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"Our roots run deep": Historical myths as culturally evolved technologies for coalitional recruitment

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Abstract

One of the most remarkable manifestations of social cohesion in large-scale entities is the belief in a shared, distinct, and ancestral past. Human communities around the world take pride in their ancestral roots, commemorate their long history of shared experiences, and celebrate the distinctiveness of their historical trajectory. Why do humans put so much effort into celebrating a long-gone past? Integrating insights from evolutionary psychology, social psychology, evolutionary anthropology, political science, cultural history, and political economy, we show that the cultural success of historical myths is driven by a specific adaptive challenge for humans: The need to recruit coalitional support to engage in large-scale collective action and prevail in conflicts. By showcasing a long history of cooperation and shared experiences, these myths serve as super-stimuli, activating specific features of social cognition and drawing attention to cues of fitness interdependence. In this account, historical myths can spread within a population without requiring group-level selection, as long as individuals have a vested interest in their propagation and strong psychological motivations to create them. Finally, this framework explains not only the design features of historical myths, but also important patterns in their cross-cultural prevalence, interindividual distribution, and particular content.

1. Introduction

One of the greatest puzzles in the social sciences is the unique human ability to engage in cooperation within large groups (Durkheim, 1915; Hechter, 1988; Henrich, 2020; Turchin, 2016). What makes humans willing to cooperate at the scale of clans, tribes, ethnic groups, or entire nations? Most prevalent theories in behavioral sciences propose that large-scale cooperation should be driven by characteristics of the present – like shared norms and efficient sanctioning institutions – or in the future – like economic prospects or protection against expected risk (Bowles & Gintis, 2004; Boyer, 2018; Hechter, 1988; Pisor & Gurven, 2016).

Yet, across a wide range of cultural contexts, one of the most fundamental manifestations of social cohesion in large-scale social entities is the belief in a shared and distinct past. Across societies, people take pride in the ancestral roots of their community; commemorate their long history of interactions, shared experiences, and collective struggles; and celebrate the distinctiveness of their historical trajectory (for a review, see Fig. 1). In sum, many communities around the world see their group not as a recent construct, but as an organic entity tied by ancestral bonds (Anderson, 1991; Berger & Lorenz, 2016; Hobsbawm & Ranger, 1983; Smith, 1999; Thiesse, 2021). We refer to such views as historical myths: Mental representations of the collective past that are widely shared across individual minds in a given population, and are viewed by group members as foundational for group cohesion[1] (Brown, Kouri, & Hirst, 2012; Hirst & Manier, 2008; Wertsch, 2021).

Critically, historical myths do not refer to just any popular historical element. Historical myths designate the set of historical events and narratives that are considered *foundational* and especially important to the very definition of a group – typically, an ethnic group or a nation-state. Case studies from across the world suggest that historical myths exhibit a set of highly similar features in many societies.

(i) The history of the group is portrayed as being ancient. In nationalist rhetoric, this feature typically manifests in the use of terms like "our roots" or "our origins" (Coakley, 2004; Hobsbawm & Ranger, 1983; Thiesse, 2021). It can be declined as a myth of shared ancestry – whereby people are said to be direct descendants of an ancient original people –, or as a foundation myth – which anchors the foundation of a group in a remote event. Such myths are found in societies as diverse as the Iban of Borneo, the Enga of New Guinea,

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and – by definition – most ethnic groups, where people commemorate their common ancestry and carefully record and share the history of their group (Barth, 1998; Clark & Coe, 2021; Gil-White, 2005; Horowitz, 1985; Steadman, Palmer, & Tilley, 1996; Wiessner, Polly, & Tumu, 1998).

(ii) The history of the group is portrayed as continuous in time. In the rhetoric of nationalist or ethnic movements, this feature manifests by evoking the "eternal" nature of a group (e.g., "eternal France"; "eternal Russia"). This feature emphasizes the continuity of the people throughout history regardless of the succession of regimes, economic systems, social organizations, and other such "superficial" changes (Berger & Lorenz, 2016; Smith, 1999; Thiesse, 2021).

(iii) The history of the group is not just ancient and continuous, but emphasizes the succession of shared experiences and collective challenges that group members have faced over generations. In political rhetoric, this feature manifests in the commemoration of wars, revolutions, and other collective experiences that have "made the nation" (Coakley, 2004; Smith, 1999). This feature also highlights the *narrative* nature of historical myths: The history of the group can be described as the collective story through time of a community (Smith, 1999).

