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Review

The criminalization of human error in aviation and healthcare: A review

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ABSTRACT

This review explores the social causes and psychological and organizational consequences of the criminalization of human error in aviation and healthcare. Increasing prevalence of criminal prosecution is seen as a threat to the health and safety of employees and entire safety-critical systems in many industries, but initiatives to counter or mitigate the trend are local and haphazard. Social causes such as a greater societal risk consciousness and intolerance of failure are examined, as well as organizational consequences for disclosure and incident reporting. Psychological consequences of the criminalization of human error are evaluated in terms of employee ill-health, an area that is under-investigated. The criminalization of professional mistakes seems to be an increasingly prevalent phenomenon at the intersection of safety work, sociology, criminology and legal as well as social justice. This paper reviews possible research directions into the criminalization of professional mistake in aviation and healthcare, in the hope of stimulating debate and eventually legitimating it as a topic of study in its own right.

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1. The problem

1.1. A trend towards criminalization

Aviation and healthcare are reporting an increase in the criminalization of human error (Michaelides-Mateou and Mateou, 2010; Michaels, 2008; Pandit, 2009; Ter Kulle, 2004; Thomas,

2007) and automatic criminal prosecution in the wake of an aviation accident is currently standard practice in many countries (FSF, 2006; ICAO, 2007). Italy has a specific criminal category of causing “air disaster,” and two airline pilots were recently sentenced to 10 years in jail after a crash that killed 19 people (RTE, 2009). In aviation, criminal prosecution of mostly front-line operators in the wake of incidents and accidents has occurred in the Netherlands (Ruitenbergh, 2002), England (Wilkinson, 1994), Spain (Brothers and Maynard, 2008), France (Esler, 2009), Italy (Learnmount and Modola, 2004), Greece, Cyprus (Mail, 2009), the

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United States (Michaels, 2008) and Taiwan (Thomas, 2002), as well as other countries. In healthcare, Sweden recently debated the introduction of the category “patient safety crime” (Akerberg, 2008). Concern with the criminalization of mistake exists in safety-critical domains beyond aviation and healthcare, including shipping (Wallis, 2010), construction (ENR, 1997), and chemical processing (Prakash, 1985). This review, however, concentrates on aviation and healthcare as so far most of the available research material comes from those two fields. The laws under which criminal prosecution of professionals currently occurs are mostly derived by extending general hazard statutes from particularly road traffic laws which criminalize the reckless endangerment of other people or property (Tingvall and Lie, 2010). The move to criminalize human error (a label that is itself a psychological attribution (Hollnagel and Amalberti, 2001; Woods et al., 2010)) could parallel the evolution of for example law on hate crime, which went from a broad, ambiguous category to a focused, determinate legal construct (Jacobs and Henry, 1996; Phillips and Grattet, 2000).

Doubts have been raised about the fairness of criminalizing errors that are made in the course of executing normal professional duties with no criminal intent (Mee, 2007; Merry and Peck, 1995; Moran, 2008; Reissner, 2009), and the capriciousness of criminal prosecution. For example, a nurse in Sweden was criminally convicted for a medication administration error of a kind that was reported to the regulator by others more than 300 times that year alone (Ödegård, 2007). Doubts also exist about the ability of a judiciary to make sense of the messy details of practice in a safety-critical domain (Anderson, 2005), let alone resist common biases of outcome knowledge and hindsight in adjudicating people's performance (Anderson et al., 1997; Arkes et al., 1981; Berlin, 2000; Dripps, 2003; Hawkins and Hastie, 1990; Hugh and Dekker, 2009; LaBine and LaBine, 1996; Laudan, 2006; Roese and Olson, 1996).

Despite these concerns, there is no coherent program of research into the social causes of a trend toward criminalization in aviation or healthcare, nor into the psychosocial or psychological consequences of criminalization for those involved. Communities specializing in disciplines concerned with criminalization and victimization are segregated from those working on risk and safety. Interesting tensions and affinities across relevant work are hardly visible, and theoretical matters for debate have not been identified; a dialogue essential to intellectual development has not really started. This paper reviews possible research directions into the criminalization of professional mistake in safety-critical domains, in the hope of stimulating debate and eventually legitimating it as a topic of study on the intersection of criminology, victimization and safety in its own right.

