25-year period (Greiman, 2013). Third, the costs of megaprojects often exceed a billion euros, and their financing is very complex, frequently requiring funding from private consortia and international banks (Flyvbjerg et al., 2003). Leaders have to understand such complex funding structures as well as day-to-day management practices in megaprojects that are shaped by the supply of finance capital and it's costs (Styhre, 2020). Fourth, megaprojects are frequently organized beyond national borders. Leading cross-border megaprojects requires cultural and political sensitivity from project leaders. For example, the Amsterdam metro megaproject has been affected by violent protests, highlighting legitimacy issues perceived by stakeholders (Van den Ende and Van Marrewijk, 2019). Fifth, megaprojects are full of risks and uncertainties as they often require untested technologies and processes (Eitan et al., 2023). Sixth, megaprojects are frequently areas of political controversy and power clashes between public and private project partners (Van Marrewijk et al., 2016). Leaders of megaprojects have to deal with political struggles and public and media scrutiny, and change of priorities imposed by external circumstances. For example, the new Mexican government terminated the work on the new national airport after the national elections (Juarez Cornelio et al., 2021). Seventh, megaprojects involve legal and regulatory issues such as claims, litigation, insurance, taxation, new governmental regulations, all potentially causing havoc in their progress. Eight and final, megaprojects have a large impact on their social, economic and ecological environment (Virtuani et al., 2022). Leaders of such large undertakings have to be aware of possible destructions, including social and bio-geophysical displacements. Megaprojects can pose dangers to people and affect communities, such as the problems caused by the sudden release of mine waste at the Samarco mine in Brazil (Pastran and Mallett, 2020). These eight characteristics posing serious and diverse challenges for leading this type of projects.

The literature on the leadership of megaprojects has traditionally been focused upon men (f.e. Carlyle, 1993; McCullough, 1977; Middlemas, 1963). Those were charismatic or heroic master builders who 'held a premier position in society and drove the vision funding, design, and construction of historic structures and improvements' (Flavell, 2011: 79). Middlemas (1963) for example, presented the life biographies of four British "master builders" – Thomas Brassey, Sir John Aird, Lord Cowdray and Sir John Norton-Griffiths – who were heroes of the 19th century economic growth and driven by the spirit of enterprise to build their infrastructure works around the world. Brassey built railway megaprojects all over the world; Aird led the construction of the Aswan Dam, Cowdray built tunnels, railways and electrified Chile, while Norton-Griffiths led railway and road megaprojects in Africa and South America. Middlemas (1963) concluded that these leaders' personal characters and skills were very different, but they shared an intrinsic sense of motivation and belief in what they were doing, benefitting the civilizing progress. According to Middlemas (1963: 311) their epitaph could have been: "I have built a work to outlast bronze." Such a 'great men' are seen as leaders born or destined by nature to be in their role as leaders at a particular time (Carlyle, 1993). For example, the French engineer Ferdinand de Lesseps, known as 'the great engineer', became world-famous after successfully constructing the Suez Canal in 1869. These stories about great men were not only about their heroic potential and successes, but also about failures, such as when de Lesseps took

charge of building the Panama Canal he failed spectacularly (McCullough, 1977), and while Norton-Griffiths shot himself after the collapse of the Aswan Dam project (Middlemas, 1963).

This 'great man' theory was criticized by scholars, who argued that key traits are not innate and enduring, but had to be envisaged as a potential for leadership, which can be developed in the course of a leader's life (Loufrani-Fedida and Missonier, 2015; Xu et al., 2014). Roth et al. (2016) stress the need for shifting the focus to a more human-centered focus and mentioned key differentiators of future megaproject leaders: strategic mindset, change leadership, communication in all its forms, business acumen, balanced decision-making, and political intelligence. Pisarski et al. (2011: 120) argue that leaders of megaprojects also need to "display adaptive and enabling behaviors to foster adaptive processes, such as opportunity recognition, which requires an interaction of cognitive and affective processes of individual, project, and team leader attributes and behaviors". In line with this, Hoover (2019) mentions five leadership success constituents: (1) building trust and communication, (2) cohesion and collaboration among team members, (3) transparent and authentic leadership, (4) creating nimble and autonomous teams, and (5) educated – experienced ownership. Finally, based upon practitioners reports Devkar and Sankaran (2023) plea for required changes in megaproject leadership: (1) creation of new leadership models to lead complex social solutions, (2) shift in the current form of the centralized project leader to enabling leadership, and (3) development of next generation of leaders by apprenticeship.

2.2. Career theory in project management studies

The careers of project managers have been discussed earlier in project literature (Akkermans et al., 2020; Bredin and Söderlund, 2013; Hölzle, 2010; Lloyd-Walker et al., 2016; Richardson et al., 2015). Hölzle (2010) for example, highlighted the temporary nature of projects, which makes it important for project managers to manage their own careers rather than relying on others. Lloyd-Walker et al. (2016) found high levels of personal agency in project managers' career development and a great need for challenging and complex work experiences. Other studies focused upon the career of young adults in project work, showing that they prefer leadership positions, are concerned with social values, and view project work as essential preparation for a career in organizations (Burga et al., 2020). Typically, the career trajectory of project managers follows a sequential path: the beginning of a career, as a discipline specialist, evolves into the role of supervisor or junior project manager, progression to a project manager role, and later that of a senior project manager or program manager (Richardson et al., 2015). In this trajectory, leadership development programs serve as the continual staging and authorizing of participants in order for them to develop as individual leaders (Meier and Carroll, 2020).