As long observed by social scientists, historical myths as so defined are perceived in many societies as fundamental in defining group boundaries (Durkheim, 1915; Halbwachs, 1992). This idea was famously expressed by the nineteenth-century French scholar Ernest Renan, who argued that nations are bound not by present circumstances only, but by a "rich legacy of memories" (Renan, 2018, p. 261). Accordingly, in many countries, the promotion of historical myths is a central feature of nationalist rhetoric (Berger & Lorenz, 2016; Gillis, 1996; Hobsbawm & Ranger, 1983; Smith, 1999; Weber, 1976; see Fig. 1 for a review of more detailed examples). For instance, nineteenth-century intellectual elites of European countries actively sought to reconstitute and advertise the ancestral history and traditions of the national peasantry, with the explicit aim to spread a sense of common nationhood in the population (Thiesse, 2021; see also Hobsbawm & Ranger, 1983). Historical myths can serve not only to consolidate existing boundaries, but also to stimulate new ones. For instance, in ancient and medieval China, whenever Chinese elites sought to secure the support of neighboring peoples, official historians "added the ancestors of surrounding peoples to their own mythology, history and genealogy" with an aim to turn "foreigners into Chinese" (Hinsch, 2004, p. 83). Far from being an exclusively elitist form of political communication, the celebration of the deep roots of the nation is typically endorsed by the population as well (for a review of work on "everyday nationalism," see Mylonas & Tudor, 2021, pp. 119–120). Accordingly, lab experiments consistently show that people express a belief in the deep history of their group, and that this belief is correlated with the strength of their group identity (Boehnke et al., 2020; Jetten & Wohl, 2012; Sani et al., 2007; Sani, Herrera, & Bowe, 2009; Siromahov, Buhrmester, & McKay, 2020; Smeekes et al., 2018; Smeekes & Verkuyten, 2014a, 2014b, 2017; Warner, Kent, & Kiddoo, 2016). For instance, Dutch participants who report stronger identification with the Netherlands are significantly more likely to endorse the idea that their country has a long and shared history (Smeekes & Verkuyten, 2013). These results strongly suggest that historical myths are not just a superficial political phenomenon, but can resonate deeply with people's psychology.

In line with this idea, the significance of historical myths in human affairs often reaches remarkable – sometimes dramatic – proportions. Indeed, historical myths are frequently advertised as a central rallying force in warfare, secession, or anticolonial struggles (Berger, 2009; Coakley, 2004; Hobsbawm, 2012; Horowitz, 1985). Currently, historical myths are at the forefront of the information war that underlies the conflict between Russia and Ukraine. The belief that Russians and Ukrainians share an old history of cooperation was presented by Vladimir Putin as an essential moral argument justifying the invasion of Ukraine. Tellingly, this argument was not explicitly based on territorial claims, but appealed to the intuition that a shared history is what constitutes a people – as illustrated by Putin's interpretation of Ukrainian–Russian relations: "Our spiritual, human and civilizational ties formed for centuries and have their origins in the same sources, they have been hardened by common trials, achievements and victories … For we are one people.[2]"

In sum, historical myths are culturally successful, psychologically compelling, share remarkably similar features across diverse societies, and appear to play a foundational role in the perception of group cohesion. Yet, it is unclear why remote events from the ancient past should attract so much attention – let alone be used to promote costly acts of cooperation or intergroup conflict. Indeed, the content of historical myths is usually of no clear consequence for the present. Certainly, some historical facts may have immediate consequences, such as establishing historical precedence on land to settle current disputes, or identifying historical grievances to seek compensation (Henry, 2009; Laforcade, 2006; Traverso, 2016). Yet, historical myths typically insist on events that have much less clear consequences on current affairs. For instance, it is unclear why the belief that the French descend from a people, the Gauls, that inhabited France 2,000 years ago, should be important for French national solidarity today (Dietler, 1994), why the memory of medieval battles should play any role in reviving modern Serbian nationalism (Bieber, 2002; Lomonosov, 2021; Malešević, 2022), or why having shared ancestral origins is perceived as an important component of group cohesion among the Yoruba of Nigeria and, more generally, in many ethnic groups across the world (Ajala, 2009; Oluwaseyi, 2021; for a review, see Horowitz, 1985; Smith, 1999; Wiessner, 2018).

