Systematic biases in group decision-making: implications for patient safety

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Abstract
Key decisions in modern health care systems are often made by groups of people rather than lone individuals. However, group decision-making can be imperfect and result in organizational and clinical errors which may harm patients—a fact highlighted graphically in recent (and historical) health scandals and inquiries such as the recent report by Sir Robert Francis into the serious failures in patient care and safety at Mid Staffordshire Hospitals NHS Trust in the English NHS. In this article, we draw on theories from organization studies and decision science to explore the ways in which patient safety may be undermined or threatened in health care contexts as a result of four systematic biases arising from group decision-making: ‘groupthink’, ‘social loafing’, ‘group polarization’ and ‘escalation of commitment’. For each group bias, we describe its antecedents, illustrate how it can impair group decisions with regard to patient safety, outline a range of possible remedial organizational strategies that can be used to attenuate the potential for adverse consequences and look forward at the emerging research agenda in this important but hitherto neglected area of patient safety research.

Keywords: patient safety, group decision-making, quality, teams

Introduction
‘Two heads are better than one’ is a popular adage for health care professionals faced with clinical uncertainty. However, groups are as prone as individuals to systematic errors and biases in their judgements and decisions [1]. In this article, we draw on insights from organization studies and decision science to explore the ways in which patient safety may be threatened as a result of four systematic biases arising from group decision-making in health care contexts: ‘groupthink’, ‘social loafing’, ‘group polarization’ and ‘escalation of commitment’. For each bias, we describe its organizational antecedents, illustrate how it may impair group decision-making with regard to patient safety and outline possible remedial strategies that can be used to help organizations, staff and patients make better patient safety-critical judgements and decisions.

Biases and heuristics in health care decision-making
The delivery of safe, high-quality health care depends on the sound judgements and decisions of professionals at all levels of the health care system. Often these decisions rely on simplifying cognitive strategies known as, heuristics [2]. Depending on perspective, these mental shortcuts can either have a positive effect on quality and patient safety [3] or induce a range of deleterious outcomes [4]. Previous research has focused on systematic biases and errors in individual decision-making and has tended to ignore the fact that much ‘weighing up’ of information (i.e. judgement) and choice among discrete options (i.e. decision-making) occurs in project groups, management boards, multi-professional teams and committees at various policy ‘levels’ in the health system (see Table 1). Yet, the antecedents and consequences of flawed group decision-making for patient safety remain under researched, theoretically and empirically.

Decisions, judgements and system failure in health care
The underlying processes and mechanisms that cause adverse events and clinical errors in health care organizations are known to be complex, dynamic, multi-level and multifaceted [8]. At the level of the individual clinician or health professional, errors are often associated with limitations in cognitive processing of information (‘bounded rationality’) patchy knowledge; the application of ‘strong but wrong’ decision rules; or a depletion of previously acquired technical skills [9]. To reduce uncertainty, health care professionals often use the strategy of consulting a colleague for a second opinion. Sometimes, this occurs in routine and
Table 1  Group decision-making and judgements with regard to patient safety at different levels of the health care system

<table>
<thead>
<tr>
<th>Policy level</th>
<th>Judgement/decision-making examples</th>
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| Macro (national policy level) | • Setting national performance targets and standards  
• Establishing legal and regulatory frameworks for safeguarding quality  
• Promulgation of national clinical guidelines and service frameworks  
• Determining cost effectiveness thresholds for health technologies  
• Allocation of scare health care resources between acute care, primary care, infrastructure and R & D |

| Meso (organizational level) | • Shaping organizational strategies, structures, incentives and cultures to support the delivery of high-quality health care. These include determination of safe staffing levels, patient ratios and ‘skillmix’  
• Investments in staff training and infrastructure to support quality improvement and monitoring |

| Micro (clinical, administrative and multidisciplinary team level) | • Prioritizing team work  
• Providing ‘second opinions’ and primary source of judgement/decision support for colleagues [5, 6]  
• Planning treatments and interventions  
• The local and shared interpretation of guidelines (‘mindlines’) [7]  
• Clinical team judgements and decisions about diagnosis and the design of care pathways for patients |

institutionalized group-based aspects of the working day (for example, the ward round, nursing handover; mortality and morbidity meetings). More pragmatically, colleagues have long been the primary source of informally sought information when a health care professional is uncertain [6]. But is this faith in the value of group approaches to augmenting individual judgement and decision-making well founded?

