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# The Logic of Human Intergroup Conflict: Knowns and Known Unknowns

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## Abstract

Human history as well as our present are ripe with violent intergroup conflicts. Despite more than 2,000 years of academic engagement with this phenomenon [1] and (way too) much evidence available for analysis [2], we are still short of encompassing theories of human belligerence. Not least, theoretical progress is thwarted by the fact that intergroup conflict is an interface phenomenon: its analysis requires the methods and background knowledge of several academic disciplines. This review pushes for intensified interdisciplinary integration in the study of human warfare. It does so by presenting a selection of pathbreaking theoretical contributions from economics, political science, social psychology, and evolutionary biology, and contrasting their respective insights and blind spots against the results of recent empirical work on human behavior before, during, and after war. As a result, three key areas are identified where theoretical breakthrough is still pending: (i) individual mobilization, (ii) the ambiguous roles of leaders, and (iii) the endogenous and dynamic interaction between conflict and its participants’ malleable preferences. Thus, this review provides an overview of the research frontier and highlights crucial challenges in the theoretical study of human warfare.

**Keywords:** intergroup conflict, war, theory, modeling

# 1 A framework for thinking about intergroup conflicts

Interdisciplinary troubles traditionally already start with terminology. A prime example of a term that causes deep fissions in scholarly debates about how to model warfare is ‘rationality’: Can we presuppose that the plotters and protagonists of intergroup violence are ‘rational actors’? Should we not rather model them as ‘devoted actors’ [3], for example, or as otherwise only partially rational or plainly irrational? The good news is that, thanks to methodological advances in recent years, formal theorizing can now treat issues like these as empirical questions and no longer needs to commit to one or the other dogma [4]. Let us briefly recapitulate how this is done.

## 1.1 Individuals

Modern models start from the question: what do agents care about? Possible answers include own material gains and losses, the well-being of other agents, group status, adherence to social norms, and more. In essence, if we can define how to measure any such object of care reliably, we can also model it. Formally this means to equip agents with a utility function,  $u_i(x)$ , where  $x$  is a vector listing the status of everything agent  $i$  cares about. Additionally,  $u_i(x)$  describes to which degree  $i$  cares about the components of  $x$  and which combinations of them  $i$  likes better than others. The only remainder from more traditional rational choice models is the assumption that agents strive to maximize their utility; i.e., when given the choice to move from a status quo  $x$  to a new state  $y$ , agent  $i$  will move to  $y$  if  $u_i(y) > u_i(x)$  and stay with  $x$  otherwise. The degree of sophistication with which agents can make such comparisons and any biases in their judgment during this process can be adjusted by the modeler, though.

Besides utilities, information and the ways in which agents process it are crucial ingredients. Do agents know how others will behave? Do they know exactly what will happen if they choose  $y$  over  $x$  or do they face uncertainty? When they form beliefs about what will happen or about what other agents are up to, how do they do so? As touched upon later, lacking or incorrect information and wrong beliefs about opponent behavior can have devastating consequences in situations of conflict.

Beyond the inner workings of the agents modelled, their externally observable features as well as their individual capacities, e.g., their level of education or their physical fitness, may also matter of course. And while it is methodologically convenient to assume that all agents in question have the same characteristics, recent work takes more and more heterogeneity between agents into account; see Section 2.2.

## 1.2 Groups

For modelling intergroup conflict, the most important difference between agents obviously is their group membership. Traditionally, most models assumed group memberships to be fixed and agents within groups to be homogenous in terms of their preferences and other characteristics. This, plus some auxiliary assumptions, allowed modelers to abstract away from conflicts of interest within groups and to treat them as if they were monadic agents themselves, thus drastically simplifying analyses. However, as we will see in Section 2.5, seminal recent work has started to investigate situations where individuals carry several group markers, possibly linked to different meaningful ‘identities’, which groups can potentially rally behind. Moreover, a crucial aspect of groups is how individual preferences are aggregated into collective actions within them. Section 2.6 highlights several issues arising at this stage.