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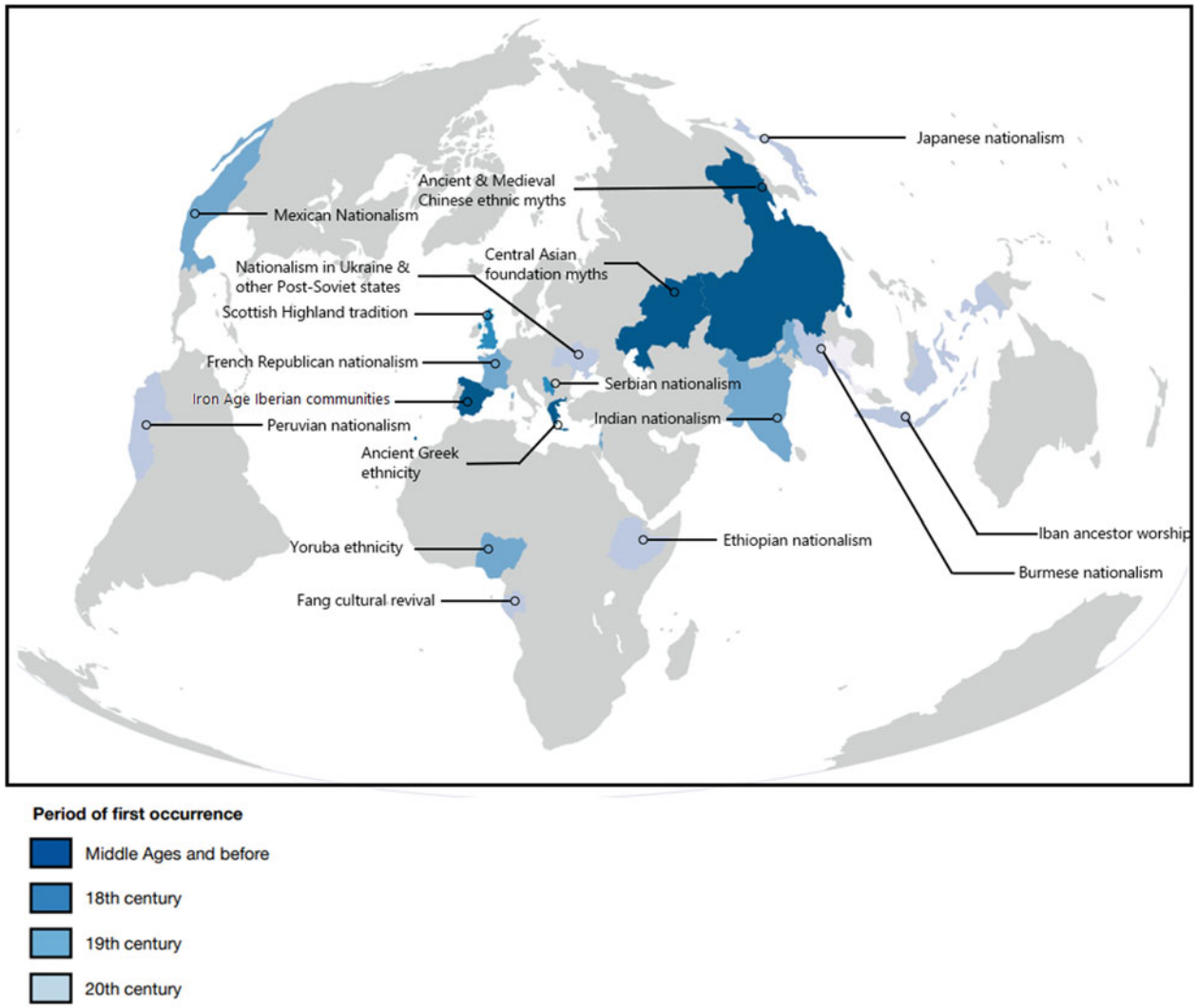


Figure 1. Map showing some successful historical myths as documented by case studies in history, anthropology, and political science. This map is not meant to offer a comprehensive view of each historical myth, nor to suggest that there isn't a high degree of variability in their endorsement across individuals, political movements or periods, but simply to describe broad patterns in the mental representations of the past shared in particular social groups that have been documented by scholars. Burmese nationalism (Salem-Gervais & Metro, 2012, pp. 30–53); ancient central Asian foundation myths (Beckwith, 2009, pp. 2–25); modern Serbian nationalism (Bieber, 2002, pp. 99–1103); Israeli nationalism (Zerubavel, 1995, pp. 13–33); Yoruba ethnicity (Ajala, 2009; Lloyd, 1955); Scottish Highland tradition (Trevor-Roper, 2008); Japanese modern nationalism (Dower, 2012); Mexican modern nationalism (Gutiérrez Chong, 2020, pp. 2–6); Peruvian nationalism (Molinié, 2004; see also Foote, 2010, for a similar example); post-Soviet states (Ukraine, Moldova, Belarus, Kazakhstan) (Kuzio, 2002a, pp. 251–258); early and medieval Chinese ethnic myths (Hinsch, 2004, pp. 84–102); ancient Greek ethnic myths (Hall, 1998, pp. 34–66); Fang cultural revival (Fernandez, 1962, pp. 4–8); Ethiopian nationalism (Clapham, 2002); Iron Age Iberian communities (Grau Mira, 2016, pp. 114–121); French Republican nationalism (Weber, 1976); Iban ancestor worship (Clark & Coe, 2021); Indian nationalism (Khan et al., 2017).

Why are historical myths – the celebration of ancestral origins, a long history of interactions and shared experiences – so culturally successful despite having no immediately clear impact on current events? Why do human groups so often rely on seemingly irrelevant narratives of their ancient past to promote social cohesion at the scale of ethnic groups or nations?

In this paper, we propose a novel theory of historical myths that integrates findings from evolutionary psychology, social psychology, evolutionary anthropology, political science, cultural history, and political economy. Our framework builds on the fact that humans need committed and numerous group members to engage in productive collective action and prevail in conflict (Boyer, 2018; Cosmides & Tooby, 2010; Tooby, Cosmides, & Price, 2006). Yet, social support is a limited rival good: Individuals who invest resources to support an ally mechanically deprive others from these resources (Boyer, 2018). In this context, people must compete for social support. To do so, coalitional recruiters can exploit one of the most important drivers of human cooperation: Fitness interdependence (Aktipis et al., 2018; Ayers et al., 2023; Cronk, Steklis, Steklis, van den Akker, & Aktipis, 2019; Roberts, 2005; Tomasello, Melis, Tennie, Wyman, & Herrmann, 2012). Indeed, individuals who are fitness interdependent have strong incentives to cooperate together – which explains why human cognition closely tracks cues of fitness interdependence (Aktipis et al., 2018; Ayers et al., 2023; Balliet & Lindström, 2023; Colnaghi, Santos, Van Lange, & Balliet, 2023; Columbus & Molho, 2022; Cronk et al., 2019; Jin, Columbus, van Lange, & Balliet, 2024). We propose that, based on their