Recent research has highlighted the negative impact of systematic cognitive biases on the quality of clinical decision-making when individuals act alone. Croskerry in the field of emergency medicine, for example, has documented many such systematic biases, and he has identified a range of possible remedial strategies [10, 11]. Common cognitive biases shown to afflict individual decision-making in clinical contexts include confirmation bias (where individuals mainly seek out information sources that are likely to confirm, rather than challenge their existing opinion), hindsight bias (whereby the knowledge of the outcomes of previous decision erroneously influence the predictability associated with a particular decision) and the ‘fundamental attribution’ bias that arises from relying on decision problems that are seen as representative of all similar problems.

Theoretically, there are sound reasons for believing that group-based approaches that may be used to enhance individual judgement and decision-making are effectual. Groups by definition comprise of two or more people and therefore have enhanced access to information and a greater capacity to process such information. However, group decision-making is a more complex process than individual decision-making, and consequently, there is more scope for things to go wrong. Decision-making processes at the individual level mainly deal with intrapersonal information and are bound by cognitive processing limitations [12]. In terms of group decision-making, however, there is an additional level of complexity because of the need for the exchange of interpersonal information. Thus, group members need not only be concerned with how they can personally arrive at a good decision but also in terms of developing good communicative and collaborative skills with other group members so as to make a good group decision. Here, problems can arise in group dynamics both on the ‘sending’ side if group members lack good communication skills and are unable to express themselves clearly and also on the ‘receiving’ side due to limited cognitive skills and perhaps poor listening habits. Empirically, it is far from certain that group decision-making improves health care quality and patient safety. Indeed, historic and recent high-profile health care scandals in the English NHS have been attributed to serious flaws in the judgement and decision-making skills of formalized health care groups, especially hospital management boards and front-line clinical teams [13].

Group biases, their causes and implications for patient safety

Group decision-making comprises three sequential stages: orientation (problem definition), evaluation (discussion of decision alternatives) and control (deciding which alternative is selected) [14]. Each stage may be subject to bias resulting from social influences and group dynamics. We now explore four biases that can potentially impact negatively on group decision-making in health care settings: ‘groupthink’, ‘social loafing’, ‘group polarization’ and ‘escalation of commitment’.

Groupthink (toeing the line)

Highly cohesive groups with strongly connected members may inhibit the expression of (true) opinion; in such cases, group harmony and unanimity may be privileged over effective
Box 1 Groupthink at the micro level of hospital service development

An emergency room (EPR) management team is concerned about the number of patients with perceived psychiatric problems and histories and which are thought to be consuming a disproportionate amount of time and resources. One of the senior, and very charismatic, senior doctors (something of an ‘opinion leader’) worked in a previous hospital that had a liaison psychiatry model of service provision (in which psychiatric health care staff were employed by the general hospital and worked in non-mental health wards and units). The doctor had a major national and international reputation for his very niche research into trauma treatment and was often used by his hospital in marketing materials to illustrate the calibre of staff employed at the hospital. All the clinical and EPR staff thought the liaison idea made perfect sense and was de facto a good idea. One of the hospital’s administrators—less popular but an avid proponent of evidence-based management—found that the extent of ‘evidence’ for and against the model was a single (very positive) uncontrolled case study and a systematic review of the components of liaison psychiatry that, at best, suggested some uncertainty about the cost effectiveness of the approach; he suggests that if they do implement it, they at least evaluate it after a year to see the financial and clinical impact. In the following months, he is given small amounts of time at various strategy and project meetings to present his case but is often cut short by the Chair, and it is clear that people check their phones and emails when his items come up for discussion. Very little time is given to scrutinizing his ideas, and the service is implemented without any planned evaluation. The charismatic clinician is pleased. Two years on it becomes apparent that the, ‘spend $1 and save $4’ cost savings in the case study used by the senior doctor to bolster his argument that, ‘it’s a no brainer’ had not been realized.

decision-making. According to Janis, the original proposer of the Groupthink concept, ‘loyalty requires each member to avoid raising controversial issues’ [15]. Clearly, this militates against the delivery of high quality and safe care where health care professionals should feel comfortable in expressing dissenting views and are willing to speak openly about concerns they may have about the quality of care. Groupthink can occur at all levels of the hierarchy in health organizations, from frontline clinical teams to senior managers and board members responsible for setting the strategic direction and governance of the organization (see Box 1).

