

Commercial Airline Pilots' Stress across the Travel Cycle: Multi-level Stressors, Spillover Effects, and the Role of Resources

Abstract

Commercial airline pilots (CAPs) are a key employee group within the travel industry who are exposed to multi-level institutional and organizational demands that impact their lived experience of stress potentially leading to accidents and incidents. This study explores CAPs' lived experience of stress and draws on conservation of resources theory and context and travel stage frameworks to investigate unique stressors that CAPs face at different travel stages. Utilizing qualitative data from interviews with 28 CAPs combined with archival data, we surface a range of multi-level factors that impact their lived experience of stress at each travel stage. To cope with stressors, and in the absence of valuable contextual resources, CAPs utilized multiple personal resources. We additionally found evidence of significant spillover across the travel stages. Findings highlight the need to improve contextual resources available to pilots, strengthen their personal resources, and customize support to the requirements of the travel stage.

Keywords: Commercial airline pilots, conservation of resources, context, document analysis, stress, travel stages

Introduction

The travel industry comprises many different categories of employees. One very significant under-researched group is commercial airline pilots (CAPs), defined as individuals who fly airlines on both short- and long-haul journeys (Valenta, 2018). CAPs are central to the travel industry (Kim et al., 2024; Zhang et al., 2024) and they are exposed to a unique set of multi-level stressors that derive from the wider institutional features of the airline industry, characteristics of airline organizations, and day-to-day stressors such as at take-off and landing, adverse weather conditions, and hazards during the flight (Cahill et al., 2020; David-Cooper, 2016). These wider industry characteristics and specific travel-stage stressors are compounded by having to assume responsibility for the safety of passengers and crew and work irregular shift patterns, leading to social isolation and work–life balance issues (e.g., Cahill et al., 2021; Cullen et al., 2021; Kim et al., 2024; Zhang et al., 2017). It is therefore unsurprising that numerous reports point to high levels of stress among CAPs (Cahill et al., 2020; Deng, 2013) including mental health issues (Pasha & Stokes, 2018), diminished work performance and errors (Zhang et al., 2017), and burnout (David-Cooper, 2016). This was most starkly manifest in the 2015 Germanwings 9525 accident in which all 144 passengers and six crew perished. The accident was categorized as a murder–suicide linked to the co-pilot experiencing depression (cf. Pasha & Stokes, 2018; Soubrier, 2016).

While recent literature on CAP stress is growing (Cahill et al., 2021; Cullen et al., 2021; Kim et al., 2024), there are still several significant gaps. The first gap concerns two streams of literature. The first stream focuses on the work that CAPs undertake, which is characterized as an ‘high reliability’ context (Roberts, 1990, p. 160) consisting of ‘ultra-safe macro-technical systems’ (Amalberti, 2001, p. 110), and their work can be described as a form of extreme work (Garavan et al., 2024). CAPs must deal with situations that Abeyratne (2008, p. 45) describes as ‘unique human factors issue[s]’, including emergency situations and negative manifestations of passenger stress such as alcohol consumption and aggression. The second stream of literature sheds light on the institutional and industry context within which CAPs operate, and spotlights potential macro and meso level factors that influence CAPs’ lived experience of stress. These include significant commercial pressures and financially driven minimalistic and low-cost work practices (Maxwell & Grant, 2018), new forms of employment relations and the decline of trade unions (Moen, 2017), the national institutional environment in which airlines operate and its implications for firm level practices (Becker-Ritterspach et al., 2019), the

changing nature of CAPs' work (Fraher, 2019) and the role of institutional norms (Santin & Kelly, 2017). This literature provides important insights as to 'how' and 'why' CAPs experience stress.

The second gap is a methodological one and concerns an absence of qualitative research investigating the lived experiences of CAPs. Quantitative studies primarily take a static approach and investigate factors such as shift work, work schedule irregularities, sedentary work, flight safety and control, and outcomes related to sleep disruption and fatigue (e.g., Cahill et al., 2021; Fraher, 2004). To illustrate, Zhang et al. (2024) investigated the roles of trait mindfulness, psychological adaptation, and emotional exhaustion amongst pilots, and Kim et al. (2024) investigated the impacts of CAP stress on quality of life. These studies, while useful, provide few insights into the dynamics of CAP stress factors across the travel stages, their perceptions of macro and meso factors, and the role of resources. Qualitative investigations can capture CAP work dynamics (Corin & Bjork, 2016; Creswell & Plano Clark, 2017) and potentially develop new insights into 'how' and 'why' questions.

In this study we utilize a conservation of resources (COR) lens (Hobfoll, 1989, 2011) and insights from theory on context and travel stages to research CAP stress. We address three questions: (1) What do CAPs perceive as the key macro, meso and micro-level factors impacting stress across different travel stages? (2) What are the spillover effects from resource losses across these travel stages and its implications for CAP stress? (3) What roles do contextual and personal resources play at each travel stage in coping with stress?

Consistent with Bliese et al. (2017) we distinguish between stressors, perceived stress, strain, and stress reduction strategies. Our focus is on the perceived stress that CAPs experience in their daily work. In addition, we ground our research within travel stages. Clawson and Knetsch (1966) proposed a five-stage travel framework and recent work by Fennell (2017) investigates fear of travel from the perspective of the traveler. Zhang et al. (2021) investigated travel stress across the travels stages and their framework is used in this study. We use theory on context (Johns, 2006) to provide insights into the multi-level factors that impact the lived experience of stress by CAPs, and we use the COR theory to conceptualize the role of different resources across the travel stages (Lee et al., 2018). COR prioritizes resource loss, which underpins our investigation, and Westman et al. (2004) have posited the centrality of resource loss in the stress process.

We advance existing theory and research on stress in the context of travel, and particularly CAPs, in several ways. First, we utilize context theory, a travel-stage approach, and COR theory to develop a conceptual framework highlighting three travel stages (pre, during, and post) and multiple level contextual factors that correspond to Johns' (2006) notions of omnibus and discrete contexts that can lead to CAPs' perceived stress. Our approach allows for a nuanced and differentiated, rather than aggregated, approach to surface the drivers of stress at different levels and their manifestation across the travel cycle. We therefore build on Fennell (2017) and Zhang et al. (2021) who utilized the travel stages model to investigate, respectively, traveler fear and stress. Second, our study advances a novel perspective to CAPs' experience of stress by focusing on its dynamic and temporal nature. Our conceptual framework is notably distinct in that we investigate unique perceived stressors and resource responses at each stage of the travel cycle and the potential for cumulative, or spillover, effects arising from resource losses across the travel stages (Reiche et al., 2021). Third, we provide insights into the important roles that omnibus and discrete context play at each travel stage and that lead to resource loss and perceived stress, and corresponding resource use. In doing so, we add precision to COR-informed predictions by surfacing different dimensions of context and categories of personal resources in helping CAPs to address stressors.

Theoretical Background

Conceptualizing stress

Fennell (2017) notes the often confusing and interchangeable language used to describe related terms including anxiety, worry, panic, shock, fear and risk, and stress. Here we conceptualize stress as a process whereby the environment and external stressors result in a subjective interpretation of stress by an individual, and these interpretations lead to strain reactions (Bliese et al., 2017; Jamal, 1990). We focus on subjective interpretations of stress, or CAPs' perceptions of their lived experience of stress, across the different travel stages. We use Lazarus and Folkman's (1984, 1987) transactional model of stress, which emphasizes process dimensions whereby both person- and environment-based variables trigger in individuals a cognitive stress appraisal. Therefore, CAP stress is at the level of a primary stress appraisal, and stress occurs when they perceive that the environment, actions of organizations, or events during the flights are harmful. Consistent with COR, the

transactional model of stress highlights a secondary stress appraisal which involves an assessment by CAPs of the available resources to generate a coping response. Coping consists of the efforts of CAPs to manage stressful situations. The use of the transactional model of stress is also consistent with arguments that CAPs operate within a complex multi-level environment across the travel stages, suggesting that they will have to draw on different personal and contextual resources to address their stress (McCarthy et al., 2019). Stress outcomes include emotional upset, psychological distress, or physical symptoms (Hobfoll, 1989).