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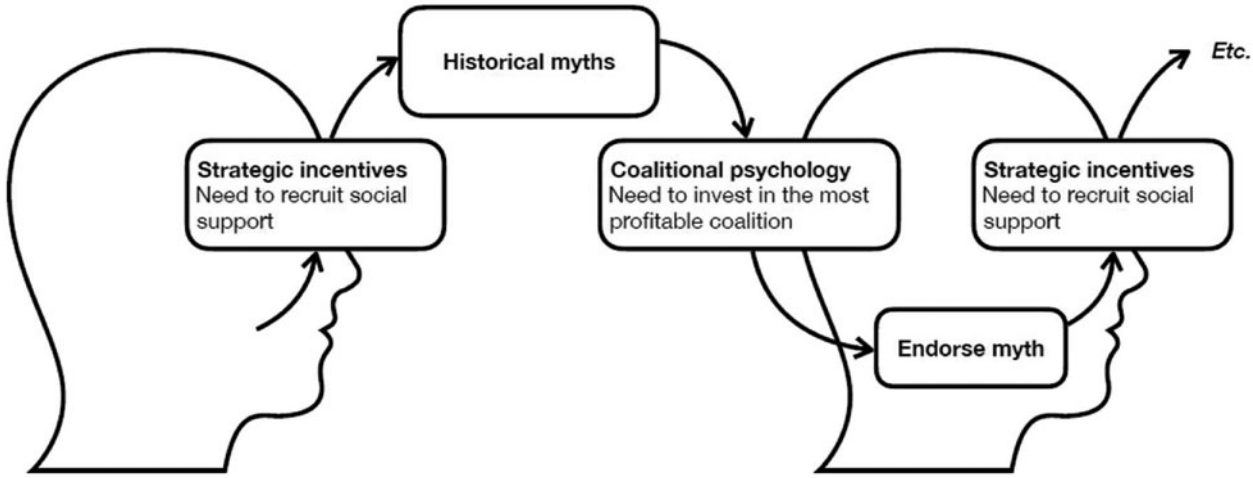


Figure 2. Schematic representation of the cultural transmission processes that lead to the cultural success of historical myths, adapted from Fitouchi and Singh (2022). Strategic individuals produce historical myths with an aim to recruit social support to their coalition. In turn, recipients can endorse the myth – although not passively. The conditions under which recipients believe in historical myths are discussed in section 6. Lastly, if individuals endorse historical myths, they in turn have a strategic incentive to transmit them to secure social support.

intuitive understanding of human social cognition, strategic agents design historical myths to advertise the high degree of fitness interdependence that binds group members.

Our account not only explains why historical myths are so culturally successful, but also why they share such remarkably consistent features across many different cultures. The typical content of historical myths, consisting of ancestral origins, a long history of interactions and shared experiences, should be conceived as a set of super-stimuli designed by strategic agents to activate specific features of their targets' social cognition, and in particular their attention to cues of fitness interdependence (see Fig. 2). Specifically, the tendency of historical myths to describe human groups as having an immemorial history of continuous cooperation – intuitively, the idea that members of the same nation have been "through so much together" – is produced to convey a cue of repeated interaction, which is interpreted by human social cognition as a cue of fitness interdependence (Barclay, 2020).

Lastly, our account of historical myths proposes a cultural evolutionary model that does not require any form of group selection and functionalism. In our perspective, the cultural evolution of historical myths relies entirely on the folk intuitions of strategic agents who seek to manipulate the social cognition of others. Historical myths can spread in a population even in the absence of group-level selection, as long as individuals have a fitness interest and strong psychological motivations to produce them (André, Baumard, & Boyer, 2023; Baumard, Fitouchi, André, Nettle, & Scott-Philipps, 2023; Glowacki, 2020; Singh, 2022; Singh, Wrangham, & Glowacki, 2017).

2. Existing accounts of historical myths

2.1. Accounts that do not specifically target historical myths

Our theory does not seek to account for the totality of culturally successful historical narratives. The concept of historical myths specifically refers to a subset of social representations of the past. The peculiarity of historical myths lies in the co-occurrence of highly specific features – they celebrate the group's ancestral origins, a long history of interactions and shared experiences, in a coherent narrative – and their perceived role as a major ideological justification for group solidarity. This peculiarity is sometimes overlooked in existing research on social representations of history and their role in human politics. As a result, some theories may explain why some particular historical elements (characters, events, narratives, etc.) can gain social and political salience, but do not address the specific puzzle of historical myths. To illustrate this point, we review three such theories.

(i) First, for instance, authors frequently note that historical narratives are typically used to justify territorial claims. Territorial expansions and the resulting counterinsurgencies are almost systematically supported by historical narratives that present the land of interest as the historical property of a particular group. Overwhelmingly, land property is justified by claiming precedence ("we were here before you") (see, for instance, Gori, 2013). In such cases, historical narratives seem strategically designed to activate specific features of human moral psychology – in particular, the cross-culturally recurrent intuition that ownership – including collective ownership – ought to be assigned based on first possession (Kanngiesser, Rossano, & Tomasello, 2015; Verkuyten & Martinovic, 2017; Verkuyten, Sierksma, & Martinovic, 2015).