However, the training of leaders by definable and learnable skills and abilities has been criticized as becoming a leader is a process, which cannot be easily managed or trained for (Barker, 2001). One cannot lead a megaproject just on account of having managed many large projects (Flyvbjerg, 2017). Instead, Merrow and Nandurdikar (2018: 224) state that "the individual's own model of learning", which is the careful and systematic learning by a leader, is the most important topic. Leaders who develop their competencies, self-regulatory skills, and reflexivity can generate a wide array of options for new actions and thus further develop themselves (Merrow and Nandurdikar, 2018). A leader requires the development of personal values, and an exploration of social values and moral order that integrates their knowledge, ideas, and experiences (Barker, 2001). In line with this, Klenke (1993) suggests that leaders develop themselves through an increased understanding of the moral obligations of leadership and the acceptance of responsibilities to serve society. Therefore, Hölzle (2010) concludes that project-based organizations need to develop a holistic yet integrated incentive system and career path for their megaproject leaders.

Merrow and Nandurdikar (2018) learned that complex project leaders are engineers by training but generalists by nature, coming to project management by accident rather than design. Leaders that were successful in executing complex projects have their own staffing models and do their core team recruiting by themselves. They do not like to delegate decision making, but do delegate project management work as staffing, people management, and communication are perceived by them as their own work (Devkar and Sankaran, 2023). This resonates with Middlemas (1963) description of how the individual characteristics of 19th-century master builders and their societal context interacted to shape the course of their lives. At every stage of a person's life, leadership is developed due to social experiences (Blokker et al., 2019). Furthermore, leaders may have developed assumptions regarding human nature at an early life stage, which may guide their choices of different leadership styles. Therefore, Sankaran (2018) suggests including the biography of leaders to understand their career development.

To do so, Sergeeva and Kortantamer (2021) conducted life-story interviews with four CEOs from UK construction and infrastructure public organizations and found they all had a deep awareness of their own and others' identities, beliefs and values. This self-awareness includes their childhood, family, and culture, which all are part of their identity formation and evolution of leadership (Xu et al., 2014). Burga et al. (2020) include family environments in the study of early career entrants in project management. Empirical evidence suggests that major events in childhood, adolescence or adulthood caused by factors outside the individual's control (e.g., losing a loved one, or being laid off), are powerful contextual influences on leaders' careers (Blokker et al., 2019). Career development is thus a dynamic process as leaders continuously redefine and strive for a fit between themselves and their careers over the course of time (Akkermans et al., 2020). Schein (1996) uses the concept of career anchor, which is one's self-concept consisting of; (1) self-perceived talents and abilities; (2) basic values; and, most importantly, (3) the evolved sense of motives and needs as they pertain to the career. Career anchors of leaders only evolve as they gain occupational and life experience (Schein, 1996). Barker (2001) states that leaders act and develop within a dynamic social system. Leadership ability and effectiveness emerge from the context of a person's work experiences and these evolve and progress throughout the life span (Xu et al., 2014).

Based upon the discussion above we understand career development of megaproject leaders as a dynamic process developing over time, influenced by personal determinants, behavior and environment.

3. Methods

To capture the personal and subjective nature of megaproject leaders, we used a qualitative research approach (Yanow and Schwartz-Shea, 2006). Such an approach is based on the philosophical stance of interpretivism and its ontology, which "assumes that reality is socially constructed; that is, there is no single, observable reality, rather there are multiple realities, or interpretations of a single event" (Merriam and Tisdell, 2015: 9). Epistemologically, qualitative researchers are interested in how people make sense in organizations and the experiences they have in them (Yanow and Schwartz-Shea, 2006).

3.1. Biographical research method

To collect life stories a biographical method to frame the study as "biographical methods is an umbrella term for an assembly of loosely related, variously titled activities: narrative, life history, oral history, autobiography, biographical interpretive methods, storytelling, auto/biography, ethnography, reminiscence" (Bornat, 2008: 344). The biographical or narrative turn occurred in the late 1970s and '80s during the debate on qualitative research methods. Due to dissatisfaction with positivist methods that reduced "human experience to numerical formulae and abstraction" (Merrill and West, 2018: 766), micro social

theories (re)emerged (Roberts, 2019). Biographical methods, in contrast, "brought subjectivity center stage by foregrounding the meaning which people give to their lives" (Merrill and West, 2018: 766). The emergence of the biographical method in the UK was influenced by Chicago School of Sociology's symbolic interactionism, which portrayed social life using life histories to represent people's resistance to institutions. Biographical research methods were also adopted by feminist researchers to give voice to women in social science research (Merrill and West, 2009). Biographical or life-history research focuses on longitudinal continuities in personal experiences, showing moments of choices, crucial events that changed one's life or were otherwise important in the making of moral choices (Chamberlayne et al., 2004; Rosenthal, 2004). For example, based upon archives, personal letters, wills and recollections of friends and families, Middlemas (1963) draws a portrait of the characters of four leaders of megaprojects, their family background, personal ambitions and the events that influenced their careers.