Conservation of resources theory

COR theory posits that people will ‘strive to obtain, retain, foster and protect those things that they centrally value’ (Hobfoll et al., 2018, p. 16) and that they will seek to acquire and conserve resources (Halbesleben et al., 2014). Central to COR theory is the idea that people with greater resources are better able to cope with resource loss, resist resource depletion, and invest existing resources for future benefits. It emphasizes the primacy of *resource loss* and *resource investment* with the former more harmful, and, as a result, people will try harder to avoid losses (Hobfoll, 2001). Resource investment, in contrast, emphasizes willingness to invest resources to avoid resource loss, recover from losses, and acquire resources. The theory also emphasizes internal and external environmental circumstances that threaten or cause a reduction in individuals’ resources (Lundman et al., 2010). Although the depletion of resources is stressful, individuals may draw upon personal and contextual resources to compensate for the loss and prevent or minimize the stress that they experience (Hobfoll, 1989). We theorize that resource loss/gain will vary across the travel stages resulting in cross-stage fluctuations in resource loss and stress levels.

Halbesleben et al. (2014) propose that resources consist of anything that people can use to overcome stress. They point to four types of resources: *personal*, which include demographics and personality dimensions; *conditions*, which include contextual factors, life statuses, and roles; *objects*, which refer to tangible factors; and *energies*, which focus on effort, motivation, and time resources. Scholars have since adapted this categorization and, for instance, isolated social resources from conditions and differentiated between physical and psychological resources (van Woerkom et al., 2016). As depicted in Figure 1, in the context of our study of CAPs, and informed by Zhang et al. (2021), our focus is on ‘changeable’ resources across each travel stage.

Hence, we opted to include the following categorizations: *physical and energy* resources, which include health, vitality, fatigue, and boredom; *affective and cognitive* resources, which include pilot selection, experience, and competence; *dispositional* resources, which are important to the allocation of other resources and include *self-oriented* (self-efficacy, confidence, responsibility, attitude, and resilience) and *social-oriented* resources (e.g., trust and empathy). We also include *contextual and relational* resources in our framework, including social relationships, for example, with flight crew and ground handling staff—and other contextual resources in the form of human resource (HR) support.

[Insert Figure 1 here]

The multi-level context of CAP stress

Johns (2006) proposed the notion of both omnibus and discrete contexts to conceptualize context.

Omnibus or macro context. Consistent with Garavan et al. (2024), this omnibus context includes the wider airline industry within which CAPs operate. Numerous dimensions of potentially negative omnibus or macro level context are highlighted when it comes to CAPs' lived experience of stress, and which have an impact across the three travel stages of our framework. These include attempts to introduce atypical employment arrangements, redefining working conditions and driving wages down, market liberalization and internationalization of the airline sector (Harvey & Turnbull, 2012), difference between legacy carriers and new entrants (Bamber et al., 2009), significant changes to the nature of CAP work (Fraher, 2019), and legislative and regulatory changes (CAA, 2015). While several of these are beyond the scope of this study, they have led to significant firm level changes impacting CAPs' day-to-day work and working conditions (Becker-Ritterspach, 2019).

Some of these are manifest in factors such as the *cost of training and personal debt*. Most aspiring CAPs can expect to self-fund more than GBP100,000 for their training (Maxwell & Grant, 2018). In addition, most licensed CAPs gain their required 'type-rating' for flying not by earning a salary but by paying an airline to fly as a qualified crew member (ECA, 2016). This places significant strain—likely resulting in resource losses—on newly qualified CAPs to gain secure employment to repay substantial debts.

The changing institutional and industry context also impacts at the firm level in terms of individual *industry commercial and financial pressures*. CAPs operate in a dynamic industry resulting from competition intensity and the expansion of low-cost carriers (Bamber et al., 2009; Fraher, 2019; Sarker et al., 2012). Fenwick and Tausig (1994) highlight legislative and governance frameworks, volatility, and competitiveness. These factors require significant resource consumption prior to a flight, and the resource loss can trigger a resource conservation pattern prior to departure and accordingly lead to high stress levels. These commercial pressures have translated into more flight hours, quicker turnaround times, and shortened minimum rest periods. Indeed, Fanjoy et al. (2010, p. 19) coined the term ‘pilot pushing’ to characterize, as implicit pressure by air operator management, having as many flights in as many sectors as possible with less receptivity to poor weather conditions, resulting in high(er) levels of pilot fatigue in the cockpit or technical issues with aircraft. These commercial pressures are likely to result in resource depletion prior to the flight and continue through the travel cycle, leading to spillover from one stage to another.

Changing industrial and institutional arrangements including the role of trade unions has also led to *atypical or precarious employment and HR practices*. While regarded as being highly skilled, CAPs are not exempt from precarious contracts (ECA, 2019; Jorens et al., 2015; Maxwell & Grant, 2018). Across Europe, more than one in five CAPs are employed on atypical contracts; thus, not directly employed by the airline (ECA, 2019). Resultant job insecurity has negatively impacted loyalty and job satisfaction (Han et al., 2023; Morrison, 2020) and commercial pressures have resulted in the dilution of ‘high road’ or high commitment HR practices, leading to low-cost and minimalistic HR practices (Harvey & Turnbull, 2011). The now widespread adoption of low-cost models impacts directly on the employment experiences of pilots (Lange et al., 2015; Maxwell & Grant, 2018) resulting in increased workplace tensions (Harvey & Turnbull, 2011). The COVID-19 pandemic has led to airlines having to make critical (usually cost-cutting) HR decisions to remain viable and competitive (Rivera-Prieto et al., 2022). These dimensions of context are likely to permeate the full span of the travel cycle.

A fourth wider institutionally driven factor that impacts the lived experience of CAPs is *EASA flight time limitations (FTL)*. In 2016, changes to FTL were introduced to harmonize FTLs across Europe. While this reduced the upper limit of CAPs’ annual flying time in many European countries from 1300 to 1000, the result

for UK-based pilots was an increase in the upper limit of flying times from 900 to 1000 flying hours per year (CAA, 2015). Concerns among CAPs centered on work pressure and the potential for CAPs to experience increased sleep deprivation and fatigue, key sources of resource loss and depletion, which span the three phases of travel (Efthymiou et al., 2021).