Eight symptoms are commonly associated with Groupthink, and each has important implications for patient safety [15]:

- ‘Illusion of invulnerability’: the group thinks it is invulnerable, which may lead to over-optimism and the taking of extreme risks.
- ‘Rationalization’: group members rationalize away external warnings or threats. Numerous examples exist in health where external concerns about poor standards of care were ignored [16].
- ‘Inherent moral superiority’: an unquestioned belief in the group’s inherent morality develops and the ethical or moral consequences of decisions impacting on patient safety are under-acknowledged.
- ‘Stereotyping’: ‘outsiders’ are viewed as different or inferior. The group then uses this perceived inferiority to discredit those who oppose their views. An example in health care is when a senior clinician dismisses or fails to take seriously the concerns of other (non-clinical) staff or patients about poor quality care.
- ‘Self-appointed mind guards’: group members serve as censors or gatekeepers in order to prevent challenging or threatening information appearing before the group.
- ‘Direct pressure on dissenters’: opposing opinions or questioning a decision’s rationale results in the group applying peer pressure to coerce the dissenter into conformity.
- ‘Illusion of unanimity’: silence is interpreted as consent; consequently, the group believes that a ‘unanimous’ decision has been made.

Groupthink results in suboptimal decisions and tackling it relies in part on the ability of health care organizations to nurture appropriate ‘open’ cultures and develop supportive working environments in which Groupthink is unlikely to happen [17]. Organizational strategies include the following:

- creating a conducive and open climate at all levels of the organization—where giving, and accepting, criticism is encouraged by group leaders;
- group leaders help to foster open debate and inquiry by refraining from stating personal preferences at the start of discussions;
- establishing multiple work and task groups with different leaders to work on decision-making in parallel. Groups can also be divided into sub-groups to assess the feasibility and effectiveness of decisions;
- quality of care and patient safety issues should be discussed with trusted associates outside the group and reactions reported to the group;
- recruiting external experts to critique and challenge group decisions which may impact deleteriously of patient safety.

Social loafing (hiding in the crowd)

Group situations may reduce the motivation, level of effort and skills employed in problem-solving compared with those that an individual would deploy when working alone [1]. Such ‘social loafing’ arises because people often expend less effort in groups when they perceive that their individual contribution cannot be identified and assessed fully. If individuals feel that they are ‘lost in the crowd’, then blame for ‘slacking’ can be avoided, and conversely, there is less of an incentive for hard work as obtaining a fair share of the credit for their efforts is less likely to happen. In situations where group members feel that others in the group may leave them to do all the work (as well as take all the credit), they may decide to wait to see
how much effort others will put into the group before they put any into avoiding being seen as the ‘sucker’. If all members attempt to avoid being the ‘sucker’ then group outputs will be suboptimal [18]. Groups are particularly susceptible to social loafing when a number of specific conditions are met [19]: where it is difficult to measure and assess the contribution of each individual member; the assigned group task fails to capture the interest and imagination of group members; and when a group lacks cohesiveness and a shared sense of unity and purpose. In patient safety terms, social loafing equates to disengaged professionals who are less likely to support corporate or organizational-wide efforts to enhance patient safety (see Box 2).

Organizational strategies to ameliorate the tendency towards social loafing include:

1. **‘Increasing identifiability’**; limiting the tendency for ‘slacking off’ as group members feel they are able to ‘hide in the crowd’. Group problem-solving and decision-making tasks can be divided so that each group or committee member has their own personal targets against which their own performance is assessed [20];
2. **‘Limiting group size’**; larger groups make ‘hiding in the crowd’ far easier so setting a maximum size for a particular work group may be beneficial [18];
3. **‘Strengthening group cohesiveness’**; strengthening connectedness and the sense of social solidarity and bonding among group members may help to avoid the tendency towards social loafing. Where members are motivated to want to work with each other and share the same goals and develop a shared sense of unity of purpose then such situations can engender a feeling that slacking off would ‘let down’ the group. Of course, as we have outlined earlier, group cohesiveness increases the chances of Groupthink, so careful trade-offs are required [19];
4. **‘Allowing task choice’**; assigning group roles allows little scope for personal discretion and autonomy and can lead to complaints and frustration among group members.

Giving members choice over their role and tasks may therefore help to reduce the tendency for social loafing.