## 1.3 Environments

In addition to a population of agents sorted, or self-selected, into groups, modelers can specify which details of the spatio-temporal environment might influence the agents’ interactions. Intuitive examples are terrain, which may give groups advantages or disadvantages, climate trends or events, which may affect groups’ means of subsistence for better or worse, or resource control, usually linked to territory. Moreover, the spatial distribution of the population may additionally make it easier for specific groups to organize local collective action.

## 1.4 Conflict

Once a population of agents, groups, and environment are characterized, conflict can be generically introduced as a contest over some valuable objective,  $V$ , between two or more factions. Members of each faction can exert costly (fighting) effort which increases, *ceteris paribus*, their group’s chances to attain  $V$ . All effort spent on fighting, however, cannot be used for other purposes. Relative to peaceful ways of distributing  $V$  between the factions, thus, conflict is wasteful and inefficient from the population’s perspective. Peaceful ways of sharing  $V$  need not always exist, though.

A huge literature has explored how the exact details of such conflicts can be modelled [5–7]. Important aspects of the resulting theoretical models are, for example, the timing of actions, how collective action within the factions is organized, how individual fighting efforts are aggregated and how they impact their group’s success probability, differences in the sizes of factions and in their valuations of  $V$ , and different types of  $V$  itself. Each of these details, as well as the countless possible ways of combining

them, can have decisive consequences for the behavioral predictions produced by the respective model.

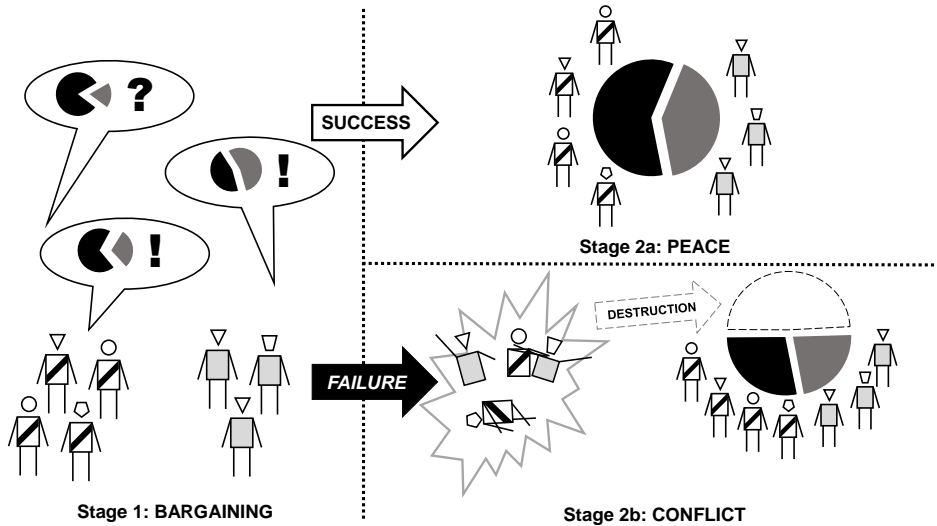
Relatively robust features across models, nonetheless, are the following three [8]: (i) the ‘stronger’ the opponent relative to self, the lower is optimal own fighting effort (‘discouragement effect’); (ii) a higher own valuation of  $V$  implies a higher optimal own fighting effort (‘incentive effect’); (iii) the larger the factions, the more destructive the conflict (‘size effect’), where destructiveness can depend on the fighting technologies used and is usually measured as an increasing function of the fighting efforts spent by all factions.

## 1.5 Equilibria and dynamics

Once all ingredients are assembled (the agents with their characteristics, their possible actions, and the information they have), models can be solved statically. That means, modelers now systematically search for those combinations of agents’ strategies, i.e., agents’ plans of action, which are equilibria. Here, equilibrium means that none of the agents would like to change their plan of action as long as all other agents stay with theirs [9]. In conflicts, such equilibria are often inefficient, capturing the fundamental logic of: “if my opponent fights me, I better fight back, even if we would both be better off not fighting at all”.