(ii) A second recurrent explanation for the political use of history stems from the observation that it is increasingly used as a tool to redress historical grievances. In particular, historical narratives are frequently used by minorities to reclaim compensation from states or companies – usually in the form of financial resources or affirmative action. For instance, in the second half of the twentieth century, social movements representing European Jews, African Americans, or immigrants of African descent in Europe have mobilized to obtain compensation for their history of oppression by various states (Henry, 2009; Laforcade, 2006; Traverso, 2016).

(iii) Third, as observed by historians, elites have long promoted historical figures as role models to be imitated by the masses (Weber, 1976). For instance, the French Third Republic is famous for celebrating role models such as Voltaire, Rousseau, Victor Hugo, Louis Pasteur, and Emile Zola, organizing national funerals and regular commemoration on

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their birth and death dates (Ben-Amos, 2000). The commemoration of such prestigious individuals probably aims to incentivize similar behaviors by sending a public signal that they are highly valued in society.

All these psychological mechanisms certainly explain why some historical elements can elicit public interest and play an important role in human politics. However, we argue, these theories do not answer our main puzzle, as they do not account for the core features of historical myths and why they seem to play such a foundational role in establishing group cohesion.

It is certain that historical material can be strategically mobilized to claim possession over a territory and seek compensation for past grievances. However, from a legal and ideological perspective, claiming territory only requires a narrative showing historical precedence on a land; and seeking compensations would only require historical evidence of past torts. Yet, historical myths typically do much more in portraying the ancestral bonds that have tied a people together, and the long history of salient cooperative events that have "made the nation" (Liu & Hilton, 2005; Smith, 1999; Thiesse, 2021; Weber, 1976, see Fig. 1 for an overview). It is this sense of deep connectedness and solidarity through time, not mere occupation of a land or specific historical grievances, that most characterizes historical myths (Smith, 1999). Likewise, it is very likely that history can be used to incentivize specific behaviors or norms by celebrating historical figures that embody them. However, this theory does not explain the most important features of historical myths, such as why they emphasize the ancient roots of the nation or why a sense of shared history is perceived as a driver of social cohesion.

The discussion of these mechanisms highlights the specificity of historical myths compared to other politically salient information about history. Although we acknowledge the importance of the latter, they were not included in the scope of this article. The main reason is that they have quite straightforward explanations. In all of the listed alternative accounts, the historical material has a relatively clear connection to pressing issues in the present. For example, the interest of minority movements for historical grievances is readily explained by the fact that they have an immediate interest in advertising them to obtain fair compensation. Historical myths, by contrast, are especially puzzling because they commemorate a very distant past or aspects of the group's history with much less obvious impacts on current affairs – such as West African ethnic groups advertising their ancestral existence (Horowitz, 1977, 1985) or Indian nationalists reclaiming the legacy of the Aryan civilization (Khan, Svensson, Jogdand, & Liu, 2017) –, and yet present this shared history as a defining feature of nationhood. Hence, in the following, we focus on accounts that explicitly try to answer the main puzzle of historical myths, which is why a shared history is perceived as an essential condition for group cohesion in many societies.

2.2. Elite manipulation

By far, the most prevalent explanation for historical myths – but also for nationalism in general – is top-down elite manipulation. In this approach – sometimes called *instrumentalism* – elites produce historical myths to manipulate the masses for their self-interested purposes (Anderson, 1991; Gellner, 2006; Hobsbawm, 2012; Hobsbawm & Ranger, 1983). Case studies show that elites do indeed produce nationalist rhetoric, which in many circumstances seem to reflect self-serving motives (Gellner, 2006; Hechter, 1988, 2000; Hobsbawm, 2012). More recent quantitative work supports such claims: For instance, governments invest more in public schools – which typically promote national ideology – following social unrest (Paglayan, 2022; see also Solt, 2011). Although the elite manipulation hypothesis is well documented and consensual, it does not actually *explain* why historical myths are so culturally successful. If anything, it reframes the puzzle in a more acute way. Assuming that powerful elites want citizens to commit to the nation and self-sacrifice in wars, and that they are willing to manipulate information to do so, why emphasize the past? Elites may boast the country's current military power, public services, prestige, or make appealing promises for the future. Why then do they also celebrate the long history of the group? Why do self-interested individuals advertise information about the shared past – and not just more directly palatable arguments – to mobilize the masses?

Instrumentalism also has a second limitation. By definition, this approach is focused on the producer's side – the elites – but fails to provide a comprehensive account of the reception of historical myths. In particular, a common assumption of instrumentalist accounts is that the masses are actually indoctrinated by the elites (Boyer, 2018; Gat, 2012). For instance, Eugen Weber's famous study of French nation-building in the nineteenth century suggests that the national historical narrative transmitted in French public schools successfully inculcated patriotism in the rural masses (Weber, 1976). Although case studies frequently report an apparent correlation between history curricula and the development of a national consciousness, it is not clear that this relationship is causal (Mylonas & Tudor, 2021). Indeed, research on the psychology of human communication shows that humans do not passively absorb whatever cultural norm is in their environment. Rather, they are equipped with cognitive mechanisms for epistemic vigilance, by which they are able to track false information (Mercier, 2017, 2020; Sperber et al., 2010). Moreover, the way humans transmit and receive cultural traits is heavily dependent upon pre-existing cognitive mechanisms (Boyer, 2000, 2007; Mesoudi & Whiten, 2008; Morin, 2016; Sperber, 1996; Sperber & Hirschfeld, 2004). Put differently, humans are not so easy to manipulate, and it is not clear that historical myths put forth by self-interested elites should be endorsed by the masses without question (Hirst & Manier, 2008; Mercier, 2017, 2020). In fact, examples of nationalist propaganda failures abound (Mercier, 2020, pp. 128–141). Supporters of secessionist movements that contest existing political boundaries typically also contest mainstream historical myths and rely on narratives that highlight their historical distinctiveness (for a review, see Coakley, 2012, pp. 94–111; Catalan and Basque nationalism in Spain: Boyd, 1997; Kanak secessionism in New Caledonia: Chappell, 1993).