1.2. Crimes as inherently real or constructed phenomena

A broader theoretical issue is at stake here. In fields such as aviation and medicine, with their positivist, engineering- and androcentric biases, the nature of culpable acts is often taken as essential and unproblematic (Bosk, 2003; Croft, 2001). Practitioners have “come to view an error as a failure of character—you weren't careful enough, you didn't try hard enough. This kind of thinking lies behind a common reaction by physicians: ‘How can there be an error without negligence?’” (Leape, 1994, pp. 1851). Such an epistemology is hostile to characterizations of criminalization as relative, historically located and observer-contingent constructions of perspective and background and language. This is consistent with how criminology has long adhered to a fairly narrow scientific essentialism that sees social facts as inert and stable across observers and observations (Bjarup, 2005; Rafter, 1990). “Criminal” aspects of mistakes are seen as non-arbitrary empirical facts that are dealt with by the legitimated authorities (North, 2000), leaving little room for critical reflection on who constructed the alleged act

as a crime, and from what political or social force field it emerged (Merton, 1938; Summerton and Berner, 2003). The resulting theoretical position may have sacrificed engagement with the criminalization of mistake as a safety-scientific issue.

Reviewing the criminalization of human error from a social-scientific or even socially-constructed theoretical base can be instructive. Merton (Merton, 1938) explored how social groups couple their desired ends (e.g. not having an accident happen, achieving safe performance) to moral and institutional regulation of permissible and required behavior (Morrill et al., 1997). Where the lines go between what is acceptable and what is not, is constantly renegotiated at the intersection of societal, political and technological (e.g. industrialization, urbanization, computerization) developments, giving different expressions to legality and illegality (Dekker, 2009; Foucault, 1977). Sociological research into deviance (Goode, 1994; Rock, 1998) is thus more interested in those who draw the lines between acceptable and unacceptable behavior than those who cross them (Becker, 1963). Culpability arises in part out of people's ways of seeing and describing acts, something that not only evolves historically, but is situationally contingent (Christie, 2004). It has encouraged research into where the lines come from (Rafter, 1990), which can be seen in the work of Erikson (Erikson, 1966) and Foucault, who explicitly brought post-structuralist theory into criminal justice history with *Discipline and Punish* (Foucault, 1977). Who become moral entrepreneurs, imposing lines that separate legality from illegality, and how do these preserve or upset the status quo? (Garland, 1993, 2002). This is always an arena for political contest. It has made possible the idea of “overcriminalization” (Husak, 2008), something that people in safety-critical fields would argue is happening (ICAO, 2007; ISMP, 2007).

This paper sets up a constructionist lens to view the possible causes behind the increasing criminalization of professional mistake (Engbersen and Van der Leun, 2001; Rafter, 1990), without necessarily defending that position other than as an analytical aid. It identifies possible research trajectories into the social causes and psychosocial consequences by drawing on a variety of literatures. The review excludes occupational health/safety settings, where worker exploitation leading to injuries and fatalities in for example construction, hospitality, agriculture, forestry, horticulture, shellfish gathering and food processing is often believed to require criminalization of managerial decision making (Dekker, 2003) through for example, corporate manslaughter legislation (Goldman and Lewis, 2009). It also excludes road traffic accidents (Tingvall and Lie, 2010), in which there is societal and political support for broad categories of negligence and recklessness, in part because of near-universal participation in the system and the large autonomy of individual actors in it (Amalberti, 2001). In these latter settings, the Durkheimian function of criminalization (setting boundaries and demonstrating clearly to others where they go, *pour encourager les autres*) is widely seen as meaningful (Erikson, 1966). The negative consequences of criminalization for safety, particularly its detrimental effects on honest disclosure (Berlinger, 2005) and incident reporting (Ruitenberg, 2002), seem more articulated in healthcare and aviation than in these settings.

2. Exploring possible social causes of a criminalization trend

The social-constructionist argument does not explain specific shifts in societal assessments of criminality at specific times in history—only that such shifts occur and that they, in general social terms, are the result of societal renegotiations in what is seen as sanctionable behavior. Why professionals are more likely to be criminally prosecuted today as compared to, say, 40 years ago, is not in itself explained.