Discrete or meso context. Johns (2006) conceptualizes a discrete context to focus on situational variables that influence behavior of employees including their experience of stress, and he gave particular emphasis to task, social and physical factors, with Oc (2018) extending this to include temporal factors. Task dimensions of discrete context are particularly prevalent in the literature including *work context and job characteristics* that CAPs encounter day-to-day. CAPs perform what Karasek (1979, p. 288) describes as ‘high strain jobs’ in that they take personal responsibility for multiple lives and safety (Fraher, 2004; Maxwell & Grant, 2018). This occurs in an unfavorable physical environment involving confinement within the flight deck for extended periods of time (Runeson-Broberg et al., 2014) and with variable air quality and noise (Boyd & Bain, 2008). In the case of short-haul flights, CAPs are subjected to restricted rest periods, long and irregular shifts, and multiple sectors (Vejvoda et al., 2014; Venus & grosse Holtforth, 2022). For long-haul flights, these work characteristics impact circadian rhythms due to inconsistent shift patterns, frequent night flights, and changing time zones (Bendak & Rashid 2020). CAP fatigue, a major situational factor (Jackson & Earl, 2006; Steptoe & Bostock, 2011), is also exacerbated by occurrences of boredom, which Pekrun et al. (2010, p. 531) highlights as a ‘neglected emotion’. CAPs, thus, experience significant resource loss during the flight stage, which spills over to the post-flight stage and potentially the next pre-flight. In addition, automation and ‘fly by wire’ technologies (Oliver et al., 2017, p. 732) have deskilled the pilot role to one concerned with monitoring systems while the autopilot is flying the aircraft. CAPs are also exposed during the flight to passenger stress, excessive alcohol consumption, and aggression. These work characteristics, therefore, exacerbate the extent of resource loss.

We also see evidence of physical aspects of discrete context such as *cultural and geographical distance, and airport issues*. Culture, geography, and airport differences can lead to resource loss and stress, particularly during the flight and post-flight phases. These manifest where CAPs are required to travel to culturally more

distant or remote destinations, deal with different cultural and language issues in Air Traffic Control, experience significant airport congestion, and find slots to land the aircraft and leave on time. Increases in distance to travel elevate stress levels (Bendak & Rashid, 2020; Venus & grosse Holtforth, 2021) and consume significant physical and cognitive resources.

An important example of a social dimension of discreet context concerns *work–life balance issues*. CAPs experience substantial challenges in balancing work with non-work (Williamson & Friswell, 2017). Those who have many short-haul flights are more likely to experience family and work–life balance issues (Bandeira et al., 2018) and multi-sector flying is more resource depleting (Sloan & Cooper, 1986). Work–life balance issues also require significant pre-flight preparation, resulting in the use of physical and energy resources (Cullen et al., 2021). This component may also be in play post-flight due to insufficient restoration of resources during the flight leading to higher levels of stress prior to the next flight.

Micro-individual characteristics and CAP stress. While Johns (2006) does not include individual factors, they are central to COR theory. The first concerns *age*, with older CAPs having more experience, which often enhances coping ability (Aljurf et al., 2018), thus resulting in less resources consumption. Age may also be beneficial in helping CAPs to regulate their emotions in times of emergency (Bandeira et al., 2018). A related dimension concerns *experience* as experienced CAPs generally consume fewer resources than less experienced pilots. They will also benefit from significant self-efficacy gains arising from extensive work experience (O’Hagan et al., 2017). However, it is also possible that too many flights and experience may exhaust physical and social-oriented resources in that they may be less tolerant of mistakes and be less motivated by the flight experience (Sallinen et al., 2020). In the case of *gender*, while female CAPs are grossly under-represented throughout the industry (Dinçer & Yirmibeşoğlu, 2024; Marintseva et al., 2022; McCarthy et al., 2015), research indicates that females are more social-oriented and will invest more affective resources in communicating and helping others (Ashcraft, 2007). This may be particularly beneficial during the flight, for example, when faced with difficult situations. CAPs will also differ in terms of *fatigue and mental health* (Vejvoda et al., 2014; Venus et al., 2022). Both fatigue and poor mental health are likely to exacerbate stress

before, during, and after the flight, leading to stress and spillover of symptoms across the three flight phases (Butcher, 2002; O'Hagan et al., 2017).

Overall, the literature highlights a complex array of macro-contextual, meso-situational, and individual characteristics that potentially function as stressors for CAP across the three travel stages. These contextual factors play out in a high reliability context (Cahill et al., 2021; Muecklich et al., 2023) where safety is of prime importance, and ultimately rests with CAPs.

Methods

Research setting and sampling

The research setting comprises seven well-known commercial airlines ranging from low-cost to higher-end carriers, which operate in and from the UK. Our sample, detailed in Table 1, consisted of 28 CAPs. We interviewed 17 captains and 11 first officers with an age span of late 20s to early 60s and ranging in experience from eight to 43 years (each with at least 6500 hours of commercial flying time). Twenty-four (24) of the participants had experience across legacy *and* low-cost carriers, four had experience only within low-cost carriers, and 10 of the participants had experience of working across multiple airlines. Mirroring the low proportion of female CAPs globally (Marintseva et al., 2022; McCarthy et al., 2015), two participants were female with the remainder being male. We used a referral, or snowball, sampling approach (Noy, 2008) whereby an initial approach to two CAPs generated leads for other interviewees. While our sampling approach was non-probability, there was a degree of random selection in that the number of referrals was greater than the number of potential interviewees provided. Each participant took part in the study on a voluntary and convenient basis and was assured of anonymity in the findings. Twenty-six of the participants were unknown to the researchers, and both researchers involved in the data collection interviewed 14 CAPs, respectively.

[Insert Table 1 here]

Data collection

We utilized two methods of data collection: semi-structured interviews and documents/archival data. As semi-structured interviews are subject to inherent weaknesses including subjectivity and retrospective sense making (Alshenqeti, 2014), the use of documents and archival data contributes to method triangulation (Eisenhardt & Graebner, 2007) and documents are particularly valuable in providing insights on macro- and meso-level stressors central to our schema presented in Figure 1. Data collection took place between 2016 and 2023.

Interviews: Semi-structured interviews are an important qualitative method and are appropriate with smaller samples (Miles & Huberman, 1994). We considered them appropriate for this study because they allowed CAPs to provide their personal views and perspectives (Strauss & Weinlich, 1997). They are an inductive method, which is valuable for an emerging area, and they align with our research questions which were exploratory in nature. Interviews can provide a rich dataset and powerful insights. Our interview schedule (Table 2) comprised 13 open and exploratory questions structured around contextual, situational, and individual factors. As such, the role of the interviewer was to engage in and facilitate open dialogue with CAP participants to elicit and better understand their unique contextual perspectives and experiences. Hence, probing and ‘grand tour’ (Leech, 2002, p. 667) questions were incorporated in each interview when each of the two researchers conducting the data collection considered that greater depth was required. Most interviews lasted 90 minutes, a few lasted more than two hours, and all were recorded with participants’ permission. Our sample size broadly corresponds with other studies of CAPs (e.g., Fraher, 2019), before the researchers considered that the saturation point had been reached.

Documents and archival data: Documents are simply anything that is written down that people leave behind (Prior, 2003) and they can be viewed as an actor in the context of our study. We collected a range of archival data including documents and campaigns run by various aviation organizations, governing bodies, representative bodies, and trade unions. We reviewed international/national directives, policy documents, CAP training reports, and research reports. We also reviewed several national newspaper and media articles and websites [An illustrative list of documents and sources and can be viewed in the appendix.] The use of documents provided important insights into the contextual and situational factors impacting CAP stress in

addition to insights into the nature of the airline industry and how this has changed over time. We made use of the documents to foreground our interpretation of the interview data and evaluate the validity of interview responses (Bowen, 2009). We ensured that documents were credible, authentic, representative, and meaningful (Scott, 1990). Yin (2009) highlights that such evidence can be reviewed repeatedly and, unlike interviews, contain facts, details, and potentially broad coverage. Documents were analyzed using the same set of themes generated from the interview data.

