

## Commentary



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# The psychology of relative state, desperation and violence: a commentary on de Courson *et al.* (2023)

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Why does violence persist when the apparent incentives for violence decline? A recent paper by de Courson *et al.* [1] offers answers based on agent-based fitness modelling, making two integrative claims about incentives to violence. First, factors increasing desperation will lead to more violence; second, communities can become trapped in violence long after the desperation subsides, as agents must demonstrate they are not easily victimized. The model's compelling insights may be particularly useful for guiding research into the relevant psychology of *relative state*, which describes dis/advantage calibrated within a competitive landscape. Here, we summarize the model, review the evidence linking the psychology of relative state to ecologically derived deprivation, and speculate on the policy implications of the model.

De Courson *et al.*'s model has numerous agents interacting in a population. Each agent has some resources which convert into fitness, but each is subject to a 'desperation threshold'—agents who fall below that threshold suffer greatly in fitness terms. Agents choose one of three social strategies: (i) take resources from others through crime (exploit); (ii) do not take but react violently to perceived exploitation (violent); or (iii) passively let others take from oneself (submit). The model addresses when each of these strategies predominates.

The model makes two important assumptions about incentives to violence. First, violence is a risky way to extract resources from others: successful violence provides easy resources, but unsuccessful violence incurs great costs. If an individual is desperate—below a minimal acceptable threshold with no safe way of meeting that threshold—the model shows they will take risks, like engaging in violence, as a desperate ploy to meet that threshold, consistent with risk-sensitivity theory (reviewed in [2,3]). The more desperate agents there are, the more violence there will be. This claim is consistent with empirical evidence indicating that such conditions as high economic inequality, poverty and a preponderance of single males are associated with elevated violence (e.g. [4–6]). Second, violence deters exploitation: others are less likely to exploit someone with a violent reputation, for fear of suffering the costs of that violence [5]. This observation is consistent with traditional models of partner choice (e.g. [7]), except that agents are choosing whom to exploit rather than ally with. De Courson *et al.* [1] combine these two explanations in a single model that explains both the high variation observed in violence rates and the persistence of violence even after conditions improve.

Importantly, de Courson and colleagues show that *both* poverty and inequality lead to exploitative crime and violence, through three key mechanisms. First, as poverty or inequality rises, more agents will fall below the desperation threshold and thus become exploitative as a desperate attempt to get above the threshold. Second, when more individuals are desperate, there are more potential exploiters, so violence is worth the risk because it deters exploitation (i.e. exploiters will avoid targeting violent individuals). Third, communities can become 'trapped' in high violence: once violence is common, all individuals must cultivate a violent reputation, lest they become the sole target for all exploiters. Thus, the violence of a community depends not just on current conditions, but also its history of violence or peacefulness.

De Courson's predictions match several established findings about violence. Poverty and inequality explain the rates of many crimes [4–6]. Exploitative

crime is reduced by the probability of being caught but not the cost (compare electronic supplementary material, figures S2 and S3), whereas violent retaliation is reduced by both the costs of violence and the probability of misidentifying peaceful acts for exploitative acts (compare electronic supplementary material, figures S4 and S5). Violence is more likely when more people can discover (and be deterred by) one's violent reputation (electronic supplementary material, figure S6). The successful accounting of numerous disparate findings is a sign of a compelling, realistic model.

De Courson's model offers an elegant functional explanation for several disparate empirical results. However, the model begs questions on how organisms perceive and assess the necessary relevant cues to inform their engagement in violence. What psychological cues underlie the assessment of desperation thresholds?

Some cues of desperation might relate to one's basic needs. If one's basic needs are chronically unmet (e.g. via enduring hunger, thirst or homelessness), agents should infer closer proximity to a minimal acceptable threshold [8]. Celibacy may be another such cue, especially when it too is chronic [9]. At a physiological level, organisms may use chronically high cortisol levels as a cue of a lack of safety. At a proximate level, negative moods with arousal have been associated with greater violence [10]. Other cues may be social: how many victims of violence does one see in the local environment? How many agents make it (effectively) to old age? How dense is the local competition among agents?