2.1. Disappearance of the accidental

The idea of an “accident” (and the concomitant growth of safety science and risk management) is relatively modern (Beck, 1992; Green, 2003). Until the scientific revolution in the seventeenth century, societies had little need for a concept like accident. Religion and superstition supplied explanatory models for misfortune, and where misfortune was going to occur was random, uncontrollable, unknowable. The notion that it was the result of divine or demonic incitement waned throughout the modern period, and was gradually replaced by a late 19-model that saw accidents as unfortunate but otherwise meaningless coincidences of space and time (Green, 2003). Over the last 40 years, however, the societal interpretation of accidents has shifted dramatically. Startling failures such as the Three Mile Island nuclear accident in 1979 and the collision of two jumbo jets at Tenerife in 1977 moved accidents back onto the center stage of our societies: Western society is said to be much more “risk conscious” (Wilkinson, 2001). Accidents are today seen as evidence that a particular risk was not managed well enough. And behind such mismanagement are people, or individuals, or single acts of omission or commission (Bittle and Snider, 2006; Green, 2003).

The last 30 years has also seen a gradual reduction in the acceptance of risk altogether (Beck, 1992), and the expectation that some safety-critical activities are accident-free, with a zero-tolerance of failure. The increasingly flawless performance of some systems may have sponsored a societal belief in their infallibility and an intolerance of failure (Amalberti, 2001). Experts are expected to make any residual accidents comprehensible, which often means explaining which risk factors were not controlled by whom. The accident has to go on somebody's account (Douglas, 1992). Note how societies have drifted from the idea of “accident.” Resources spent on formally investigating accidents would make no sense if accidents are truly “accidental” or random events.

2.2. Media, populism and anxiety

Another feature of the last 30 years is the electronically mediated democratization and increasing accessibility of knowledge, as well as consumer vocalism and activism. These can put failings of complex systems (or alleged failings of individuals in them) on fuller display than before (Anon, 2005). The media doubtlessly enjoys a strong role in celebrating certain accidents, while being able to ignore others (Dekker, 2007b; Ditton and Duffy, 1983; Ödegård, 2007; Palmer et al., 2001). A recent study links cultural and political populism to the punitiveness of a country's criminal justice system (Miyazawa, 2008), and media coverage of an event has been shown to articulate and animate social reactions to the point of constructing anti-heroes (Elkin, 1955; McLean and Elkind, 2004) and their crimes (Dekker, 2007b; Ericson, 1995; Innes, 2004; Jacobs and Henry, 1996; Tuchman, 1978). The coverage of, and discourse surrounding social issues (e.g. hate crime, immigration, and by extension: accidents and human error) have been linked to political populism, judicial responses and the criminalization of new categories of human action (Blackwelder, 1996; Engbersen and Van der Leun, 2001; Husak, 2008; Jacobs and Henry, 1996; Phillips and Grattet, 2000). This could be seen as amounting to a strong democratic project (which defenders of media sensationalism in the wake of an accident or other undesirable social event likely would (Anon, 2005; Foucault, 1975)), where the polity, through its judicial system, responds to and “fairly” represents the concerns of the society in which it operates.

As seems common in populist responses to perceived societal perils (Kieckhefer, 1976; Miyazawa, 2008), the constructed threat (e.g. human error, hate crime) can be a stand-in for more diffuse social concerns (Becker, 1963; Ben-Yehuda, 1983; Foucault,

1975). Anxiety, or undifferentiated and undirected fear, gets projected onto easily identifiable symbols of normative transgression: Witches, gays, immigrants, terrorists or any other “outsiders” (Becker, 1963). Sociology has linked modern society and its anonymity and manifold uncertainties with anxiety—as a response to social processes and cultural experiences (Wilkinson, 2001). Disembedding (the decreasing relevance of place or locality), moral fragmentation and secularization, and concomitant fears of anomie (a wholesale erosion of norms and rules and adherence to them) are cited as sources of social anxiety in the late modern age (Giddens, 1991). According to this notion, expressing societal intolerance with pilot errors or drug misadministrations is related to such anxiety. Enhancing the visibility of such deviance by criminalizing it performs ancillary cultural work by highlighting moral boundaries (Rock, 1998), assuaging society's doubts with an affirmation that lines still exist or *should* exist (Erikson, 1966; Foucault, 1975), consistent with links between populism, criminalization, and media sensationalism (Anon, 2005; Ditton and Duffy, 1983; Miyazawa, 2008).