Biographical research captures a rich image of the respondents by taking them back in time and exploring their roots by focusing upon their life history, family origins, childhood and education, and the influence of significant others in parallel with personal life developments (Reed-Danahay, 2001). Rosenthal (2004) calls these internal narrative questions and suggests that, in the interview, we should also ask external narrative questions, which concern events or actions that respondents relate. One example is the biography of Indian technocrat 'Metroman' Sreedharan (Ashokan, 2015). Another example is the study by Merrow and Nandurdikar (2018), who interviewed seven leaders of megaprojects on their childhood, influential people in their life, education, early career, and progression to key events that aided their leadership trajectory. Life-story interview enables us to explore the ways leaders of megaprojects are anchored by their own deep sense of self: their self-awareness about who they are, what they believe, what their values are, and how they can act upon these beliefs and values (Brannen, 2013).

3.2. Data collection

We were faced with the question: How to go about collecting stories form megaproject leaders across the world? Leaders of megaprojects do not leave much autobiographical records and rarely look for publicity. Therefore, we decided to approach scholars across the world who have been writing about megaprojects, and found that 12 academics were interested in participating in this study. We asked these scholars to identify leaders of megaprojects who were perceived as successful in executing their projects and willing to participate in a biographical interview. This resulted in a list of 16 megaproject leaders. While conducting a review of the use of narrative inquiry as a way to collect stories, the authors found that "the focus of narrative inquiry is not only on individuals' experience but also on the social, cultural and institutional narratives within which individuals' experiences are constituted, shaped, expressed or enacted" (Clandinin and Rosiek, 2019: 42). This helped in formulating the interview guide to cover the life cycle of experience with a megaproject as the context (or institution). The guide included interview questions on: (1) youth, family background, education, and work experiences; (2) description of the megaproject; (3) lessons learned during the leader's career. In this way, between 2017 and 2019, we collected 16 life histories of megaproject leaders from ten different countries in Europe, North America, Asia and Oceania (see Table 1). All the interviews were semi-structured and followed the developed protocol. Interviews lasted approximately 90 to 180 min, and were recorded and subsequently transcribed for analysis. When relevant, the interviewing was done in the native language of the interviewee. By using their native language, interviewees can express themselves more freely and precisely, while the interviewer has a contextual understanding of the leader, thus minimizing the cultural gap between researcher and interviewee (Reed-Danahay, 1997). Other information, such as company information, were collected on an

Table 1
List of interviewees.

#	Gender	Country	Megaproject
1	Female	Germany	Motorway
2	Male	England	Railway
3	Male	England	Digitalization of payment system
4	Male	Netherlands	Motorway and tunnel
5	Male	Switzerland	Tunnel
6	Male	Switzerland	Tunnel
7	Male	Australia	Railway
8	Male	Australia	Railway
9	Male	New-Zealand	Museum
10	Male	Australia	Hydrocracker
11	Male	South Korea	Bridge
12	Male	China	Bridge
13	Male	China	Tunnel
14	Male	India	Metro Railway
15	Male	Canada	Urban Transportation
16	Male	Canada	Hydroelectric dams

as-needed basis and company websites were searched to get a better understanding of their project management practices.

3.3. Data analysis

To ensure rigorous analysis of the field data, a holistic approach to inductive concept development was followed (Gioia et al., 2013). Such interpretative methods for analyzing data is "no less systematic than positivistic-informed research" (Yanow and Schwartz-Shea, 2006: 9). Biographical research tries to understand the "lived experience in a critical way" (Finnegan, 2021: 172) and expects that research needs to have a clear focus on the social context. Therefore, a five-step interpretive method was used for the analysis of the biographical interview data for this article (LeCompte and Schensul, 2013). In the first step, each of the interviewers analyzed their own collected biographical interview data and wrote a chapter in a book on all the biographical life stories (Authors, 2021). In the second step, the four editors, who also authored chapters, individually reread the interviews through a critical reading to identify the main concepts. Criticality of biographical research needs a "recursive movement between interviewee's accounts, ongoing reflection on the research context and questions, and the creative exploration of possible theoretical explanations for what is learnt through this (retroduction)" (Finnegan, 2021: 164). The first-order themes resulting from this close reading and supporting biographical data were then analyzed by the four authors during a group meeting in Oslo, as suggested by Chamberlayne et al. (2004). This meeting highlighted the similarities and differences of the authors' interpretation of the data. In this analysis, we focused on coding the issues that the leaders considered important for their development, to see if the emerging themes suggested concepts that might help us describe and explain the development of megaproject leaders. Through these iterations between the preliminary topics and the biographical interview data (Yanow and Schwartz-Shea, 2006) second-order themes were critically reviewed. Such an analysis, where data are understood within their context, strengthens claims made about actors' interpretations. Disagreements between us were discussed until consensus emerged. In the third step, the authors again went through multiple close readings of the interviews and investigated whether it was possible to distil the emergent second-order themes even further into second-order aggregate dimensions. This resulted in the merging of the themes into five preliminary topics: personal characteristics, turning points, value orientations, project team, and diversity of projects. In the fifth and final step, the topics discovered were written down, using the data from the biographical interviews and this went through a number of reviews by the authors.