**Group polarization (taken to the extreme)**

Groups sometimes make more extreme (compound) decisions than the initial position of its (individual) members [21]. Extreme decisions are those in which the group makes either a more risky or more conservative decision rather than take a more balanced appraisal or ‘middle of the road’ approach. For example, a committee may decide to commit significant resources, incurring high opportunity and sunk costs—to implement a new policy. Conversely, the group may decide not to commit resources to alternative courses of action because of the uncertainty involved. The term ‘risky shift’ is used to describe situations when a group becomes more risk taking than the initial average risk seeking tendencies of individual members. ‘Cautious shift’ refers to situations when groups become more risk averse than the initial risk tendencies of the individual members. In both cases, the average response of individual group members becomes more extreme when they are part of the group that may in some situations and contexts have a negative impact on patient safety (see Boxes 3 and 4).

A number of features of group discussion and deliberation are associated with the tendency for groups to make extreme decisions:

1. **‘Persuasion’**; less avid supporters of an opinion may change their views to a more extreme position as a result of persuasive arguments presented by others in the group;
2. **‘Shared views’**; individuals discover—through group discussion—that others share their opinions and they then become more confident in their own opinions, resulting in some members having the confidence to take a more extreme or risky stance;
3. **‘Comparison’**; members change their mind to conform to group norms, especially when these are viewed as being more socially desirable;
4. **‘Diffusion of responsibility’**; individuals may feel that because the group is making the decision, they are not individually responsible for the decision or its outcomes. This enables them to support decisions that are more radical than they would normally make.

Sunstein outlines three key reasons for group polarization [22]:

1. **(i) groups skew their decisions towards the initial inclination of those members communicating their initial stance or view**; as people listen to these initial arguments, they adjust their views and as arguments in favour of an initial stance are more statistically likely, then these dominate;
2. **(ii) people compare themselves with others**; so a professional with a higher threshold for risk taking entering a group with a risk averse culture is more likely to moderate and align their views with the wider group norms;
3. **(iii) confidence, extremism (iii) and group corroboration are all related in a, non-virtuous, cycle. As a clinical team or committee coheres and members’ confidence**
Box 3  Group polarization at the macro level of guideline development
A national working party for developing mental health cognitive behavioural therapy wants to ensure that service users’ preferences are factored into the planning of intervention delivery that accompanies the first contact(s) with a service user. The clinical team decides to implement best practice by means of a clinical guideline. Each guideline development group member—mainly nurses, some psychologists and a senior psychiatrist—is strongly committed to the ‘socially correct’ [23] principle of ‘user involvement’. A variety of methods of gathering preferences are ‘on the table’ as decision options, ranging from using pre-established group-derived utilities (easy to use but less ‘pure’ to some members) through to the more labour intensive extreme of individualized preference elicitation using techniques from health economics such as time-trade-off techniques (much harder to use, require training, but—for some members at least—a much ‘truer’ expression of the principle of ‘user engagement’). During the 6 months of the guideline development meetings, the group moves from the (individually, but tacitly, held) belief that being sensitive to user preferences in deciding treatment is a good thing towards individualized preference elicitation in the form of structured questions to ask each service user at each initial consultation (but stopping short of formal economic methodology). Ten months later, senior nurses and doctors in a range of health care providers refuse to use the structured questions on the grounds that 30 min of the hour available at a first consult are consumed with gathering user preferences—to no obvious clinical end. The guideline is patchily adopted and variations in practice and outcome continue.

increases, their views may become more extreme; as views are corroborated then views can once again be amplified; finding out your peers share similar views increases confidence in one’s views and so on.

One of the key mechanisms for reducing unwarranted variations in clinical practice has been the clinical guideline. This ‘upstream’ strategy for improving the quality of care is a key target for limiting the tendency for polarization and the cautious shift phenomena that can compromise the quality decision-making in clinical contexts [14]. For example, Leape and colleagues compared ratings of surgical appropriateness by two panels [24]. The first were all surgeons; the second were multidisciplinary clinical teams comprising surgeons, neurologists and specialists from family practice, internal medicine and radiology. The study concluded that specialists were more likely to recommend the more risky alternative.

Techniques and approaches for ameliorating the potentially negative effects of group polarization are less well documented in the literature than for other group biases. Forming work groups comprising people from a variety of professional specialisms or disciplines may help induce a more conservative approach to decision-making, if indeed that is what is desirable and appropriate within a particular health care setting. Other approaches include encouraging group participants to take the perspective of other members so that they can better empathise with different viewpoints and thereby form better judgements [21]. The roots and antecedents of group polarization though are similar to Groupthink, and some of the suggested remedial mechanisms we have outlined earlier may also work to reduce the potential for group polarization.