3. Criminalizing professional mistake: Why a concern?

3.1. Interference with safety reporting and disclosure of errors

The biggest concern with judicial action in the aftermath of accidents and incidents in aviation and healthcare has focused on how it interferes with independent safety investigations, and destroys the willingness of people to voluntarily report errors and violations (Berlinger, 2005; Brous, 2008; Chapman, 2009; Dekker, 2007a, 2009; FSF, 2006; Thomas, 2007). The latter is known to be a critical ingredient to the creation of “safety cultures:” organizational cultures that encourage honest disclosure and open reflection on their own practices with the aim to constantly improve quality and safety of their products or services (Lauber, 1993). Such reflection, and the learning from failure that is encouraged (not to say, institutionalized) across industries with independent safety investigations, is hampered when professional mistake is criminalized. Here is one example:

In the wake of a June 1995 crash of an Ansett de Havilland Dash 8 near Palmerston North in New Zealand, accident investigators turned the aircraft's cockpit voice recorder (CVR) over to criminal prosecutors. The crash killed four persons on the aircraft, but not the pilots, who faced possible charges of manslaughter. Pilots in New Zealand sued to block the police use of the CVR, saying recorders should only be used for safety and educational purposes. Prosecutors prevailed and regained access to the CVR, but pilots soon began disabling CVRs on their flights. Officials have crafted a plan that would permit police use of CVRs in future cases, provided New Zealand's High Court deemed it necessary (McKenna, 1999, pp. 47–48).

A common response enacted spontaneously by professionals is to become better at making the evidence of mistake go away, and not report errors: “practising under the threat of prosecution can only serve to hide errors” (Chapman, 2009). Another effect, which may have parallels in non-healthcare industries is the practice of “defensive medicine,” which increases the use of unnecessary tests and procedures and fuels the rise in healthcare costs (Sharpe, 2004). Professional bodies also propose to better arm themselves against criminalization. ICAO (2007) proposes that countries not only persuade their judiciaries to implement changes to legal practices, but also provide guidelines to professionals on how to interact with outsiders such as the media and judiciary. In Canada some airlines have asked their regulator to sign a non-disclosure agree-

ment before their safety inspections. One aim could be to protect the identity of employees who might, by disclosing information about incidents or violations, offer evidence of what can later be construed as criminal activity, and thus potentially incriminate themselves (Schmidt, 2009). Jointly, these effects create an adversarial stance that reduces openness, and could be counterproductive to longer-term societal efforts to achieve a balance between learning and accountability in safety-critical systems (Anon, 2009; Dekker, 2007c; FSF, 2006; ISMP, 2007; Michaels, 2008; Pandit, 2009; Ter Kulle, 2004; Thomas, 2007).

3.2. The inevitability of mistake

Professional mistake is highly particular and contingent—anchored to and embedded in normal contexts in which people perform skilled work under conditions of resource constraints and outcome uncertainty (Woods et al., 2010). From this point of view, professional mistakes in aviation or healthcare can hardly be punished or sanctioned away—they are an inevitable part of the complex system in which they are generated (Vaughan, 1999). “Errors” and other undesired outcomes are often an inevitable product of the structural interactive complexity and tight coupling of most safety-critical systems (Perrow, 1984); they emerge non-randomly as anti-effects from well-organized processes (Pidgeon and O’Leary, 2000) and might well be inevitable (Vaughan, 1996, 2005). For example, as pointed out about drug errors,

“Dispensing mistakes happen. And even with the introduction of robots and Standard Operating Procedures, the Utopian ideal of a world without errors is closer to fantasy than reality.” (Chapman, 2009)

3.3. Prosecuting individuals versus pursuing system improvements

The prosecution of professionals can distort the allocation of scarce societal resources within the criminal justice system (Jacobs and Henry, 1996) when there are already bodies in place (e.g. accident investigation boards, medical discipline committees) that could be better positioned to deal effectively with the aftermath of failure in those systems (FSF, 2006). In addition, systemic interventions (through new technology) are commonly known to have better safety effects than the prosecution of individuals. For example:

“The addition of anti-hypoxic devices to anesthetic machines and the widespread adoption of pulse oximetry have been much more effective in reducing accidents in relation to the administration of adequate concentrations of oxygen to anesthetized patients than has the conviction for manslaughter of an anesthetist who omitted to give oxygen to a child in 1982.” (Merry and Peck, 1995)