Even though such static analyses only look at ‘stable’ combinations of strategies, they can be very useful in conflict analysis, because the strategies pursued in equilibrium typically depend on ‘exogenous parameters’, i.e., on certain fixed features of agents, groups, environment, and conflict structure. Knowing which equilibria are expected to result given those parameters allows for empirical tests of a model’s ‘comparative statics’. For example, if a model predicts that smaller groups should fight harder in conflicts of a certain type, we can collect data on such conflicts involving groups of varying sizes and test precisely this hypothesis [10].

Solving models statically often is intricate enough. Additional sophistication, however, can be achieved by studying how populations of agents evolve over time. Such evolutionary (or ‘dynamic’) models then need to specify how agents learn to change their strategies over time or how unsuccessful agents are gradually replaced by more successful ones [11]. Such population dynamics can be very illuminating, particularly when populations are predicted to continuously oscillate between several states, i.e., to not reach any equilibrium, or when agents are predicted to branch into several types pursuing different strategies, thus forming separated population equilibria.



**Fig. 1** Illustration of the bargaining model of intergroup conflict. Stage 1: groups bargain about the distribution of a valuable objective  $V$ . Stage 2a: If bargaining succeeds and groups remain peaceful,  $V$  stays intact and is distributed. Stage 2b: If bargaining fails, groups enter a wasteful fight over  $V$ , resulting in some share of the value of  $V$  being destroyed.

## 2 Pathbreaking theoretical contributions

Before we discuss recent seminal theoretical contributions, it is worthwhile to briefly recapitulate the status quo ante. The best studied family of conflict scenarios is that of two or more agents, representing individuals, groups, or entire states, and a ‘pie’  $V$ . In a first stage, agents negotiate about how to split  $V$  between them; in a second stage, they can then either remain peaceful and share  $V$  according to the bargaining outcome or single-handedly trigger violent conflict. In case of conflict,  $V$  is allocated according to fighting efforts. As a result, the value of  $V$  is reduced after conflict, because fighting efforts are wasted. Figure 1 illustrates this ‘bargaining model’.

As simple as it may seem, this generic paradigm encompasses a plethora of extensions covering key aspects of conflicts [12, 13]. The crucial question is of course: why would the actors go into wasteful conflict and not be able to reach a peaceful solution, i.e., what can cause bargaining failure? Three main answers were worked out in the literature [14–16]: (i) parties might have insufficient information about the benefits and costs of conflict or might misperceive them, leading to rejections of mutually beneficial bargaining solutions; (ii) parties might be unwilling to commit to peace and/or

lacking mechanisms to enforce peaceful behavior of their opponents; (iii) some indivisible types of  $V$  might make negotiating compromises impossible: if  $V$  represents the introduction of an exclusive state religion, for example, there may be no way of compensating believers of another faith for that.

Over the past ten to fifteen years, several successful mutants of the canonic paradigm emerged in different disciplines, which added more realism along several dimensions. The following sections highlight a representative selection of such models and assess them against the backdrop of available evidence.

## 2.1 Externalities: Mass atrocities, genocide, terrorism

Violent intergroup conflict is not merely a clash between armed combatants. Civilians are always affected, too. Resulting ‘collateral damages’ can be either unintended accidents or consequences of acts with reckless disregard for civilian safety. Even worse, however, civilians are often also strategically targeted [17–20].

A seminal theoretical contribution scrutinizing key strategic incentives for large-scale killing directed at opponent groups at large was recently made by Esteban et al. [21]. They model a population divided into two factions of variable size, with one group initially holding power and the other in opposition. In each period of their repeated interaction groups decide whether to trigger a wasteful civil war over power or whether to maintain peace. After that, the (possibly new) power holder can distribute the surplus which the entire population produced in the respective period and commit mass killings of opponent group members. The central (comparative statics) predictions of this model are that incentives for mass killings: (i) increase for economies that rely heavily on the exploitation of natural resources, (ii) decrease with the productivity of labor and the destructiveness of civil war, (iii) increase with the society’s polarization, but (iv) decrease with population size (when holding polarization fixed). Somewhat paradoxically, finally, (v) stronger constraints on the ruling group’s abilities to grab resource rents, as they likely emerge with increasing democratization, are predicted to increase rulers’ incentives to kill as well. Combining several data sources and testing against both country- and ethnic-group-level panel datasets, Esteban et al. [21] find (correlational) evidence supporting all these predictions.