In sum, the instrumentalist approach, by itself, is insufficient to explain the cultural success of historical myths. First, it fails to explain why producers find it so intuitive to produce narratives of the past when trying to mobilize the masses. Second, it does not explain why people would endorse these myths. We argue that these gaps should be filled by investigating the human cognitive mechanisms that underlie the production and reception of historical myths (Hirst & Manier, 2008). In short, we need to understand how specific features of human psychology work in order to understand what makes historical myths so appealing for producers and under what conditions they are endorsed by recipients (André et al., 2023).

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2.3. Social identity theory

To understand the psychological roots underlying individuals' belief in the continuity and longevity of their group, it might be useful to turn to one of the most influential accounts of group psychology in the social psychological literature: Social identity theory (SIT; Tajfel, Turner, Austin, & Worchel, 1979). The central tenet of SIT is that humans have a spontaneous disposition to classify the world into "in-groups" – groups to which the individual belongs and become part of their identity – and "out-groups." Because group membership can be a source of pride and self-esteem, individuals thus have a tendency to behave in ways that increase the prestige of their in-groups and, under some circumstances, degrade the reputation of the out-groups (Tajfel, 1982; Tajfel & Turner, 1986; Tajfel et al., 1979). Importantly, this psychological disposition may have implications for the spread of cultural information. In particular, SIT predicts that individuals would be more likely to endorse any type of cultural item (stories, myths, songs, etc.) that increase the prestige of the in-group (Tajfel, 1984). Hence, the SIT explanation for the cultural success of historical myths would be that people endorse these myths because they increase the prestige of their group – and, eventually, in-group members' own self-esteem.

However, this account does not address the fundamental characteristic of historical myths, which is that they are about the distant past. In particular, SIT cannot explain why notions of "ancestral origins" and a sense of shared history can play such an important role in nationalist discourse. Indeed, historical myths are more than just catalogues of past glories: Their essential characteristic is that they present the group as a perennial entity, rather than a recent construction (Anderson, 1991; Berger & Lorenz, 2016; Coakley, 2004; Smith, 1999; Thiesse, 2021). One possibility, consistent with SIT, would be that perceiving one's group as ancient and continuous in time somehow increases one's self esteem. But, just like the instrumentalist account, this explanation raises more questions than it answers: Why is it in the first place that people take pride in the deep history of their group? Why would information about the ancient history of the group matter for group members' sense of identity and solidarity?

To solve this puzzle, scholars have suggested the existence of a deeply entrenched "need for continuity" or "need for meaning" in human psychology. For instance, one of the leading scholars of nationalism – Anthony D. Smith – argued that "[b]y placing the present in the context of the past and of the community, the myth of descent interprets present social changes and collective endeavors in a manner that satisfies the drive for meaning by providing new identities that seem to be also very old" (Smith, 1999, p. 62). More recently, social psychologists have proposed a "need for self-continuity" in humans to explain the appeal of historical myths (Sani, 2010; Sani et al., 2007, 2009; Siromahov et al., 2020; Smeekes, McKeown, & Psaltis, 2017; Smeekes & Verkuyten, 2014a, 2014b, 2017). In this account, individuals develop a belief in the continuity of their group as a way to compensate for their own finitude. However, it remains unclear why exactly humans have such psychological needs in the first place – which is what we want to explain. Second, these theories connect historical myths with general existential needs for meaning making or self-continuity but do not explain why they are also related to more specific concerns about group membership – as suggested by the literature in political science. For instance, it does not explain why many governments design history curricula for compulsory mass schooling – not with a general aim to alleviate children's existential anxiety but to inculcate patriotism (Weber, 1976).

2.4. Kin altruism and imaginary kinship

The most influential psychological hypothesis that explicitly considers how historical myths may relate to group solidarity is based on the observation that they are also typically myths of common descent. The "family resemblance" between human groups and kinship networks has been extensively noted and is manifest through the use of kin terms – "brotherhood" or "motherland" – to refer to group members (Cronk et al., 2019; Horowitz, 1985; Van den Berghe, 1987). Kin altruism theory indeed predicts that relatedness should inspire strong feelings of solidarity and cooperative behaviors (Hamilton, 1964). In line with this idea, scholars often propose that human societies develop cultural techniques to instill a sense of imagined kinship and thus promote costly acts of cooperation (Atran, 2016; Whitehouse, 2018; Whitehouse & Lanman, 2014).