4. Empirical findings: five themes on becoming a megaproject leader

Based upon our interviews, five issues have proven to be important for interviewees in the process of becoming a leader of a megaproject: (1) personal characteristics of leaders; (2) turning points and mentors in their lives; (3) value orientations stemming from their family, region or religion; (4) their relationship to the project team; and (5) their professionalization through a diversity of projects. Each of these issues will be discussed below.

4.1. Personal characteristics of leaders

In their interviews, the leaders mentioned a large diversity of personal characteristics needed for successfully managing complex megaprojects. They frequently mentioned honesty, reliability, and trustworthiness as important characteristics. For example, interviewee #5 said that trustworthiness was important to him: "To make them [parliament] believe that we were telling the truth; I was not telling lies and I was not telling stupid things." Furthermore, they reported that a leader has to be respected by their team and work hard. For example, interviewee #6 stated that he had always worked hard: "When I did my master's degree in project management, I did it in three years [studying] in the evening... while I was working during the day, and these were busy jobs with several projects." Leaders reported that they were open to problems of others, and took others' points of view into account before making decisions. For example, interviewee #5 observed: "[It's most important to be fair; of course also hard, but fair. Yes, against all your stakeholders and partners." Finally, interviewees mentioned that sensitiveness and ability to handle pressure were important characteristics for leaders of megaprojects.

Taken together, these comprise a very long, and almost hyperreal list of needed personal characteristics needed in megaproject leaders. However, the interviewees agreed that a leader does not need all these characteristics to be successful in a megaproject. The situational fit of the characteristics of a leader and the megaproject is more important. While the interviewed leaders did share a number of personal characteristics, such as diligence, ambition, intelligence, self-efficacy, problem-solving capacity, and the ability to deal with paradoxes, the specific characteristics of a leader that make them suitable to a particular megaproject is the most important aspect according to the respondents. From the interviews it became clear that megaprojects provide a wide diversity of challenges to their leaders, requiring personal characteristics that fit these challenges. For example, interviewee #3 was equipped with the necessary personal characteristics of destigmatizing a very difficult megaproject, with a history of multiple failures. And interviewee #11 needed sensitiveness to nature as the most important stakeholder in a construction megaproject, which helped to provide regional support of citizens.

This also accounts for the opposite, when a leader is not equipped for the megaproject and experience a steep learning curve.

> "One of the first things I had to do was a presentation to the Council of Ministers. Although I had been head of department and project manager at the time, I was mainly focused on the content. And I thought, well, that's a matter of explaining and that will be enough. But [politics] was a whole different ball game" (interviewee #4).

To maximize the situational fit of a leader and the megaproject, the following characteristics were found useful: transpositional attitude (interviewee #12), cross-cultural experience (interviewee #15), and humor to take the tension out of a situation or spur some level of optimism in difficult situations. Most of all, personal resilience to the challenges of megaprojects was important to leaders.

> "When people ask me what the one thing a project manager should do to improve themselves, I usually say, study Buddhism. If you do

those things, you develop personal resilience. Hopefully you develop some personal humility, which will enable you to survive the variations of fortune. Really big projects all have a moment of crisis" (interviewee #9).

4.2. Turning points and mentors

Almost all interviewed project leaders mentioned important turning points in their lives. Turning points that have influenced their career paths and formed them in their project leadership. A wide range of turning points were reported by interviewees. For example, a visit to a mega waterworks project influenced and boosted the career development of interviewee #4 towards becoming a megaproject leader: "There is where my love for the technology emerged, it was in the middle of the summer, I went with small boots to the construction sites, it was fantastic."

Based upon the data, we distinguish two different types of turning points: returning and changing course. The first type is related to stories of leaders returning to school and/or university, after being expelled. For example, interviewee #15 was expelled from high school but then the math teacher said, "No, no, no, you have to come back here", so he went back. Others did not even have had the chance to go to university. For example, interviewee #12 became a college student just at the beginning of China's process of economic reform and opening up of universities. A very dramatic account was given by interviewee #9:

> "I had an epiphany one day on the waterfront, early in the morning, repairing a cash register in the waterfront pub that was just full of drug dealers and drunken sailors. As a 19-year-old boy, barely shaven. And I literally had an epiphany that this could be my life unless I did something about it. And within about three months, I signed up for an engineering class."

The second type of turning point is a change in the course of life. For example, interviewee #7 told us that life would have been different "if my father had gone off when he was 70 and played bowls; I would have stayed in the business. But he hung around. That saw me out and then eventually he sold the business". For some leaders the change started a new phase in their lives. For example, interviewee #5 learned to collaborate with others: "We were Protestants, and the Catholics had separate classes. And when I was 11 years old, they were putting us together. When I look back, this was maybe a strong influence." This type of momentum could boost the professional life. For example, the international experience of working in an American project where new ideas for improvement were empowered, was a turning point for interviewee #8. Or, more tragically, a divorce of parents or the death of a family member could change the course of life: "My father died when I was 15 years old; I left home early to go to university" (interviewee #16).