This model is exemplary in parsimoniously integrating several preexisting conjectures about strategic mass killings into a single model which then directly yields new, and partially unexpected, predictions about the interplay of relevant factors. According to the model, for example, constraints on the magnitude of mass killings, possibly imposed by third-party intervention, may actually increase their likelihood under some



conditions. Nonetheless, the model does not capture all types of mass atrocities, of course. In their detailed empirical work, Hultman and colleagues, for example, provide some additional support for the model [22], but also find that rebel groups, independent of societies' current political regime type, commit more mass atrocities than groups in power [23], and that some political actors use violence also against their own potential supporters [24].

A related category of violence against civilians is genocide. To some extent, violence escalated to genocidal degrees is captured in Esteban et al.'s [21] model as well. However, several genocides in history do not fit into the model's scope, as they were committed against defenseless groups who posed no realistic threat to perpetrators — the Holocaust being the prime example, ISIS' atrocities against the Yazidis and the Rohingya genocide more recent ones. While research on incentives for genocidal violence (luckily) suffers from the overall low number of genocides in history, there remains room for refined theoretical work, particularly to improve early detection and preventive measures. First attempts to model the conditions under which genocidal violence breaks out and spreads already exist [25]. Combining these with empirical work and data on the local intensity of pogroms, e.g., could substantially advance our understanding of this type of atrocity [26, 27].

Another type of violence strategically used against civilians is terrorism. Since 9/11, quite a sizeable literature has studied conflicts between starkly asymmetric parties, like a terrorist group and a state [28]. The strategic logic of terrorist attacks is usually thought of a contest where the weak side tries to hit just one valuable target of which the strong side has many to defend; if the strike is successful because the selected target is not sufficiently defended, the weak side wins, otherwise it loses [29, 30]. Previous theoretical work has focused mainly on terrorist tactics and how states can defend against them, taking the weak/strong asymmetry between opponents for granted. Recent empirical work testing this assumption, however, does not find much support for it [31]. The theoretical literature would thus benefit from closer scrutiny of the strategic choice of terrorism, as well as non-lethal forms of violence against civilians, as one of several available tactics in intergroup conflict [32]. Some advances in this direction already exist [33–36] and data for testing such models abound [37–39].

## 2.2 Heterogeneities: Disparate goals, different roles

While Esteban et al. [21] advance well beyond the traditional paradigm in their analysis of incentives to kill members of opponent groups, they stick to its approach of analyzing groups as monadic actors and assigning purely materialistic utility functions to them.

This simplifies the analysis, but is unrealistic, of course. Factions in real conflicts consist of heterogeneous individuals with possibly quite disparate goals. A separate strand of literature has focused on this dimension of complexity [40, 41]. A central theoretical result for scenarios with agents who differ in their valuation of  $V$ , for example, is a strong discouragement effect on those with low valuations. In the extreme case of completely different valuations within groups and a  $V$  equally accessible to all group members if attained, i.e., when  $V$  is a public good, only the agent who values  $V$  most is predicted to fight and everyone else to freeride on that player [42, 43].

One way to overcome this collective action problem is punishment [44–46]. Intuitively, incentives for using coercion arise when those ‘elite’ individuals who have the highest valuation of  $V$  are willing to spend part of their effort on disciplining their fellow group members. Empirically, this prediction has received partial support from experiments and anthropological fieldwork [47–49]. Psychologically, coercing fighters is obviously sub-optimal for their motivation, though. Indeed, evidence from World War II indicates that U.S. volunteers earn more decorations than draftees, suggesting that they fight harder [50]. However, so-called ‘blocking detachments’ that threaten front soldiers from the rear have regularly been used in modern wars as well and their impact on the overall effectiveness of the coerced soldiers was found to be less detrimental than suspected [51, 52]. Thus, more comprehensive empirical and theoretical work on the use of coercion toward ingroup members in intergroup conflict is urgently needed.