[Insert Table 2 here]

Data analysis

Broadly following Braun and Clarke's (2006, 2022) approach to thematic analysis, all the researchers initially familiarized themselves with the transcripts and coded the full dataset independently before coming together to discuss and agree the coding framework. The data structure and arborescence of our coding framework is illustrated in Table 3. Initial (open) coding of the transcripts resulted in 38 first-order inductive codes which were grouped together, where appropriate, and located within the second order (axial) codes which then comprised our COR-informed schema (macro-contextual, meso-situational, and micro-individual factors and resources). The data reduction process then involved locating these within the relevant phase of the work cycle (i.e., pre-flight, during flight, and post-flight). From here, the selective coding process involved locating the data within the relevant sub-category and/or resource categorization in our schema. This was an iterative and reflexive process, which involved the researchers coming together regularly to discuss codes, re-visit the schema sub-categories, and cross-check their validity with reference to our literature review, document analysis, and abundant interview data. A colleague, independent of the data collection, also reviewed and corroborated our categorizations, particularly the lower-order sub-categories, helping to ensure that any potential personal biases did not influence our interpretations of the interview data (Madill et al., 2000).

[Insert Table 3 here]

Findings

We structure the presentation of our findings by theme and sub-theme as set out within our schema (Figure 1). The richness of our broader dataset can be viewed within the ‘supplementary resources’ section. Participant quotes are labeled as either ‘C’ (captain) or ‘FO’ (first officer) along with their assigned interview number.

Omnibus or macro-influences on CAP stress. Four sub-themes emerged related to the dimension of omnibus or macro-contextual factors that functioned as stressors: *cost of training and personal debt; airline commercial and financial pressures; precarious employment, HR practices and contracting; and flight time limitations (FTL)*. The documents that we analyzed illuminated the (now widespread) practice of ‘Pay to Fly’ (P2F) schemes where newly qualified CAPs essentially pay for their training while flying for an airline (e.g., ECA, 2016; Topham, 2020). The ECA (2016) describes this practice as ‘...an atypical employment form that occurs when an airline requires the pilot to pay for his/her ‘line-training’ on board of revenue-earning flights, instead of earning a salary’. The ECA (2019) also notes that ‘young pilots pay the airline for the *privilege* of gaining flight experience on its aircraft during regular revenue-earning flight’ (ECA, 2019, emphasis added). Within our interviews, CAPs expressed strong views concerning high training costs and the P2F model, and the resultant personal debt incurred by newly qualified CAPs. Participants also expressed significant anger and emotion around this issue; for example: “Airlines charge cadets for their training, I think it’s outrageous” (FO9), and “Guys are now paying at least £1,000 per month for the first seven years after getting their license; it’s kind of heart breaking really” (C2). They described the airline industry as elitist and exclusive, and acknowledged that few people could afford the financial outlay, and that young CAPs tend to come from well-off families who can provide financial support. According to one FO:

“They’re [airlines] looking for the people who can cough up the most money to get the job, it’s been that way for years, the airlines have total control over the workforce... It’s very odd; with any other type of apprenticeship a company would take you on and train you, but with airlines it’s all about money. Also, from an equality perspective, it’s been intimated that if the CAA [Civil Aviation Authority] makes it horrendously expensive then they cut out all the riffraff” (FO8).

The second sub-theme related to commercial pressures, which emerged from both the documents and the interviews. In terms of the documents, commercial pressures were evidenced through the now widespread use

of P2F schemes (ECA, 2016) and work practices associated with the recruitment and management of CAPs (Calder, 2020; ECA, 2019; Topham, 2020). CAPs were aware of the competing priorities between the airlines' emphasis on revenue and a pilot's focus on passenger comfort and safety. For example, according to one FO: "Pilots perform a safety role, and the business performs a profit role, and they don't necessarily match up... It's not black and white, it's very grey in terms of what is the businesses interpretation of a safe pilot and what's a pilot's interpretation" (FO9). Picking up on this point, another FO highlighted: "There's an underlying requirement to make a profit and get the most out of everybody. We've gone down this financial route—it's a management style that accountants now run the company. This must have a knockback on safety" (FO7).

The third sub-theme focused on contracting and HR issues and emerged as a major source of potential stress. For example, the ECA (2019) highlights that commercial pressures have impacted the types and security of employment contracts and HR practices in operation. Moreover, it has been suggested that there is a lack of information and knowledge by labor inspectors, ministries, and authorities about the actual labor and employment practices and set-ups in the aviation sector (ECA, 2019). Contracting and HR issues were also highlighted in the interviews and emerged as a major source of distrust between CAPs and airlines. For example, a captain commented: "Every time the contracts come up for renewal, they always try to get away with paying everyone less and that's been going on for years... They're always trying to shave something off... There's not a huge amount of love between airlines and pilots" (C11). Reflecting the ECA's (2019) concerns, the nature of precarious contracts in some airlines emerged as a concern within our interviews, in relation to both CAP wellbeing and safety. For instance, "In [airline] you are basically contracted out, so if you call in sick, you're never used again" (C2). Similarly, another captain reflected:

"I'm uncomfortable about the way the industry is going with a more flexible workforce. New pilots are often employed as contractors, which has massive implications. Employers can get rid of you, there's no guarantee of a long-term career with a company. It might encourage coming to work when you aren't 100% fit. It's a poor practice, it's much better to be a permanent contract employee" (C8).

The fourth sub-theme concerned flight time issues. For example, following the introduction of the new FTLs in 2016, the CAA (2015) highlighted that airline operators 'have to introduce new ... demonstrable processes and

procedures required by the regulations'. Despite this, our interviews revealed that FTLs are often treated as targets to be achieved to ensure that everyone is worked to their maximum capacity. For instance, one captain highlighted: "For maximum efficiency, they need all of us to almost fly up to our limits in order to get the most value for money (C12). A FO also explained it this way: "When it comes to FTLs, they view those very much as limits to be met rather than barriers that need to be avoided" (FO11). Specific concerns were expressed in relation to fatigue levels and the impact on safety. Pilot fatigue is a well-documented concern and was a recurring theme throughout our document analysis (e.g., ECA, 2017) and interviews. This represents a change in requirements and regulatory approach as operators are required to actively demonstrate how they manage fatigue. Yet, a FO explained: "We do incredibly long days and it wrecks your body clock" (FO10).

Discrete context or situational influences on CAP stress. Three sub-themes emerged that map onto Johns' (2006) task physical and social dimensions: *work practices and job characteristics*; *cultural and geographical distance and airport differences*; and *work-life balance*. The first sub-theme, work and job characteristics, emerged as particularly salient for CAPs and included work intensification, untenable shift patterns, and pressures to perform to the highest level. For example, they referred to challenges associated with the scheduling of 'standby' time, which requires that pilots be within one hour from the airport for the duration of the standby. One captain explained:

"...If you live within an hour of the airport standby, day are like days off, it's great; if not it's a nightmare...There are pilots who are sleeping in cars and sleeping in tents at the side of roads at the moment" (C10).

Others highlighted the work pressure associated with turnaround times. For instance: "You are constantly pressurized to work quickly, e.g., having a 25-minute turnaround which can include a change of aircraft. Meeting the demands of the schedule is the most challenging part of the job" (FO5). An important work issue concerned organizational culture with management processes particularly around managing other pilots. A captain commented: "The management of people can be difficult, pilots from very inexperienced to very experienced; sometimes the more experienced co-pilots are the most difficult as they see themselves as your peer and think they should be in your [captain's] seat" (C3). Another significant challenge concerned changing

flight crews on a day-to-day basis, meaning that pilots and cabin crew must be adaptable to working within different teams. For instance, a captain in a large airline explained: “I’ve never flown with the same flight crew for more than two flights” (C2).