Box 4  Escalation of commitment at the meso-level of a hospital board
A new Chairperson is appointed to the board of an under-performing hospital. The hospital had been assessed as providing poor clinical care and had a higher than usual rate of patient safety incidents. The new Chairman believes that investment in a new IT infrastructure to support the hospital’s clinical governance arrangements would help to improve the situation. This was discussed at board meetings, and agreement was secured to invest up to £40 million in the development of a new clinical governance data system. No financial risk assessment was undertaken of the potential risks associated with the investment. A tender was put out to develop, and a private sector company was selected to develop and install the system. After 6 months, it became apparent that the £40 million would not be enough to cover the costs of the new system and that more was required. The reasons were put down to problems in the supply chain and the additional costs of specialized equipment. The Board met and agreed to fund another £10 million to cover the additional costs. At the end of the year, the new IT system was still not fully installed because of increased costs and the Board agreed to provide another £10 million to cover the additional expense. The board members had discussed the situation and agreed that they had already sunk too much money into the initiative to pull out now. This happened several times more and the total cost of the project eventually cost £80 million, double the original budget. The board members were very defensive and explained away external criticism by their financial auditors and the general public by arguing that the additional expense had been beyond their control and to have ‘pulled the plug’ would have been even more wasteful because of the costs they had already ‘sunk’ into the project.

Escalation of commitment (throwing good money after bad)

Escalation of commitment arises when group decision-makers decide to invest resources (money, time and labour) in a project in the hope of achieving positive results but instead experience a disappointing outcome [25]. While there are situations where the optimal strategy is to commit further resources to a failing investment, the term escalation of commitment or the ‘sunken costs fallacy’ as it is also known relates to only those situations where objective evidence indicates that
continuing with an investment is unwise, and yet group decision-makers decide to invest further in spite of this [26]. Here, the group prefer to ‘stick to their guns’ in the blind hope that persistence will eventually pay off. From the perspective of mainstream, neoclassical economic theory, such actions are irrational since sunk costs cannot be altered by future action, and only future costs and benefits should be considered when deciding to pursue a particular policy or programme [27].

Escalation of commitment can arise as both the individual and group level. Compared with individual decisions, additional members in the group may increase the potential to eliminate the non-optimal committing effects of the original decision. Alternatively, if allied to group polarization or Groupthink (see above), increased commitment to the original decision may arise because of the previous group support for that position. Thus, depending on context, group composition and the interaction of other group biases, some groups may escalate more than individuals, whereas some groups will attenuate individual predispositions to escalate [28].

Escalation tendencies are more pronounced in groups where: an explanation can be constructed that the initial failure was beyond the control of the decision-making group; failure can be attributed to external events as opposed to the decision policy itself; the degree of disappointment felt by the decision-makers in the face of the negative outcome feedback; and the perceived importance of the decision [1]. Possible organizational strategies for reducing the potential for the escalation of commitment among decision-making groups include the following:

- lowering the commitment to a particular policy, by replacing decision-makers who have a strong predilection for a specific course of action with members who hold more diverse views;
- structuring incentives so that group members are not penalized for inconsistency;
- informing group members that adverse outcomes or financial losses were beyond anyone’s control to help to reduce the incentive among members to defend a previous faulty decision;
- making group decision-makers more aware of the costs of subsequent withdrawal before they decide to commit further resources in a long-term policy and thus allow the financial risks of the course of action to be calculated at the outset.

**Concluding remarks**

Judgements made by either individuals acting alone or groups may contain systematic biases. In this paper, we have argued that biased judgement and decision-making, at both the individual and group level, has the potential to impact negatively on patient safety at all levels of the health system We have also set out a number of remedial strategies that can be used to ameliorate—if not eliminate totally—the potential for systematic bias in group decision-making. However, as there is a paucity of empirical research in this area, we are not in a position to state categorically the extent to which these four biases arise in different health settings and their individual (and combined) impact on patient safety at different levels of the health care system.

Of course, groups frequently make decisions within the broader context of organizational cultures, and such cultures help to shape and underpin the social norms, values and beliefs that guide both individual and group decision-making in health care organizations [17, 26, 29]. Therefore, it is important to take into account the influences of these broader cultural forces when attempting to understand and improve group decision-making. While we know much about the influence of bias on individual decision-making, many gaps and inadequacies in the evidence base remain. In particular, we need to deepen and broaden our understanding of the organizational antecedents of biased decision-making and the impact of different types of bias on group decision-making and patient safety at different levels of the health care system; and the relative (cost) effectiveness of different organizational and de-biasing strategies that may be used to address these problems. These are important issues with practical import for patient safety which warrant further and more sustained theoretical and empirical exploration.

**References**