A complimentary route to solving the collective action problem within factions is positive incentives. Theoretically, elite actors can use transfers of shares of the spoils they receive in case of winning  $V$  to make up for less motivated players’ lower valuation of  $V$ , supposing that  $V$  is sufficiently divisible [53, 54]. Recent empirical work finds that such positive incentives are indeed effective [55, 56]. Importantly, however, these incentives need not be exclusively material. Empirical work shows that recognition among peers, e.g., via status competitions, decorations, and promotions, as well as the integration of the individual fighter into a ‘larger (ideological) cause’, e.g., via propaganda, can be effective as well [57–60]. As for coercion, refined theory adapted to the context of intergroup conflict is also lacking for positive incitement, though.

Separate from individual rewards and punishments, a very powerful mechanism to align the interests of actors within heterogeneous groups has recently been explored in great empirical detail: self-defense. Individuals and groups in conflict who are, or just perceive themselves as being, on the defensive fight significantly harder relative to agents on the offensive [61–64]. This asymmetry is not limited to humans and

echoed in military heuristics such as the 3:1 rule of thumb [65, 66]. Theory is gradually incorporating this behavioral regularity into its models and has first proximate and evolutionary explanations to offer for it [67–69].

Apart from their valuation of  $V$ , individuals realistically differ in several other regards, too. One such difference which has received way too little empirical and almost no theoretical attention to date is gender. Neither do we comprehend well when and why women engage in violent intergroup conflict as facilitators and actors nor do we have a thorough understanding of how women’s influence shapes the trajectories of pre- and post-conflict societies [70–73].

### 2.3 Inequalities: Class wars are over

While the theoretical study of heterogeneity between individuals in the context of intergroup conflict is still relatively immature, the dimension of economic inequality within and between groups represents an exception. A series of seminal theoretical contributions on this question has been made by Esteban and Ray [74–77]. Put simply, they ask if intergroup conflict is more likely to occur between economic classes, shorthand ‘the rich’ and ‘the poor’, or whether it is more likely to occur between ethnically (or religiously) demarcated factions. Their behavioral models make nuanced predictions. Most importantly, they predict an interaction between economic inequality and ethnic divisions: conflict is most likely if ethnic divisions cut across economic ‘classes’ such that polarization is high and factions are created which each contain sufficiently many rich and poor members. Why? Essentially because conflict requires both financing, provided by ‘the rich’, and fighting, provided by ‘the poor’. Esteban et al. [78] provide more detailed explanations of the theory. Empirical tests of their main prediction regarding conflict onset by Esteban et al. [79] and conflict intensity by Huber and Mayoral [80] provide consistent support. Huber and Mayoral [80] also provide a thorough analysis of more direct links from between-group economic inequality to conflict and find a robust null. The idea of ‘class struggle’ as a reason for civil wars, thus, is not well supported empirically.

This does not mean, however, that civil wars cannot be caused by economic reasons. An instructive model recently developed by Morelli and Rohner [81], for example, predicts in great detail how the geospatial distribution of natural resources interacts with the distribution of ethnic groups in fueling different types of conflict. In particular, the model predicts that groups geographically concentrated in relatively more resource-rich territories are more likely to be involved in conflict. Using the example of oil, the authors find robust support for this prediction. Analogous results were obtained by

Caselli, Morelli and Rohner [82] for interstate wars and oil. More recently, Rohner and colleagues [83, 84] expanded their analyses to several minerals, including gold and copper, and were able to show that the world-market prices of these resources influence conflict likelihood at the regional level, thus suggesting a causal link between resource value and conflict risk. In parallel, they also refined their geospatial models [85].