The second sub-theme concerned cultural and geographical distance, and airport differences. These focused on the efficiency or otherwise of Air Traffic Control resulting from cultural differences, issues with English language, and within certain airports where there are challenging landing/take-off conditions and/or staff and skills shortages. For instance: “The level of English (of controllers) can be appalling in Eastern Europe. I fly to a particular destination quite often and it’s like the Forrest Gump movie, ‘you never know what you’re going to get’” (FO7).

The third sub-theme focused on work–life balance issues. According to a FO: “The stress that comes with juggling one’s personal life with professional work life, for me, I think that’s one of my biggest challenges. It isn’t easy sometimes to fit the job around your personal life” (FO11). Similarly, a captain highlighted: “[The job is] absolutely not what I thought—the envisioned lifestyle has not happened—you don’t get proper time off” (C5). Participants’ views on work–life balance ranged from lack of control over working hours, fueled in many cases by an inability to schedule time off, through to being away from family for extended periods. For example, the captain went on to highlight: “Leave is really contentious, pilots are not getting their holidays; they are being refused, there’s uproar” (C5). A female captain also reported having had to apply to reduce her hours to balance work and family priorities; she explained:

“My salary reflects what I do but not my quality of life. I would prefer less money and more time off, more time at home. I’ve applied for part-time... The earliest my request will be considered is 12 months I’m told” (C6).

Micro-individual influences on CAP stress. Four sub-issues emerged within this category: *age and gender issues; skills and associated responsibility; CAPs’ experience; and fatigue and mental health*. The first sub-theme, age and gender issues, highlighted a number of dimensions. On the age issue, the key factor concerned the mindset and mentality of newly qualified younger pilots who are technically competent, but far less experienced at manual flying. For example, a captain commented: “...on an Airbus it’s all computer so they are

up close with automation, not real flying. It's a slippery slope—and the irony of all ironies—pilots can't manually fly" (C5). CAPs also commented on the lack of female pilots, although it was recognized that this may be gradually changing. A first officer reflected: "There are far more female pilots now that when I started, and they're very good, but I think the 'toys for the boys' attitude has prevailed" (FO8). Indeed, on the issue of gender, a female captain highlighted: "Flying was [previously] not an option for females" (C16). While this mindset has shifted, it was also recognized by three male CAPs that their desire to fly began from a young age and was influenced by their parents. For example: "They [females] have probably not grown up as I did, thinking by the age of eight that I wanted to be a pilot" (FO8) and, similarly: "When I was seven or eight my dad took me to an air show, and I fell in love with the big Canadian air force jet. It just roared across the sky and my heart was given to flying thereafter" (C13).

The second sub-theme concerned status, skills, and associated responsibility. This primarily focused on the respect that CAPs receive from colleagues and the public, and their focus on taking responsibility that flows from that status. For example, a captain remarked: "They let me loose with a multi-million-dollar aircraft with catastrophic consequences for their business if I get it wrong" (C15). Participants also spoke of the unique aspect of their role, which demands personal responsibility for safety and lives. One captain explained:

"I do consciously think about my responsibility for passengers; it's huge, massive. You see every passenger's face as they board; a kid might wave to you, so it brings it home to you to bring them safely home in one piece" (C3).

CAPs highlighted the high level of professional knowledge needed to solve complex problems. For instance, a FO explained: "On a day-to-day basis, 90% of what we do isn't difficult, but it's the responsibility if things start to go wrong, we have to have that knowledge and skill to be able to deal with it" (FO6). Participants, therefore, spoke of the high levels of both theoretical knowledge and technical skills associated with piloting, with one FO asserting: "The level of knowledge to be a pilot is graduate level... The technical knowledge required is immense" (FO2). In a similar vein, participants discussed the ongoing level of personal commitment required, highlighting: "It's... continual self-motivation to learn and continue to keep knowledge and skills to the industry standard" (C9). Another captain summarized it this way:

“[Piloting] allows fast and safe travel around the world to become an everyday reality. This is achieved by highly trained individuals who are able to react at a moment’s notice, with the ability to draw on their years of rigorous training, discipline, and experience” (C7).

Participants, thus, emphasized the important role of experience and, in some cases, the lack of it, which may contribute to stress. The third sub-theme concerned fatigue and mental health as negative factors in the context of CAP stress. A FO commented: “Fatigue is probably the single biggest contributor in the making of mistakes, which is what kills people more than anything else” (FO9). Perhaps alarmingly, a captain highlighted: “I have seen people looking very grey, quite clearly tired, and I have seen more than a few people fast asleep, young and old” (C13). In terms of the impact of fatigue and poor mental health, participants suggested this is often dealt with privately. For instance: “A lot of people [pilots] don’t discuss fatigue or stress; they’re very conscious of the knock-on effect” (C6). Some participants even spoke about having to apply for part-time hours to manage the job demands and work–life balance. According to a FO, “More and more pilots, captains especially, are going part-time because of fatigue” (FO1).

Omnibus, discrete, and individual-level factors across the travel stages

Pre-flight. Participants highlighted numerous pre-flight factors linked to perceptions of stress. In the main, these focused on “dealing with third party contractors” (C6), “when something causes a delay” (C3), and “dealing with people” (C10). For example, a captain explained: “The pilots, especially the captain, often have to intervene and micro-manage sub-contractors” (C3). Another captain suggested: “If you’re on a short turnaround, you need everyone to be there doing their jobs smoothly and efficiently. Pilots are turning up and there’s no one to meet them, or the bus isn’t there to transport passengers to the terminal, so they have to wait and apologize to passengers” (C13). CAPs commented on the unpredictability of issues such as the weather, technical problems, and on-the-ground turnarounds as major sources of stress. A captain summarized this by explaining: “Generally, on the ground in turnarounds we work harder, once you’re actually up in the sky you breathe and relax” (C10).

In terms of individual level factors, CAPs emphasized the importance of a sense of personal responsibility and how this came into play while they were on the ground as much as during the flight. They also highlighted the

role of experience and tacit knowledge in helping them cope with issues on the ground. For instance, according to one captain: “Being on the ground, dealing with third party contractors. You have 25 minutes from arriving at the stand to push back for the next flight. It’s a pressure to keep on schedule and ground issues can make it stressful” (C6).

Departure/during the flight. During the flight, the most important meso-level factors focused on the requirement to “make quick and safe decisions” (FO6), “an adrenaline rush when the flight deck alerting system goes on” (C3), “dealing with aircraft emergencies and malfunctions” (C10), and numerous passenger emergencies. One captain suggested: “Stressful days happen a lot, especially in winter...and that’s without a technical event, never mind an emergency adding stress” (C4). The most significant individual factors related to boredom, arising from “flying backwards and forwards from the same locations” (FO8) while “doing nothing but checking instruments” (FO9). Sleep deprivation and constant tiredness also emerged as major issues on long-haul flights. According to one captain: “It’s insane, our normal is to be tired, but it’s actually abnormal as it means exhausted” (C5).

Landing/post-flight. The main macro-level factors were primarily concerned with having to cope with “extremely short turnarounds” (C3), “on the ground incidents” (C17), technical issues such as “flaps failing during landing” (FO10), and “landing gear not coming down” (C5). For example, a captain explained: “We go to work and don’t stop. You might grab a few minutes on a turnaround; maybe manage to go to the toilet and have a quick chat with the crew, but you are still working all the time with cleaners, fueling, etc.” (C4).