Megaproject leaders frequently mentioned mentors playing an important role in the development of their career. Family members were the most frequently mentioned mentors – fathers, uncles, mothers and grandfathers stimulated youngsters to get an education, work hard and strive for their dreams. For example, the mother of interviewee #1 motivated her to get an academic education and be economically independent. And interviewee #3, whose grandfather was a Marxist miner, influenced him to take up jobs nobody else wanted. Some stories are dramatic, such as the oldest sister of interviewee #16, who is 10 years older than him and became head of the family after the death of their father, and "stayed at home until my brother and I almost finished university". A mentor could also be found in the project context as interviewee #13, who had an experienced megaproject leader as an important mentor to help him understand leadership as an act of mindfulness in which he learned to keep in mind the big picture while giving attention to small details. Sometimes it is a combination of family member and project context:

"The most relevant one would be my uncle. He lost his father and was put to work – man's work – at the age of 14. But my uncle went on … and ended up in Sydney. Ended up basically dragging himself up by his bootstraps to become a senior project manager. And he taught me about what you could achieve with hard work. That's his byline of my career" (interviewee #6).

Other mentors were teachers. For example, interviewee #15 had a mathematics teacher as a mentor, influencing his choices in life and supporting his personal development at an early stage of his life. Interviewee #6 recounts; "I had a teacher who gave me a lot of ideas as far as history is concerned, which also taught me how history is important to understand what we are doing today, because a lot of things are the consequence of our past, even in the project". In sum, many of the interviewees recognized and valued the role of their mentors in the development of their careers.

4.3. Value orientations stemming from their family, region or religion

Personal values are important to leaders of megaprojects. For example, interviewee #4 said "they asked me what do you consider to be important in project management? And I answered: three things are important, predictability, efficiency and teamwork". Other leaders emphasized different values: "I have no respect for hierarchy. I have a respect for intelligence, you can't ask me to jump out of the window to be the king of the world; no way!" (interviewee #15). While reflecting upon the sources of these personal values we can distinguish three types. The first are values stemming from a leader's family. Interviewees cherished family values and often were influenced by family values. A shared belief across interviewees is the importance of family and camaraderie. For example, interviewee #16 said: "We travel [together] at least once every two years, my brothers and I, with our children." Almost all speak positively about their family, their childhood and their relationships with parents, even though some of the fathers were absent (interviewees #3, #15, #16) or working far away for a large part of their childhood (interviewees #11, #12). The majority of the interviewees reported that their families valued education, and almost all educated themselves to university level. Furthermore, the families valued hard work. This was the case not only with families in Calvinistic-based cultures, such as interviewees #2, #4, #5 and #6, but also with families of interviewees #12 and #13 in China, and interviewee #11 in South Korea highly.

The personal values of leaders also emerged from regional cultures they grew up in; "Basel [Switzerland] is a very liberal city, so it's very open-minded. We live close to Germany, close to France and so I grew up in a spirit of great openness, in a spirit of liberalism" (interviewee #6). Other leaders too, recognized the sources of their personal values. For example, interviewee #4 stated that the city he grew up in is well-known for the local saying 'no bullshitting, just doing', "for myself, I do make this connection, it has helped me in my role as project manager".

Apart from regional cultures, religious backgrounds have proven to be source of personal values for the leaders. Interviewee #9 was influenced by the religious background of his mother: "Particularly from my mother, [I learned] a clear degree of empathy. She had a strong faith, and was a missionary, she spent a lot of time thinking about other people's situations." Others, such as interviewee #16, served at Mass: "So what you learn in church is how you behave with others, and then what do you need to do to make society work." Another important value is respect for nature. Interviewee #11 called nature the most important stakeholder in the megaproject he led.

Finally, personal values were also developed during the engineering education of the leaders. Many reflected on their engineering education as a journey that taught them to be structured, breaking down large problems into small manageable pieces, but also to work on details without losing the big picture (interviewee #16). But that was only the beginning. From their engineering education they developed into

management, often stemming from a desire to work with people. They typically trained in diverse assignments of increasing responsibility until they were appointed to lead a megaproject.

4.4. Relationship to the project team

Among the interviewees, there is a strong belief in the power of teams as a means to create valuable outcomes in megaprojects. For example, interviewee #14 stated: "The first and the most important stakeholder is your team." We were able to identify four convergent points expressed by the interviewees on the imperative role played by team engagement for project success.

First, interviewees recognized the importance of developing a partnership with teammates and other stakeholders around the project in which employees could feel safe. Interviewee #9 commented: "The only way you're going to do those transformational projects is by harnessing a hundred percent of everyone. And people will not give you a hundred percent when you're whacking them over the head. They'll only do that when they feel safe." It is important that team members feel safe and happy: "The first thing is happiness and then let's see what's going on afterwards. It comes as a result of a really effective workplace, and people want to be winners. They want to be in the team that's recognized as good" (interviewee #8). This is in line with earlier studies showing a positive relationship between project teamwork engagement and task and team performance (Müller et al., 2021).

Second, interviewees believed in the skills and abilities in their team and only to a lesser degree in their own: "If you're not in solidarity with the team, if you just look at your own image, it doesn't work" (interviewee #15). This characteristic is identified in earlier studies to be associated with most senior project managers (Müller and Turner, 2007). Interviewee #5 expressed it in this way: "Everybody has to have the possibility to live his role in this project, to be part of it, to be recognized as an important member of the team. It wasn't only me and nobody else".