One caveat regarding the idea of conflict as a ‘hierarchical enterprise’ running on capital from ‘the rich’ and combat from ‘the poor’ must also be mentioned: jumping to the conclusion that it is only poor people who do the fighting because they are poor would be wrong. Poverty and conflict have been found to be correlated, indeed, particularly at the country-level [86]. However, the economic assumption used in the models discussed concerns opportunity costs. It needs to be understood as the martial potential of a group increasing in the number of those of its members for whom fighting is among their best available alternatives. This individual choice remains crucial and can be influenced by various factors, especially alternative ‘employment’ possibilities and other ‘outside options’, as well as the value of  $V$  for the relatively poor. This opportunity costs view also has some empirical support: Benmelech et al. [87], for example, find that during times of high unemployment, Palestinian terror organizations are able to recruit better educated suicide bombers allowing them to attack more difficult targets. However, material opportunity costs alone explain conflict participation only partially [88].

## 2.4 Irrationalities? Non-material motives and biased decisions

Outside of the club of formal modelers, such non-material components of explanations for the emergence of and individual participation in intergroup conflict have traditionally received much attention [89–91]. One prominent, while not particularly clear-cut, conception in this domain is ‘parochialism’ or ‘ingroup bias’ [92]. Work on ‘parochialism’ starts from the, purportedly global and stable, observation of ingroup favoring behavior across contexts [93–95]. In the terminology of social preferences, parochialism can be reconstructed as a larger weight, say  $\alpha$ , on ingroup members’ outcomes relative to the weight, say  $\omega$ , on the outcomes for outgroup members in some individual’s utility function. For  $\alpha = \omega$  we would have non-discriminatory ‘universalism’, and ‘outgroup favoritism’ for  $\alpha < \omega$ . Unfortunately, maybe due to lacking formalization, theories in this domain often lump together ingroup favoritism,  $\alpha > \omega$ , with outgroup hate, i.e., a motivation to actually harm the outgroup and not just to treat the ingroup better while still ‘being nice’ to everyone [96, 97]. However, a willingness to effectively harm outgroup members at personal cost, formally a negative weight

$\omega$ , is rarely observed [98, 99]. Moreover, neither the stability nor the universality of ingroup-favoring preferences are unequivocally established [100, 101].

The current status of ‘parochialism’ as a theory explaining intergroup conflicts thus clearly is a negative example [99, 102]. Yet, it illustrates how the formalization required by modelers can help to clarify ambiguities in verbal theorizing and, eventually, effect progress: it is indeed the case that some humans sometimes use markers of group membership to differentially perceive of and treat the people they are interacting with, of course [103–107]. What is missing, however, are parsimonious but predictive models explaining when they do so and why. Instructive advances in this direction have recently been made, though [67, 108, 109].

While a comprehensive, formal theory of group-conditional social preferences and respective belief formation processes is pending, several other ‘behavioral’ phenomena have been incorporated into formal theory successfully, where ‘behavioral’ is a placeholder for any variation on agents’ utility functions that goes beyond the maximization of own material outcomes (including risky and future ones). One example is (political) extremism, modelled as lobbying and support for extreme deviations from a political status quo, and its interaction with governmental responses [110–112]. Other examples are anger as a distortion of an optimal decision-making calculus [113, 114], hatred as an instrument of political leaders in mobilizing support for their causes or distracting from their own faults [115–118], and (mis)trust as (a lack of) confidence in the willingness of opponents to abide by peace agreements [119, 120]. Interestingly, though, vengefulness, arguably a very strong driver in many protracted conflicts [121], has not received the scrutiny it deserves in behavioral modeling, but mostly been studied experimentally so far [122–125].