Relatedness, though, is unlikely to be able to explain cooperation at the scale of ethnic groups or nations. Indeed, the presumed genetic relatedness of members of the same national community is arguably so low that it should have no impact on cooperative decision making (Jones, 2018). Perceptions of relatedness cannot easily misfire either. Because the adaptive level of cooperation with close kin is very high, organisms are incentivized to pose as close relatives in order to attract resources. For this reason, research on kin recognition in human and nonhuman animals suggests that kin altruism is systematically coupled with kin recognition mechanisms that are particularly accurate at detecting fake relatives – individuals that pass as relatives to attract resources from another one (Lieberman, Tooby, & Cosmides, 2007; Park, Schaller, & Van Vugt, 2008). Kin recognition mechanisms can certainly misfire, but evidence suggests that this only happens in highly specific circumstances that very closely mimic typical kin relations – as in the case of adopted babies or children raised together in Israeli Kibbutzim (Lieberman & Lobel, 2012; Lieberman et al., 2007). Given the high costs associated with national commitment (tax compliance, civic duties, military service, etc.), it is unlikely that the mere evocation of presumed kinship ties in the form of myths of descent is sufficiently credible to substantially alter cooperative behavior at the scale of nations.

In a nutshell, the existing literature agrees that historical myths are somehow important for mass mobilization and group solidarity but fails to explain why. The exact psychological mechanisms by which information about the remote collective past becomes relevant to humans remains mysterious. In the following sections, we propose that the cultural success of historical myths is driven by the adaptive challenge of competitive coalitional recruitment. Historical myths are cultural artifacts designed to attract coalitional support, not because they suggest genetic relatedness, but because displays of a long shared history convey compelling cues of the high degree of fitness interdependence that binds group members.

3. The challenge of competitive coalitional recruitment

3.1. Fission and fusion dynamics in human coalition formation

Whether in the ancestral environment or modern times, the process of joining and forming coalitions involves high-stake

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decisions. Indeed, coalitions are highly beneficial: Organisms that pool resources for a common goal generate fitness benefits that could not be achieved individually (Cosmides & Tooby, 2010; Tooby et al., 2006). Individuals benefit from coalitional support whenever they compete for limited resources: Social status, political power, food, or mates (Redhead & von Rueden, 2021; Cosmides & Tooby, 2010). When competing for scarce resources, more numerous and organized coalitions are more likely to succeed than less efficient groups or isolated individuals (Cosmides & Tooby, 2010). Accordingly, coalitions are widely observed in human societies but also in other cooperative species like dolphins or dogs (Seyfarth & Cheney, 2012; Wiszniewski, Brown, & Möller, 2012). One comparatively unique characteristic of humans is their ability to form large-scale coalitions with unrelated strangers in the form of tribes, ethnic groups, or nations-states. Such large-scale groups can indeed be considered as coalitions, in which individual contribution mainly takes the form of paying taxes, engaging in warfare, and acting civically (Boyer, 2018; Hechter, 2000; Kroneberg & Wimmer, 2012; Wimmer, 2008, 2018).

Critically, human coalitions are not fixed: Coalitional boundaries frequently change with contextual incentives, and people may belong to more than one coalition at one time. These changes can take multiple forms, but they typically manifest in fission–fusion dynamics, with either subgroups seceding or multiple groups joining forces (De Dreu, Gross, & Romano, 2024; Horowitz, 1985, pp. 64–74). In large industrialized societies, political scientists have documented multiple cases of such large-scale ethnic boundary change. For instance, in a classic paper, David Posner observed that two ethnic groups, the Chewa and the Tumbuka, were political adversaries in Malawi, but became allies in Zambia to compete with larger ethnic competitors (Posner, 2004). Likewise, in many ethnically diverse countries, people must balance their affiliation with their ethnic group (like the Kikuyu) and with a larger national group (like Kenya). The tense relationship between concentrically organized group affiliations has been widely documented by political scientists (Fukuyama, 2018; Horowitz, 1985; Robinson, 2016). This tension is best illustrated in nation-building policies, whereby national elites attempt to secure the social support of citizens to the detriment of more local loyalties (Weber, 1976; Wimmer, 2018). For instance, when the Zionist movement first emerged in the nineteenth century, it was not successful in the diaspora. It took decades of convincing and dramatic historical events to make Jews from initially distinct communities want to engage in a joint political coalition within the Israeli state (Saadoun, 2012; Traverso, 2016).

Far from being an exclusive property of modern politics, exposure to multiple coalitional arrangements – and thus, the need to navigate multiple coalitional memberships – is an ancient feature of human social life. Humans with highly diverse subsistence modes – including hunter–gatherers – have been able to form various coalitions, including at very large scales, since the Pleistocene (Bird, Bird, Codding, & Zeanah, 2019; Boyd & Richerson, 2022; Singh & Glowacki, 2022). Ethnographic data from the Yanömamo, the Waorani, or the Inuit confirm these findings: Individuals in small-scale societies routinely shift their alliances – sometimes fragmenting and other times merging – in reaction to surrounding incentives (Burch, 2005; Chagnon, 2013; Macfarlan et al., 2018).