Third, a leader can provide the team with a clear vision or project narrative: "Leaders need to keep telling the team that we can do this" (interviewee #9). Some used the metaphor of a boat for the team: "We are a boat crew, we have a direction, we have to go there" (interviewee #15). Providing a metaphor, narrative or vision can be powerful:

> "Not for money, but just because they believed in the vision, they wanted to do a better job. When you have a group of people feeling like that, it's incredibly powerful. And they will basically overcome any challenges that you put in their way. It was so powerful that most people on the project [when it] finished went into deep mourning" (Interviewee #9).

Fourth, interviewees emphasized that participation of team members in the decision-making process is key to project success. It was believed that leaders cannot make all the decisions alone. For example, interviewee #12 stated: "Forming a unified sense of purpose with employees by taking their voices into account, plays an important role in improving staff morale and increasing their satisfaction." Interviewees also stressed that it is not only a matter of being able to participate in decision-making, but they also expect that team members are able to make decisions and take their responsibilities. This calls for the recruitment of team members who have the ability to work in a context that requires accountability. Interviewee #4 wanted to be sure that his team and the partners' team could collaborate: "The partners had to send their team to an external agency for an assessment. My team also went there for an assessment and we asked the agency to reflect upon both assessments." Selection of members who can collaborate in a complex environment and be empowered to actively participate in decision-making and take over responsibilities is thus essential. The importance of teamwork was learned over time.

Many of the interviewees reported on their struggles at primary school and later at university, which contributed to their appreciation of

others in the form of teamwork. A number of interviewees learned about teamwork from early childhood and through team sports. For example, to interviewees #2 and #3, loyalty to their football team was very important. A related belief is that of the importance of long-lasting relationships across time and space. This appears to develop early on, but then continues through life. This was indicated by most of the interviewees mentioning childhood friends with whom they still maintain relationships, even across large geographical distances. They cultivated this early teamwork further in their professional career and managing of projects.

4.5. Professionalization through diversity of projects

Our interviewees did not plan their learning processes, but learned through action, reflecting upon their work practices while doing. In this way, the professionalization of leaders was shaped through their projects. For example, interviewee #14 learned most from the frontline, or 'school of hard knocks', by being in the project close to its execution and solving problems there. The project leaders reported that they reflected upon their work during the execution of the project. Interviewee #16 learned to analyze a situation fast to see whether a problem is going to happen and, if so, to quickly act to solve it. Yanow and Tsoukas (2009) call this 'reflection-in-action'. Frequently, project leaders start with smaller but often tricky projects and grow towards more complex megaprojects. "The youngest who are now working for other projects, for new projects, they gain a lot of experience, they can take that experience to new projects and a lot of things are also trial and error" (interviewee #6). This style of learning is central in civil engineering, a discipline most of our interviewees trained in. Their careers rarely show a standstill, but a steady development, both in education as well as professionally and to take on more challenging roles, up to the point where they are ready to take on roles that nobody else dares to accept, much in the same way as interviewee #3 dared to take the challenge to lead the recovery of a failed megaproject.

The learning did not always take place during successful or extremely large projects, but frequently it was the difficult, problematic, political and sensitive projects that the interviewees learned most from. Several types of projects were mentioned by interviewees to improve their learning curves. For example, interviewee #4 reported a steep learning curve in a politically sensitive road toll project: "I think it is good for technical project managers to be working in a complex political context." Our interviewees noticed that leading a megaproject is an end stage of one's career, in which someone's training, experiences, and ambitions all come together. Only a few exceptions to this were noted, such as interviewee #13 who started managing megaprojects when he was 35 years old.

Interviewees perceived international projects to be excellent learning places. "I had projects everywhere, in all the countries where you don't go on vacation. I worked in many African countries, and in Latin America." (interviewee #15). Others agreed: "You don't go to those areas [tropical countries] if you're not adaptable, but if you're not adaptable, you're learning to be adaptable" (interviewee #16). Differences in regional cultures also taught leaders to become sensitive: "We have very different cultures; it depends a lot on the region. And here [in Basel] we are different from people living in Zurich or living in the south. I have learned a lot about what does it mean to develop projects in different social and culture environment" (interviewee #6). Interviewee #2 states that: "The diversity of companies, opportunities, mentors and role models, and of the work I was responsible for and the people I was leading, have all helped to shape me and had a bearing on where I find myself today."

Overall, some of our interviewees learn by doing and take little or no time for reflecting upon their profession from a distance during or even after the execution of a megaproject. Others had practiced this type of reflection, what Yanow and Tsoukas (2009) call 'reflection-on-action'. For example, through the writing of a Master's thesis (interviewee #8)

or PhD thesis (interviewee #4). Reflection did occur after the projects, for example, through evaluations or during the process of contributing to this paper, which helped and supported some of the leaders to take the time to reflect in hindsight on their respective experiences.

5. Discussion

Our study used a biographical research method to collect 16 personal life histories of megaproject leaders in order to better understand how their careers developed over time. The findings show that the interviewees became effective megaproject leaders through personal characteristics, events, value orientations, project team, and a diversity of projects. Their careers have developed along different paths, self-developed through events and with important mentors. While the interviewed leaders do share a number of personal characteristics, the match of a leader's specific characteristics to a megaproject was reported to be the most important. These findings contribute to three different academic debates: biographical research in project management, leaders of megaprojects, and career development in projects. These will be discussed below.