Absolute thresholds are not all that matters; in social species like humans, agents must assess where they stand relative to others in a local ecology before acting. This reflects the functional reality that fitness itself (and, psychological attention to proxies of fitness, like mates, status, resources and reputation) is necessarily relative [11]. In other words, desperation thresholds must be informed by an agent's *relative state*, which is an appraisal of one's competitive dis/advantage relative to others in a local ecology [3,12]. Inequality captures this relative phenomenon. Importantly, poverty must also (in part) be assessed in relative terms. For example, such 'objective' measures as the 'poverty line' are set in relative terms (i.e. a level of resources deemed 'adequate')—which is necessarily relatively contingent on the ever-changing, typically inflating, cost of resources like food, housing and healthcare. Of note, de Courson's model does not allow relative desperation thresholds—only an absolute threshold. Consequently, it probably underestimates the effects of inequality, especially in developed countries where fitness is less impacted by life-threatening deprivation (e.g. starvation, war, natural disasters) and more impacted by relative position within social competition (e.g. social status, desirability as a mate).

Individuals perceive their relative state based on two non-orthogonal, related components: (i) assessment of self and (ii) assessment of local ecology, including competitors [3]. Self-assessment is based on one's perceived embodied and social capital. As cues of embodied capital, how does an agent perceive how strong, fast, smart, attractive, competent or wealthy they are [13]? As cues of social capital, how many allies does one have, how much respect or contempt does one receive, how rich are one's exchange relationships and how much support does one receive [14]? Higher embodied and social capital facilitates greater ability and therefore greater projected success in social competition. But organisms must not only assess themselves: they must also assess others

on these same traits. In addition to direct observation, organisms can assess this via learning: how often does one win or lose social competitions, purchase things that others can(not), get attention from the opposite sex or receive praise or contempt for doing better or worse than others?

To tailor violence to the local ecology, organisms must also attend to cues of community violence. Some cues are obvious, like being victimized oneself, getting into fights or seeing and hearing about others fighting or victimized. At a proximate level, several other causes of crime and risk-taking can be used as cues of violence rates, including a younger population, the proportion of males, incarceration rates, public signs of disorder (broken windows), firearms availability, economic distress and a culture of violence, among others [15,16]. These cues of violence rates can act as psychological indicators of how often one must use violence as a 'toughness signal'. This is true regardless of whether there are objectively high levels of violence in the local environment; as the authors note, a history of violence is enough to imbue agents with the perception that violence may again flare up at any time.

The substantive links between de Courson *et al.*'s model and the broad empirical literature on instigative factors for crime, violence and risk-taking offer some prescriptions for policy. First, policies seeking redistribution of resources are likely to have an impact on violence only if the policy affects perceptions of desperation thresholds. The 2023 Federal Poverty Level (FPL) in the United States is \$14 580 for an individual. Given the modern costs of living in the US, that amount is unlikely to surpass any actor's desperation threshold, which fosters perceptions of disadvantage and therefore poor relative state. Redistributive policies anchored on the current FPL are insufficient, and therefore almost certainly doomed to fail to mitigate violence as a result. Second, proxies of fitness extend beyond just monetary resources to include mates, status and reputation. If those at the bottom of hierarchies do not perceive themselves to exceed desperation thresholds in these multiple currencies—most of which involve relative comparisons—then they are likely to be incentivized towards violence, consistent with de Courson's model. Third, upward socioeconomic mobility is likely to be an important mitigator of violence. The model predicts that violence rates should be higher when there is low economic mobility (electronic supplementary material, figure S7) because desperation today implies desperation tomorrow.

De Courson and colleagues offer a compelling model of how both poverty and inequality, manifesting through the experience of desperation thresholds, can facilitate and ossify violence rates over time and space. We suggest that a consideration of the psychology of *relative state*—estimation of dis/advantage in a local competitive landscape—can offer explanatory depth to the model and present testable hypotheses at a more proximate level of analysis. A richer understanding of the multiple causes (and manifestations) of motivations to violence would be of particular importance to policymakers.

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