Individual factors predominantly focused on excessive tiredness, sleeping difficulties, and finding it hard to concentrate. The cumulative effect of this was explained, emotionally, by a FO, who highlighted:

“Everyone works periodically long days and or weeks and by the end of the week you feel like you’ve been turned inside out. But the fundamental difference, and what’s not understood, is that when you’re in a plane you are not at sea level in your standard environment...there’s a reason that people go and do altitude training, it’s really tiring. You don’t necessarily work particularly hard, but it’s exhausting” (FO9).

The role of resources across the travel stages in managing stress

Physical and energy resources. The availability or lack of physical resources was identified across the three travel stages. Pre-flight, the key issues that arose focused on tiredness, and pilots looking and feeling unhealthy. CAPs highlighted that the need to be fit and rested is something that consumes them throughout their careers. For instance, “My private life is all designed so that when I turn up for work, I am as fit, rested and as knowledgeable as I can be. As a profession it consumes you” (FO10). During the flight, fatigue emerged as the key issue and the need to be rested to cope with emergencies. Participants acknowledged that this was a continuous challenge. For example, one participant commented that, on the flight deck, every briefing starts off with “I’m knackered, watch what I do” (FO2). Indeed, in the context of safety, most CAPs referred to the enduring negative impact and effects:

“Sleep disruption, interruption and deprivation is a real problem. You operate on sleep deprivation. You end up flying tired every day with low ebbs during the day even though you are active mentally. You just get through it” (C1).

Therefore, the lack of physical resources is dominant throughout the three stages, with one FO commenting that, post-flight, “you are worn out” (FO7). This highlights the focus on the conservation of resources. Linked to physical resources, the availability or absence of energy resources was also highlighted across the three travel stages. For example, a captain remarked: “My job is really mundane, basically a three-dimensional, well-paid bus driver” (C11). A FO similarly highlighted: “[Boredom] is just something you have to deal with...I think it’s just part of the downside of the job that we just have to put up with if we want the aircraft to be flown automatically” (FO9). During the flight, boredom was the major issue with its presence impacting the availability of energy resources; for example, “Sitting doing virtually nothing other than monitoring the systems; you are not physically working your brain” (FO8). Another FO put it like this: “Unless you’re with a good crew it can get repetitive and boring, and the danger is, if you’re really fatigued, you can miss certain cues by being on autopilot yourself, as well as the airplane” (FO7).

Affective and cognitive resources. Affective and cognitive resources played a major role during the flight phase. Discussing pilot selection, one captain highlighted that the airlines do not pay attention to selecting pilots

with good affective resources. For example, the captain explained that pilot selection "...has nothing at all to do with whether you're good with passengers, whether you interact well with them, whether you interact well with your crew, and ground handling people, which are just as important in making sure things flow smoothly"

(C13). Picking up this point, another captain pointed out:

"In my 12 years here, I have known of about three cases of captains going a little bit crazy mental health wise, it's the kind of job that could do that to you... You're not assessed for 'are you a good person at work' and 'how things are going'" (C12).

Contextual and relational resources. The primacy of relational resources emerged strongly across the three travel stages. A captain related it this way:

"There were a number of aviation incidents throughout the 1970s and 80s where communication between the crew was partially to blame, leading to the introduction of CRM [Crew Resource Management]. The purpose was to combat hierarchy in the flight deck in that, if there were problems, you voiced them. The captain has ultimate responsibility, but a good captain will listen to what's going on beneath him" (C10).

One of the most important components of relational resources focused on the captain and the FO. For instance, a captain acknowledged: "There is also only so much small talk you can make with the first officer. We have long hours of doing nothing other than checking instruments... is a constant challenge" (C17). The role of relational resources in dealing with stress was consistently emphasized. For example: "Any kind of value comes from the crews you work with" (FO10) and: "There are good relationships between flight and cabin crew, we look after each other, have good banter, socialize on night stops, it's good for work" (C1). A FO highlighted the importance of relational resources this way:

"There are very good relationships between captains and first officers, same with cabin crew. You can't get on with everybody but, nonetheless, if there's one thing people who fly are good at, it's maintaining relationships in a difficult environment" (FO9).

Dispositional resources. Participants highlighted a variety of self- and social-oriented dispositional resources that were relevant at different phases of the work cycle. In terms of self-dispositional resources, they

highlighted resources related to self-confidence, a sense of responsibility, a positive mental attitude, and belief in one's experience. These resources were important in coping with emergencies and issues before, during, and after flights. Social-oriented dispositional resources emerged as particularly important during the flight phase. For example, the most salient dimension was trust in the airline (employer) with one CAP highlighting: "They [airline] say they would be supportive [about stress/mental health], but nobody trusts them" (C16). Indeed, distrust in management was highlighted as a social-oriented dispositional resource. One FO suggested: "Aviation wants to keep your problem, your problem. It's almost inhumane, not how I perceived it to be at all, it's disappointing really" (FO1). Similarly, a captain explained it this way: "I wouldn't go to the company and disclose mental health issues, I'm not confident enough about their likely reaction" (C10).

Spillover of resource gain and loss across the three flight stages

Our theoretical framework envisages that there is potential for spillover across the three travel stages, and the study findings reveal this to be the case. The most salient examples of spillover related to working patterns, fatigue, and the cumulative effect of consecutive days on duty. CAPs focused on the negative effects of shifts on their health and wellbeing and how this spilled over from post-flight to the next pre-flight phase. For instance, a FO emphasized somewhat emotionally: "Sometimes you don't realize just how your physical state is being adjusted" (FO7). Referring again to commercial pressures and the management of pilots, according to another FO: "There's the Fatigue Management System, but it can be used to fault you, i.e., 'you're tired because you didn't go home and sleep'. Again, it's a low-cost airline approach to fatigue management" (FO1). Yet, the complexity of the rostering system itself was captured by a captain, who explained: "We might find ourselves...having a flight crew finishing duty at 2200 and requiring to take-off again at 0700. That would mean that, if they were flying into a biggish city, they would get off the aircraft, get a taxi to the hotel, wind down, and get to sleep after midnight, to be back up at 0500 to get back to the airport" (C13). Another captain explained the spillover impact of shift patterns, highlighting:

"Consecutive earlies have a cumulative effect; we used to do three earlies in a row, now with the new flying hour regulations there's no limit. You get up at 4am and start work at 5am. Basically, you have six or seven hours of sleep deprivation accumulated by the end of a run of earlies and insufficient rest

periods to recover. The circadian rhythm is not recognized in rostering and there's no fixed working pattern. It's not the total hours that's the issue, it's the subtle changes like these" (C9).

Discussion

Our study advances the field of travel research by integrating theory on context (Johns, 2006), travel stages (Clawson & Knetsch, 1966; Fennell, 2017), COR theory (Halbesleben et al., 2014; Hobfoll et al., 2018), and research on CAP stress (Cahill et al., 2021; Cullen et al., 2021; Kim et al., 2024) to conceptualize and qualitatively investigate CAP stress across the travel cycle. Drawing from a transactional model of stress (Lazarus & Folkman, 1984, 1987), we utilized context theory (Johns 2006) to depict the multi-level sources of stress (omnibus, discrete and micro) that impact CAPs' resource loss across the travel stages. While the literature highlights a broader set of omnibus or macro factors that potentially impact the lived experience of stress by CAPs, the most salient factors to emerge focused on high training costs (Topham, 2020), commercial pressures (Maxwell & Grant, 2018), significant shifts in contracting and HR practices (Harvey & Turnbull, 2011), and FTLs (Efthymiou et al., 2021). Various dimensions of discrete context that aligned with Johns' (2006) categorization included task-related discrete context; demanding and fatiguing work (Vejvoda et al., 2014; Venus et al., 2022); negative job characteristics (Runeson-Broberg et al., 2014); physical dimensions of discrete context such as geographical distance and airport differences (Bendak & Rashid, 2020), particularly pertaining to air traffic control culture and practices; and social aspects of discrete context such as work-life balance issues (Bandeira et al., 2018; Cullen et al., 2021). At the micro level, stressors were linked to age and gender (Bandeira et al., 2018; Dinçer & Yirmibeşoğlu, 2024; McCarthy et al., 2015), CAP experience (Sallinen et al., 2020), and fatigue and general mental health issues (O'Hagan et al., 2017; Venus and grosse Holtforth, 2022). Collectively, these factors contribute to what Fanjoy et al. (2010, p. 19) refer to as 'pilot pushing'.