5.1. Using biographical interview methods in project management studies

Our findings contribute to the debate on narrative inquiry methods by unleashing the full potential of the biographical research method to explore project leadership (Sergeeva et al., 2022). In line with other scholars (Merrow and Nandurdikar, 2018; Reed-Danahay, 2001; Sergeeva and Kortantamer, 2021), our study shows that biographical research captures the interviewees' personal determinants, their behavior, and environment forming their careers. We recognize biographical research as a useful approach to investigate leadership, offering more "processual, holistic insights that capture a more nuanced, dynamic, and realistic view of how leaders develop and change" (Pina e Cunha et al., 2017: 373). We also see broader use of biographic research as a range of major research programs are now combining longitudinal and biographical research methods, and mix quantitative data and qualitative interviewing data (King and Roberts, 2014). An example of this is the large-scale project undertaken by the University of Leeds, which conducted seven research studies using a variety of creative methods (Holland, 2011).

However, we see four core biases researchers need to be cautious about when using biographical methods as these can influence the validity of the findings (Pina e Cunha et al., 2017). The first is the inaccurately recalling of events by interviewees, as reconstruction one's life history is subjective and prone to memory shortfall. To (partly) overcome this bias, all interviewers used a structured interview method in this study, helping the interviewee to identify what is significant and meaningful to them about their past, careers, and work. The second bias is social desirability, which is the portraying of oneself in socially positive ways. This has been partly mitigated by specifically asking interviewees for lessons learned from failures and difficult situations during their career. Thirdly, there is a tendency of interviewees to overestimate or exaggerate one's influence over external events. We tried to mitigate this bias by particularly reflecting upon how their life history has fueled their approaches to leading megaprojects. The fourth and final bias is the confirmation of interviewees to an expected profile as life stories told to researchers are shaped by the researchers' interests and questions, by interviewees as they take these and their own interests into account, and by the research encounter itself (Brannen, 2013). We tried to mitigate this by emphasizing we were not looking for best ways, but rather for failures and events that formed the leader during his life. We should not forget that biographical research is a kaleidoscopic approach and not focused upon generalization of findings (Reed-Danahay, 2001).

Another bias that influenced the quality of the study is the ability of interviewees to be reflexive. Although, in general, project managers are

not very experienced in reflecting upon their personal management styles, we expect leaders of complex megaprojects to be able to reflect upon their own lives. This assumption is strengthened by the reflective books (f.e. Ashokan, 2015; Brewer, 2019; Campbell, 2016) and academic papers (Ruijter et al., 2020) on megaproject leaders. This view is supported by other scholars (e.g. Carlsen and Pitsis, 2020; Shamir et al., 2005), who consider that a leader's life story provides the leader with a self-concept from which he or she can lead, and that telling their biography is an important leadership behavior.

Biographical methods confront the researcher also with ethical concerns (Pina e Cunha et al., 2017). Ethical issues that arise include embellishment of life stories; difficulties in distinguishing between analysis and empathy, and instead of focusing on the research purpose, being sidetracked by interviewees' recollections of traumatic experiences, deceased family members or dark periods in their lives. For example, being asked about the influence of his mother, interviewee #7 told us: "I've often been asked about my father, but I don't think I've ever, ever, ever been asked, 'Did your mother have a formative impact on you?' She would have been pleased." Interviewee #7 now appreciates his mother's influence on his career. We think an upfront explanation of the interview protocol in which the interviewee makes a deliberate decision to participate in a life history interview is necessary. One of the questions included in the interview guide raised concerns as the Australian scholars felt that asking about religious background and beliefs was uncommon in Australia. However, this did not seem to be an issue while collecting the stories. Finally, Shamir et al. (2005) point out that the stories could be interpreted in different ways, using an alternative lens to those used by the researcher. The researcher could also try to amplify or reinforce the researchers' preconceived ideas or assumptions. Since there is no 'control group', Shamir et al. (2005) suggest that one way to justify the findings is to collect biographical stories of non-leaders. In our study this could have been done by interviewing the followers or stakeholders. Only in one of the stories both the project owner and project manager were interviewed (interviewee #7 and #8). Overall, we found using narratives a very interesting way to understand megaproject leaders as persons.

5.2. Contribution to literature on leaders of megaproject

The findings contribute to the academic debate on leaders of megaprojects (Carlyle, 1993; Damayanti et al., 2021; Devkar and Sankaran, 2023; Middlemas, 1963; Pisarski et al., 2011; Sankaran, 2018; Virtuani et al., 2022), with personal accounts of how interviewees have become leaders of megaprojects. Such research contributes to the growing attention for a human-centered focus on managing megaprojects (Authors, 2021; Sankaran, 2018; Virtuani et al., 2022). In line with earlier research (Merrow and Nandurdikar, 2018; Middlemas, 1963), interviewees mentioned broad experiences needed for leading megaprojects. However, the matching of a leader's specific characteristics to a megaproject was reported to be the most important feature for project success.

Although they executed the world's largest megaprojects, we have seen little evidence that they perceived themselves as supermen or superwomen, born or destined to be leaders (Carlyle, 1993). An exception is maybe interviewee #11, whose grandfather already dreamed of the megaproject he was leading. Other leaders are dropouts from school, who have developed themselves over time. The relationship of the leader to the project team is especially important, as all the interviewees acknowledged that they cannot know everything and are dependent on their team for support. This points towards a leader as 'situational champion' rather than a superman or superwoman.