## 2.5 Identities: Whom to side with?

Returning to the canonical paradigm, there is another assumption that the previously discussed models do not amend: the grouping of individuals. Traditionally, groups are simply assumed to be givens. Social psychology, however, teaches us that things are not that simple [89, 126]. Individuals usually have several group memberships which they can care about to varying degrees, i.e., they can identify more or less with each group they are part of [127]. The logic underlying such variable degrees of identification and their consequences for behavior in intergroup conflicts have begun to occupy formal modelling only relatively recently [128–130]. Formal analyses in this literature are complicated by an endogenous interaction of identity and conflict: if individuals’ utility from being member of a given group depends on that group’s status, for example, that

status may itself depend on how many individuals are willing to fight how intensively for this group in a conflict.

Sambanis and Shayo [131] argue and provide motivating evidence for the idea that such a variable strength of identification is a key component in explanations of interethnic conflict, rendering both ethnic fractionalization and polarization of societies necessary but not sufficient conditions for conflict emergence. A strong overarching national identity, they argue, can prevent ethnic divisions from becoming fault lines. They present a path-breaking model in which members of two ethnicities either identify with their ethnic group or their common nation capturing exactly this logic. Crucially, however, their model allows for heterogeneity in individual identification patterns. This feature yields an explanation of how ethnic radicalism of a few can cause large-scale conflict, dovetailing smoothly with the ‘hierarchical enterprise’ idea discussed in Section 2.3. The model predicts that, if a subgroup of ‘ethnic radicals’ is potent enough to escalate fighting to a level where it sufficiently damages the overarching national identity, this can cause less radical individuals to identify themselves ethnically, too, which then incites full-blown ethnic conflict. While the radicals in this model are ‘genuinely’ identified with their groups, sensu Whitehouse [132], this logic lends itself to strategic abuse by self-interested elites, too, of course.

While identification is harder to measure relative to other variables typically used in empirical studies on ethnic conflict, recent work found support for one of Sambanis and Shayo’s [131] central predictions. In the context of the 2012 Tuareg rebellion in Mali, Ananyev and Poyker [133] indeed observe a reduction in national identification, measured via representative surveys, in areas where fighting took place. Furthermore, instructive evidence on a link between identification and conflict perceptions comes from Ukraine during the post-2014 insurgency in the east, where survey respondents in the Luhansk and Donetsk oblasts who identified locally reported drastically different perceptions of the conflict compared to nationally identifying respondents from the same regions [134]. However, while still supporting the prediction that minority members are more likely to identify subnationally relative to majorities, Corstange [135] provides more nuanced evidence from a survey experiment with Syrian refugees. Berman and colleagues [136], finally, observe increases in ethnic identification in response to the extraction of minerals from the respective ethnic groups’ homelands, supporting the general idea that such identities can also serve to mobilize for the collective defense of valuable resources.

## 2.6 Fragilities: Brittle alliances

The last extension of the canonic ‘two groups fight over one pie’-paradigm we discuss caters to the observation that groups may fuse and fission quite dynamically in conflicts. One well-known motivation for groups to enter coalitions are ‘common-enemy effects’ [137]. Defending against a common (natural or human) threat together rather than alone can be mutually beneficial, especially when groups’ defensive means are complementary [138]. However, whether such defensive alliances are stable critically depends on the involved groups’ outside options and (their expectations about) the aggressors’ strategies [139, 140].

Vice versa, alliances may also form on the aggressor’s side. The Axis powers in World War II are a prominent historical example. Theory predicts such alliances to be brittle, though [141–143]. Their main weakness results from second-stage commitment problems: As soon as an alliance has reached their joint objective, infighting over the distribution of that  $V$  starts if commitment of the allies to peacefully sharing  $V$  cannot be enforced. Anticipating this wasteful infighting, alliance members will already initially hesitate to exert as much effort as if they were fighting over the full value of  $V$ . Empirically, this discouragement effect has been shown to be effective in contest experiments, although behavioral effects, like ingroup favoritism, were found to work against it, too [144, 145]. Things become even more complex when the number of allies rises beyond two, of course. A highly instructive model for such scenarios was recently presented and empirically validated against data from the Second Kongo War by König et al. [146].