Focusing on our second question, we surfaced the significant spillover effects across the travel stages and the array of personal and contextual resources that CAPs utilize to respond to these stressors. Consistent with our theorizing, we found that, across the travel stages, stressors accumulated in an additive manner, making it particularly challenging for CAPs to respond effectively to them. Of note in this context is the pervasive influence of work-life balance issues, which impacts the different phases of travel and appears to operate as a vicious circle. In addition, work characteristics and practices have major knock-on effects in that what occurs at

the pre-flight phase is carried through the flight and post-flight phases (Reiche et al., 2021). The dynamic interplay and spillover within and across travel phases exacerbated CAP stress.

Focusing on our third question, we found that CAPs utilize a significant array of personal and contextual resources to respond to stressors with high reliance on the use of personal resources—physical and energy, affective and cognitive, contextual and relational, and dispositional resources. Consistent with our theorizing, depicted in Figure 1, and in alignment with Zhang et al. (2021), we found that dispositional (self- and social-oriented) resources underpin the other resource categories (Kaltiainen et al., 2022) and set limits on the extent to which these other resources are available to CAPs to address stress.

Theoretical implications

We make several contributions to the travel literature in the context of CAPs. First, the utilization of Johns' (2006) theory of context helps to shed light on both the 'how' and 'why' of CAPs stress. In terms of the 'how', Johns' (2006, 2018) conceptualization is very useful in expanding the repertoire of factors that explain the complex mosaic of CAPs stress. We suggest that we have expanded the types of factors that need to be considered which, in the context of Whetten (1989), can make a theoretical contribution. For example, the primacy that is given to aspects of discrete context in the case of CAPs' lived experiences of stress (Figure 1) is compounded by a complex and negative omnibus context. At the discrete context level, the salience of physical, task and social dimensions is very evident in the self-reports of CAPs. The omnibus context is characterized by different contracting arrangements, regulative influence and changing work practices within the airline industry. Context theory is also valuable in examining the 'why' question concerning the high levels of stress experienced by CAPS. Johns' (2006) conceptualization of discrete context dimensions emphasized that they are constraining in their effect, and they are highly interactive. They impose constraints on the coping abilities of CAPs and the types of resources available to cope with stress. Given their constraining and interactive nature of the three categories of discrete context they provide little in the way of contextual resource nourishment to CAPs with the result that they must continually call on their personal resources.

Second, the use travel stages (e.g., Clawson & Knetsch, 1966; Fennell 2017) helps bring temporality which is also an important dimension of discrete context (Oc, 2018) and which surfaces the unique issues at each stage and the spillover effects across stages. The use of a travel stages model helps to surface insights around how time shapes the different dimension of discrete context, and the stressors that come into play at each stage, those that are common across stages, and the value of different resources in coping with these stressors. What became clear is that dimensions of the omnibus context are all pervasive, ever-present and operating in the background to accentuate the negative impacts of discrete context dimensions. The travel stages framework brings to the fore the existence of spillover across stages in addition to allowing the incorporation of temporal and process perspectives into the investigation of CAP stress, something which is absent from the extant literature. In this context, we are responding to calls by Halbesleben et al. (2014) to bring a more dynamic and temporal understanding of the continuation of resource loss spirals that is clearly the case when it comes to CAPs.

Third, our finding on the central role of personal resources including affective, cognitive, and energy resources represents an important extension of the COR literature to the travel context and given the nature of the discrete context dimensions as constrainers, it elevates their importance for CAPs. Research in other contexts highlights the primacy of personal resources in coping with challenging stressors (Raper et al., 2023). Indeed, this is also envisaged within the transactional model of the stress process (Lazarus & Folkman, 1984, 1987) where individual differences or capacities (personal resources) come into play (Hobfoll et al., 2018; Raper et al., 2023). These personal resources come into play across the three travel stages and have a central role in helping CAPs to interpret and react to unfavorable contextual factors. This finding highlights that key ideas from the COR theory are applicable to the travel context within a job category categorized by a requirement for high reliability (Roberts, 1990) and an extreme context (Garavan et al., 2024). Our finding on the potential role of dispositional resources is also an important extension of the findings by Zhang et al. (2021) in the context of traveler stress. Dispositional resources are significantly less malleable and will either set limits or provide opportunities for the use of the broad spectrum of other resources highlighted by CAPs.

Contributions to practice

This study has important implications for organizations within the travel industry. A key takeaway is that CAPs are likely to experience significant stress across the travel stages, thus pointing to the need for travel organizations to invest resources in managing these stressors and reducing or eliminating them. Given the constraining nature of the discrete context dimensions highlighted in this study, the challenge for airlines is considerable. In this context, HR has a key role to play in addressing several aspects of discrete context surfaced in this study. These discrete or meso level elements contributing to CAPs' resource loss focus on work practices, suggesting that travel organizations should be focused on implementing practices that do not lead to resource depletion spirals. The widespread adoption of minimalistic HR practices within the airline industry, which emerged in this study as important in influencing CAP stress, requires urgent attention. These work practices are in opposition to the relational and support-type strategies that can help CAPs to address resource loss issues and achieve a greater balance in terms of resource loss and gain. It would be prudent to initiate constructive dialogue with CAPs to better understand how resource loss can be minimized, and resource gain enhanced. Therefore, trade unions need to work with airlines to develop solutions to the lack of job control and social support, fatigue, and general lifestyle factors that contribute to CAPs' stress. Second, CAPs themselves have a responsibility to invest in actions that build resilience and enhance stress coping ability. This includes developing greater self-awareness of the resources that they have available within themselves to respond to contextual and individual stress factors.

Limitations and future research

A strength of our study is that we drew from past theory and research in the travel, psychology, and stress literature domains to delineate a framework depicting the dynamic, temporal, and multi-stage and multi-level nature of CAP stress. We provide a robust exploration of our framework using both rich qualitative data derived from interviews combined with the analyses of documents and archival sources. At the same time, we acknowledge that our sample size (n=28) may limit the transferability of our findings to other travel employee groups. The organizational context is an important consideration when interpreting our results. The CAPs in our sample worked in a combination of different types of airlines suggesting that, while we achieved some variety

in the types of airline organizations, this may impact on the generalizability of our findings. Although in line with the industry demographic (Marintseva et al., 2022; McCarthy et al., 2015), we also acknowledge that our sample was predominantly male and, thus, did not allow us to investigate significant gender differences or CAP stress using an intersectional lens. There was also very limited diversity (i.e., protected characteristics) within our sample. We consider these issues to be important areas for future research. We also acknowledge the danger of bias due to reliance on participant referrals—or snowballing—within our sampling approach. However, the in-depth and exploratory nature of this study highlights several opportunities for studies of CAPs’ stress. The use of a qualitative approach surfaces not only the “*whats*” but importantly also the “*hows*” of participants’ lived experiences (Fontana & Frey, 2000, p. 646). Rich qualitative inquiry informed by COR theory that is undertaken in a longitudinal way would represent an important extension of this research and provide more insights on the temporal dynamics of CAP stress. Our findings on aspects of omnibus context point to the need to more systematically investigate how aspects of the wider institutional and industrial environment of the airline industry operate as something of toxic tandem in driving the discrete context dimensions that surfaced, as well as reinforcing their continued existence. Attention to these omnibus context dimensions suggests that researchers need to understand the interplay with the dimensions of discrete context and their consequences for CAP stress.