Finally, the findings indicate that social value orientations from family, region, or school play an important role in the professionalization of leaders of megaprojects. Interviewees were not always aware of these influences, but leaders need to know their strengths and weaknesses when being selected for a megaproject. Schein (1996) states it is

important to become aware of our career anchors so that we can choose wisely when choices have to be made. Therefore, reflection upon one's own biography can be helpful in answering questions of what values have influenced your professional career, what were the important events in your life, and how do these still influence your leadership style? Carlsen and Pitsis (2020) call this the development of narrative capital, which is "the appropriating of some desirable time-bound experiences into individual and organizational life stories, either as projects passed, or those orienting what people hope for when living life forward" (Carlsen and Pitsis (2020): 358). Leaders who better understand the role of their biography in appropriating narrative capital can be valuable for client organizations. Organizations have a role in facilitating such introspection and learning and in selecting leaders on their competences that fit the needs of the megaproject.

5.3. Development of megaproject leaders through shaping their lives

The findings contribute to career theory in project management studies (Akkermans et al., 2020; Bredin and Söderlund, 2013; Hölzle, 2010; Lloyd-Walker et al., 2016; McKevitt et al., 2017; Richardson et al., 2015) on how careers of leaders of megaprojects develop. The findings show how the interviewees learned to deal with the challenges of leading a megaproject through a lifetime of interaction between their personal characteristics and social value orientations, behavior in teams and professionalization, and events and mentors in their environment. Other scholars (Merrow and Nandurdikar, 2018) have shown that being a careful and systematic learner is an very important characteristic to identify a potential leader. The personal characteristics and social value orientations determine the level of self-efficacy of megaproject leaders, that is, the person's self-belief in being able to fulfill the task. Value orientations stemming from an individual's family, but also regional and national values have played an important role in becoming a leader. This is in line with studies of Xu et al. (2014) and of Burga et al. (2020) that suggest including family, nation and culture in the study of project management careers. The characteristics and values influenced the behavior of leaders, whose execution is influenced by experiences gained from applying similar behavior in the past, and the consequences thereof. Hence, sensemaking and personal determinants determine behavior, and with it the relationship with the team and the ways to professionalize the work at hand.

In line with other studies (e.g. Akkermans et al., 2020), we found that one becomes a leader through one's lifetime experiences. Interviewees mentioned childhood, school, and project experiences, especially difficult projects, in which they experienced steep learning curves as helping them to lead a megaproject. The diversity of projects they worked on also enabled leaders in their career development. Conditional or personal events enact the personal determinants into a specific behavior. As suggested by Blokker et al. (2019), major events in leaders' childhood and adolescence were reported as having influenced their becoming megaproject leaders. These included the divorce of parents or the death of a family member. Careers were also influenced by important mentors, such as family members, teachers or experienced leaders. The contextual influences on a leader's development during a life span is especially interesting to the career theory debate in project management studies. This confirms the interest in the sustainable career perspective which, like our study, captures not only individual agency but also contextual influences and life span perspectives (Akkermans et al., 2020; Van der Heijden and De Vos, 2015). Van der Heijden and De Vos (2015: 7) define sustainable careers as "sequences of career experiences reflected through a variety of patterns of continuity over time, thereby crossing several social spaces, characterized by individual agency, herewith providing meaning to the individual". We agree with Akkermans et al. (2020) who state that this perspective would lend itself well to analyzing the dynamic career paths that project managers typically experience.

6. Conclusions

The study focused upon the central research question of how do leaders of megaprojects express through biographic narratives their becoming of effective leaders? We used the biographical research method to answer this question (Bornat, 2008; Chamberlayne et al., 2004; Merrill and West, 2009; Reed-Danahay, 2001). We gathered 16 life histories of megaproject managers from ten countries in Europe, North America, Asia and Oceania and analyzed five issues important to the interviewees in their becoming a megaproject leader: (1) personal characteristics; (2) turning points in their lives; (3) value orientations stemming from their family, region or religion; (4) their relationship to the project team; and (5) their professionalization through a diversity of projects. The findings presented in this paper contribute to the research agenda on project leadership of Whyte et al. (2022) by showing how megaproject leaders do address innovations, organizational complexity, uncertainty and ecological concerns and how they have learned this to do so. The findings are starting points to study megaproject leaders' careers. We think that the sustainable career perspective (Akkermans et al., 2020) can be useful to study leaders' career development in leading megaprojects. We invite more researchers to undertake narrative-based approaches to study megaprojects leaders. Future research could study the client's selection of megaproject leaders; how are project requirements and leaders matched?

Some practical applications of the importance of career development of megaproject leaders can be found in the Major Projects Leadership Academy at Saïd Business School at the University of Oxford, UK, and the Leading Complex Projects program conducted by Queensland University of Technology in Australia. The biographical interview method has proved to be helpful to leaders to reflect upon their family values, childhood, mentors, and important life events. Leaders who better understand the role of their biography in appropriating narrative capital can be valuable for client organizations. For example, the Dutch training program for megaproject leaders, called *Neerlands Diep,* has adopted a biographical storytelling program to stimulate leaders to obtain insights into their own biographies. We think such insights can help megaproject leaders to grow.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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