A second branch of the theoretical literature on group fissions focuses on secessionist conflicts [147]. In such scenarios, at least one group in a fractionalized society essentially faces the decision of whether to try to break ties with the rest of society, acquiesce in whatever policies can be made peacefully, or to try to take control of government itself. An intuitively accessible prediction and well-established finding in this context is that minority groups residing in resource-rich regions are more likely to fight for independence from larger unions, as successful secession reduces the number of persons sharing the benefits, yielding higher per-capita resource rents [148].

Esteban et al. [149] recently advanced this literature by proposing a model which integrates several behavioral aspects and testing it against (macro-level) data. In line with the assumptions of identity-based theories, they find that increased cultural similarity of ethnic groups, here proxied as speaking a common language, significantly reduces the risk of a secessionist conflict between them. In addition, and as predicted by their model, they find that larger groups are less likely to fuse peacefully. Most notably,

their model also predicts that higher average patience levels should induce higher risks of secessionist relative to centrist conflict, i.e., attempts to take control of the united country instead of trying to break away. And indeed, when proxying patience using country averages of time preference measures from the Global Preference Survey [150], Esteban et al. [149] find support for this prediction, too.

### 3 Current challenges

As the preceding sections have shown, theoretical work on the constituents and complexities of intergroup conflict has been quite active in recent years. However, this activity has been scattered over several disciplines resulting in limited cross-fertilization. While progress is being made steadily, future work could substantially benefit from more interdisciplinary exchange and cooperation, facilitating, for example, greater methodological flexibility in the design of new models as well as multi-level tests of existing models' predictions. Thematic clusters which deserve more theoretical attention include the following.

#### 3.1 Mobilization: Leave, endure, or join the fight?

Contrasting the civil war in Syria with the Russian invasion of Ukraine highlights that conflicts can result in quite distinct reactions in the affected societies. Critically, the individual decision of whether to stay in or leave conflict affected regions as well as the consecutive decision, when staying, of whether to take up arms or to try to stay out of trouble have not been modeled in sufficient depth. Empirical research on the relevant incentives, motivations, and social structures shaping these decision processes provides a plethora of data which could be used to calibrate and test respective models [151–153].

#### 3.2 Leaders: Will of the people?

A second issue deserving more attention is the question of whether leaders are selected by groups for a particular purpose, e.g., leading them in war, or whether sophisticated leaders instrumentally create such circumstances to make people rally behind them. Empirically, the influence of leaders and elite networks on conflict emergence between states over centuries has recently been established quite strikingly [154, 155]; and anthropological work reinforces this view with micro-level evidence [156]. On the other hand, the idea of leader selection according to deeper-rooted societal demands has also found some empirical support [157, 158]. A better understanding of the logic



of leadership in conflict thus seems desirable, not least as it could be highly instrumental for peace-making efforts: knowing to what extent the leading elites vs. the circumstances are the main driver of a given conflict determines pacification strategies, too, of course.

### **3.3 Social capital destruction: Trauma and hurting societies**

A third, theoretically mostly unexplored domain, finally, is the endogenous and dynamic interaction of individuals' preferences with conflict (re-)emergence. Several of the models discussed earlier do take specific preferences of individuals into account, for example their patience levels or their risk preferences. However, Sambanis and Shayo [131] being the noteworthy exception, these models generally do not consider that conflict spurred by groups of individuals with specific combinations of preferences might rebound on precisely these preferences, thus creating not only materially different but also psychologically changed post-conflict societies. Empirical work on time preference change due to conflict, for example, is very limited still [159]. Relatively consistent effects of conflict exposure on social preferences have been found, though [160]. For risk preferences results are more mixed [161]. It stands to reason that the (re)shaping of preferences via conflict exposure destabilizes societies in the long-run, of course [162, 163]. Such psychological 'war traps', however, have not been tackled from a formal theoretical angle, yet.

## **4 Conclusion**

After a phase of steady decline after the end of World War II, the number of violent intergroup conflicts has been rising again since around 2010 [164]. Further improving our theoretical tools for understanding their (re-)emergence thus becomes all the more important. Hopefully, this review can help to connect researchers from the various disciplines working on this agenda.

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