Naturally, victims may derive some measure of solace, if not a sense of retribution, with the criminalization of professional mistake. Yet criminalization of an individual can also be seen by victims as unfair and counterproductive, or as scapegoating (Mellema, 2000). Even victims might interpret this as getting the organization or government regulators off the hook and oversimplifying the complexity of contributory events. This is also discussed in the safety literature (Perrow, 1984) and literatures on healthcare (Beaver, 2002; Osborne et al., 1999) and aviation (Byrne, 2002), where condensed explanations of failure and concomitant criminalization are used to protect elite interests (Levack, 1987) and avoid the costs of fixing or retrofitting a system (Goode, 1994). In addition, criminalizing an individual may not give victims the confidence that a

similar incident will be prevented in the future (Dekker, 2007c; Dekker and Hugh, 2009; Merry and McCall Smith, 2001). The mother of a 3-month old killed as a result of a medication misadministration, for instance, stopped seeing the point of the criminal trial against the nurse long before the proceedings had concluded in a guilty verdict (Ödegård, 2007). And after an air traffic controller was jailed in the wake of a 1976 accident over Zagreb that killed 176 people, the father of one of the victims led a campaign to prevent the controller’s jailing. His campaign was unsuccessful, but the father joined efforts to free the controller after he had served 2 years (Thomas, 2002).

3.4. Who draws the line?

Increasing criminalization ultimately raises the question of who—in a society or an organization or a profession—gets the power to draw the line between acceptable and unacceptable behavior (Dekker, 2009; Morrill et al., 1997; Osborne et al., 1999). From this point of view, the line is not just a foregone location but, as the review above has shown, a judgment that could be influenced by politics, power and populism.

To mitigate these influences, various industries and countries have moved to different solutions (though many have not moved much at all). Some have taken initiatives to more strongly locate the power to draw the line inside of professions, for example, by a re-asserted role of ethics or similar committees. At least one country has installed a so-called judge of instruction, who functions as a go-between before a prosecutor can go ahead with a case against a professional, by checking the prosecutor’s homework and weighing other stakeholders’ interests (which can work as long as those are fairly and equitably represented) (Dekker, 2009).

Other initiatives, most of them local or industry-specific, are being developed and range from raising awareness and rallying opinion (FSF, 2006; GAIN, 2004; ICAO, 2007), to alternative dispute resolution and mediation (Klein and Klein, 2007) and the legal protection of certain statements by professionals in the wake of failure (e.g. “I’m sorry” laws in healthcare (Berlinger, 2005; Sharpe, 2003)), to stonewalling by keeping the independent safety investigation open until the period of limitation for criminal prosecution has expired (this may be many years), or by refusing to cooperate with any judicial inquiry at all and destroying safety-related data before any access can be gained from the outside (Dekker, 2007c). Given the local nature of the statutes under which criminal prosecution is brought, it is not likely that transnational initiatives can get much practical traction. The balance, in the end, could be up to nation states themselves, where a discussion should perhaps be taken up to the level of ministries/departments of justice and other affected ministries (healthcare, transport, infrastructure). Encouraging examples include Denmark and Norway, who have been able to carve out protections for reporters of incidents (e.g. air traffic controllers or pilots) in their (aviation) laws (Eurocontrol, 2006).

4. Psychological consequences of criminalization

4.1. Coping and the interference of prosecution

Criminalization also typically leads to detrimental psychosocial consequences for the people involved. For most professionals, an error that leads to an incident or death is antithetical to their identities, a devastating failure to live up to their deontological commitment (Wolf, 1994). The memory of error stays with professionals for many years (Serembus et al., 2001). All of these effects are visible, and can be quite strongly expressed *before* any organizational sanction, civil suit or criminal prosecution. It could be ar-

gued that people punish themselves quite harshly in the wake of failure, and that society or organizations cannot make that much worse. Having made an error in the execution of a job that involves error management and prevention is something that causes excessive stress, depression, anxiety and other psychological ill-health (Berlinger, 2005). Particularly when the work involves considerable autonomy and presumptions of control over outcomes on the part of the actor, guilt and self-blame are very common, with professionals often denying the role of the system or organization in the spawning of their error altogether and blaming themselves entirely (Meurier et al., 1998; Snook, 2000). This sometimes includes hiding the error or its consequences from family and friends, the professionals distancing themselves from any possible support, and attempting to make atonement with those harmed by the error (Christensen et al., 1992).