Conclusion

In conclusion, our study presents a qualitative investigation of CAPs’ perceptions of stressors in their work environment, how these differed across the travel stages, and the roles of personal and contextual resources in coping with these stressors. Understanding the broad spectrum of omnibus and discrete context dimensions that influence CAP stress and the use of resources in coping with these stressors is important both theoretically and practically. It is our hope that the conceptual framework that we developed here provides the foundation for future work in this area.

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Table 1. Participant sample profile

<i>Role</i>	<i>Gender</i>	<i>Flying experience</i>	<i>Employment experience</i>
17 captains (C) 11 first officers (FO)	2 female (captains) 26 male (15 captains & 11 first officers)	11 years or more: 20 10 years or less: 8	Experience across legacy <i>and</i> low-cost airlines: 24 Low-cost airlines only: 4 Multiple airlines: 10

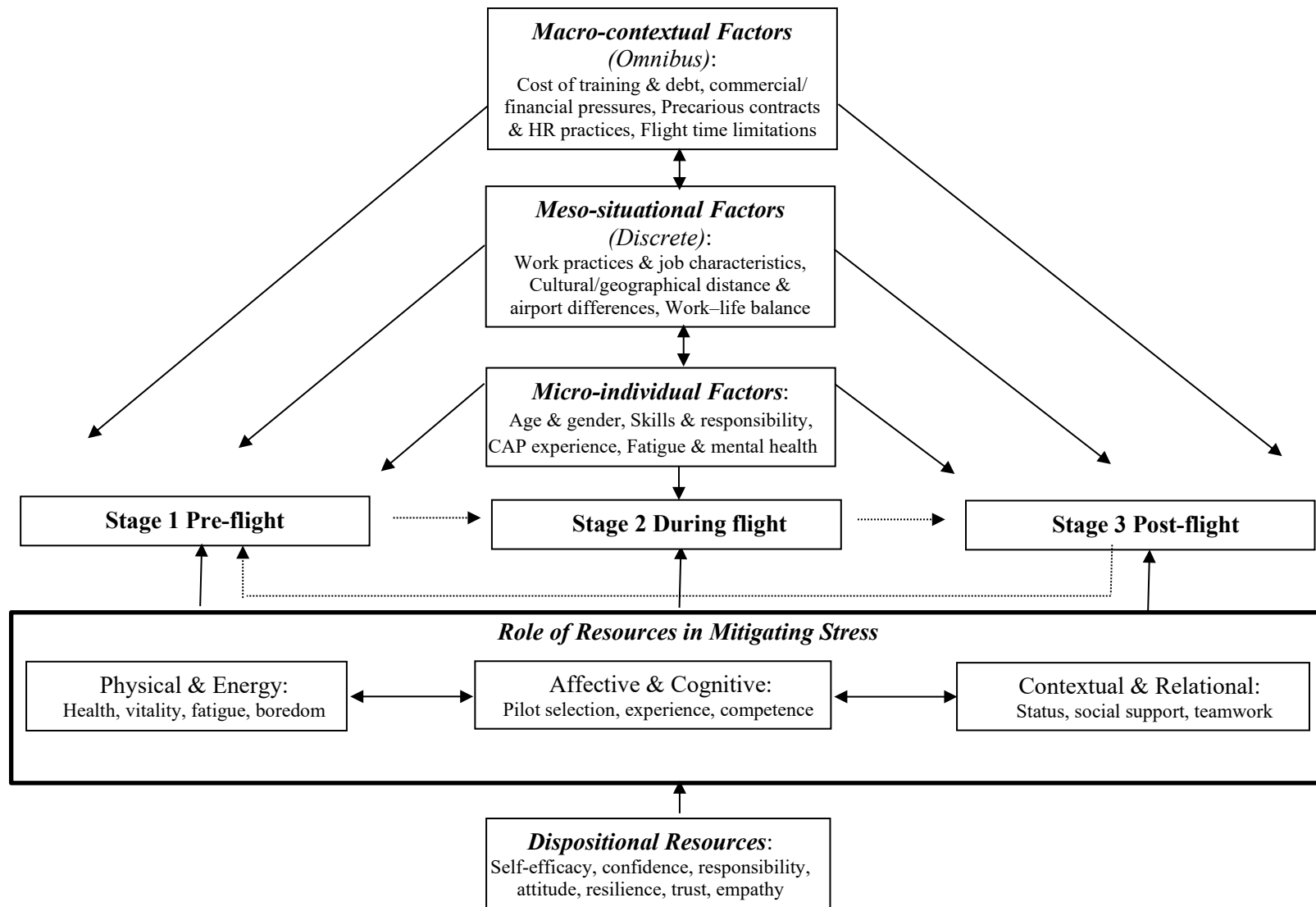
Table 2. Interview schedule

<i>Question theme</i>	<i>Core questions</i>
Employment relationship (contextual/external factors)	How would you describe the nature of your relationship with your employer/airline management? What are the key factors that shape this relationship? In what ways do you feel your employer's expectations of you are reasonable/unreasonable?
Role and responsibilities (situational factors & resources)	What is the most challenging/demanding aspect of your job? What level of autonomy do you have to make key decisions relating to your flights? To what extent do you feel trusted and supported by your employer to make autonomous decisions? In what ways do you feel your level of responsibility is/is not commensurate with your job? How would you describe the culture in which you work? Do you feel that your total reward is commensurate with your job and responsibility?
Health and wellbeing (individual factors & personal resources)	In what ways does your job impact on your health and wellbeing? To what extent do you feel that your employer provides adequate health and wellbeing support? To what extent would you feel able to discuss health and wellbeing issues or concerns with your employer? Typically, how do you deal with the negative impacts on your health or wellbeing?

Table 3. Data structure

<i>First-order codes</i>	<i>Second-order codes</i>	<i>Aggregated themes</i>
Cost of training & personal debt Commercial & financial pressures Precarious contracts & HR practices Impact of EASA Flight Time Limitations	Macro-contextual (omnibus) factors	
Work practices & job characteristics Cultural & geographical distance & airport differences Work–life balance	Meso-situational (discrete) factors	Multi-level stressors influencing CAP stress
Age & gender Skills & responsibility Pilot experience Fatigue & mental health	Micro-individual factors	
Pre-flight Departure/during flight Landing/post-flight	Meso-situational & micro-individual factors	Salience of multi-level factors on CAP stress across travel stages
Health, vitality, fatigue, boredom <i>Self-oriented</i> : self-efficacy, confidence, responsibility, attitude & resilience <i>Social oriented</i> : trust & empathy	Physical & energy resources Dispositional resources	Role of resources across travel stages in managing stress
Pilot selection, experience & competence Status, social support & teamwork	Affective & cognitive resources Contextual & relational resources	
Working patterns, fatigue & rostering		Spillover across the travel stages

Figure 1. Travel stage and COR-informed schema of CAP stress



Appendix. Illustrative document review (2015–2023)

Document sources

Research reports/working papers:

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