Criminalization affirms feelings of guilt and self-blame and exacerbates their effects, which are the sorts that are linked to poor clinical outcomes in other criminological settings (Friel et al., 2008). In the case of criminalizing human error, it can lead to people departing on sick leave, divorcing, exiting the profession permanently or committing suicide (Meszaros and Fischer-Danzinger, 2000; Tyler, 2003). Another response, though much more rare, is an expression of anger and counter-attack, for example through the filing of a defamation lawsuit (Anderson, 2005; Sharpe, 2004). Criminalization can also have consequences for a person's livelihood (and his or her family), as licenses to practice may be revoked automatically (though, perversely, not always (Ödegård, 2007)) which in turn can generate a whole new layer of anxiety and stress. One pharmacist, whose medication error ended in the death of two patients, suffered from depression and anxiety to such an extent that he eventually stabbed his wife to death and injured his daughter with a knife (Serembus et al., 2001).

In the best case, professionals seek to process and learn from the mistake, discussing details of their error with their employer, contributing to its systematic investigation and helping with putting safety checks in place (Christensen et al., 1992). The role of the organization in facilitating such coping (e.g. through peer and managerial support and appropriate structures and processes for learning from failure) is hugely important, as was demonstrated for example, in a longitudinal study in a large safety-critical facility (Dekker and Laursen, 2007). Research on employee assistance programs has suggested that it is crucial that employees do not get constructed as if they are the source of the problem and treated as somehow "troubled" as opposed to "normal" employees (Cooper and Payne, 1988; Dekker and Laursen, 2007). If this condition is met, employee support, and particularly peer support, appears to be one of the most important mediating variables in managing stress, anxiety and depression in the aftermath of error, and one of the strongest predictors of coming out psychologically healthy (Dekker and Laursen, 2007). Criminalization could of course destroy any such opportunity to intervene on the part of employers or peers, particularly when the professional is incarcerated (Learmount and Modola, 2004).

4.2. Further research needs

Cases show that criminalization interferes with honest disclosure and reporting (Berlinger, 2005; Thomas, 2007). Such effects of criminalization on incident reporting in aviation, and particularly in healthcare, could benefit from further systematic and quantitative research (Michaelides-Mateou and Mateou, 2010). This would take the basis for fear of criminalization beyond the known repercussions of individual cases alone. When it comes to individual consequences, some studies into the psychological effects of human error have been conducted (Christensen et al., 1992), but most have focused either on the effects of having been

involved in an incident independent of any organizational or legal sanction, or have looked at the effects of civil litigation (Sharpe, 2004). It seems that much research has yet to be initiated to address professionals' experience in fatal outcomes and the psychological consequences of their subsequent criminalization. An important psychological consequence to be investigated empirically is the link between criminalization, professional identity and ability, particularly the ability to continue functioning as safe and ethical practitioners. Also, accountability demands that are seen as unreasonable and illegitimate (e.g. those imposed by the criminal justice system) can interfere with the conscientious execution of safety-critical tasks. There is some experimental suggestion that with unreasonable accountability demands, cognitive effort gets deflected into the management of liability risks to the detriment of task-orientation (Lerner and Tetlock, 1999) which in turn could have adverse safety consequences. This could do with more substantive empirical corroboration in safety-critical fields. Further, research on perceived fairness (Menkel-Meadow, 2000), secondary victimization (Orth, 2002) and post-traumatic stress and criminal responsibility (Friel et al., 2008) should be extended to include professionals charged with a crime, particularly professionals who by very nature and indoctrination have a strong safety ethic.

5. Conclusion

This review has explored the social causes and psychological and organizational consequences of the criminalization of human error in aviation and healthcare. Criminal prosecution there is seen as a threat to safety, and its effects on willingness to report and disclose safety-related information is well-documented, particularly in a field such as aviation, which has also germinated a number of cross-industry initiatives aimed at mitigating the effects of criminal prosecution. Most initiatives remain local and contingent on national law. The effects of criminal prosecution on individual employees has been under-investigated in aviation and other fields, except for healthcare, which has begun to study and document the psychological effects of caregivers (particularly nurses) having been involved in an adverse event over the last 15 years (Christensen et al., 1992; Wolf, 1994). These studies have not systematically included an investigation of the psychological effects of criminal prosecution, however. There seems little doubt that the possible research directions together form a substantial field of study at the intersection of safety work, sociology, psychology, criminology and legal as well as social justice.

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