In sum, humans are routinely exposed to social contexts in which they must navigate highly complex coalitional landscapes that require them to optimally invest their limited resources in available coalitions – a process we call coalitional choice (Pietraszewski, 2020). Naturally, this choice is heavily constrained, especially in large-scale settings. A French citizen cannot easily choose to defect from their nation and become a dedicated Chinese citizen. Moving across group boundaries frequently involves prohibitively high transaction and coordination costs – because of linguistic barriers, cultural distance, and moving costs (Amundsen, 1985; McElreath, Boyd, & Richerson, 2003; Oh, Selmier, & Lien, 2011). Consequently, we expect the mechanisms involved in coalitional choice to be particularly active when deciding whether to splinter or to fusion into a larger group – as these processes generate much less friction and are routinely observed.

Although the human psychological mechanisms underlying coalitional behavior are probably universal, people typically vary in the type of coalition they want to see prosper. This variation has two main sources. First, individuals vary in how they assess a coalition's ability to provide fitness benefits. For instance, Europeans vary in their approval of European integration: Some suggest that building a European coalition is the only way to remain competitive in a globalized world, whereas others do not trust people beyond their national boundaries (Foster & Frieden, 2021; Kentmen, 2008; Tanasoiu & Colonescu, 2008). Second, variation can reflect the contextual selfish interests of "political entrepreneurs" who seek leadership positions (Kroneberg & Wimmer, 2012; Wimmer, 2008). For instance, marginalized local elites in multiethnic states can have an incentive to lead a secessionist or regionalist movement in order to increase their relative status (Brass, 1991; Hechter, 2000; Schneider & Teske, 1992). Although individuals differ in their view on such debates, they would all benefit from additional social support to their preferred coalition. To take an example that illustrates a recurrent pattern in modern societies, nation-builders typically need citizens to be loyal to the state, secessionists want to reawaken ethnic mobilization and, on the contrary, supranationalists want to temper down national identity (Horowitz, 1985; Wimmer, 2018). Hence, because social support is a limited rival good, people with diverse coalitional interests compete to attract social support in their most profitable coalition. This creates two complementary adaptive challenges: Individuals must not only identify which coalition is most beneficial to them, but also convince others to invest in this particular coalition (e.g., committing to the French nation) rather than to invest in a different coalition (e.g., cooperate at the scale of the European Union) (Lopez, 2020; Pietraszewski, 2020).

3.2. The psychology of coalitional choice: The decisive role of fitness interdependence

How do individuals determine whether they should invest their limited resources in a given coalition? Following a growing line of research, we argue that one of the most important factors that determine the fitness benefits of joining a coalition is the degree of fitness interdependence among group members. Positive fitness interdependence describes the degree to which the fitness of an organism is directly impacted by the fitness of other organisms (Aktipis et al., 2018; Ayers et al., 2023; Cronk et al., 2019; Roberts, 2005; Tomasello et al., 2012). This configuration occurs whenever individuals derive a direct fitness benefit from the continued existence and welfare of others. For instance, the fitness of meerkats is closely tied with the fate of other group members because the size of meerkat groups plays a crucial role in deterring

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predators – resulting in a strong incentive for meerkats to protect other group members (Clutton-Brock, 2002; Clutton-Brock et al., 1999; Kokko, Johnstone, & Clutton-Brock, 2001; Roberts, 2005).

In humans, fitness interdependence has been especially useful to explain cooperation between unrelated individuals in the context of dyadic relationships or small groups. For instance, in human mating relationships, partners are often interdependent in terms of their welfare as well as their reproductive success if they have offspring together. Similarly, in times of war, soldiers in the same unit are highly interdependent, relying on one another for protection and survival. Also, in mutual help systems, individuals share resources with their partners in times of need; this need-based transfer system makes it more likely that both partners will survive and support the other partner (for a review of relationship types that can involve a high degree of fitness interdependence, see Aktipis et al., 2018; Cronk et al., 2019, p. 284). In line with this idea, humans appear to have psychological mechanisms that allows them to detect the level of fitness interdependence they have with other individuals in their environment, and adjust their cooperative decisions accordingly (Ayers et al., 2023; Balliet & Lindström, 2023; Colnaghi et al., 2023; Columbus & Molho, 2022; Jin et al., 2024; Pleasant, 2021).

Fitness interdependence has been mostly investigated in small-scale settings (Aktipis et al., 2018; Balliet & Lindström, 2023; Cronk et al., 2019; Roberts, 2005). When coalitions are sufficiently small, the impact of fitness interdependence on the process of coalitional choice is straightforward: Individuals should be more willing to invest in a coalition if their own welfare is positively correlated with that of other members – as it increases the net fitness benefit of their cooperative action (Aktipis et al., 2018; Colnaghi et al., 2023; Jin et al., 2024; Roberts, 2005). Yet, configurations of fitness interdependence can also emerge at much larger scales: Members of a very large group can become fitness interdependent to the extent that each individual benefits from the general welfare of other group members (Baldassarri & Abascal, 2020; Cronk et al., 2019; De Dreu et al., 2024). Accordingly, humans can perceive the degree of fitness interdependence that they have not just with other individuals, but with entire groups – including large-scale ones. One important line of evidence in support of this idea comes from the literature on identity fusion. Indeed, identity fusion captures the extent to which individuals perceive their fate to be inseparable from the fate of other individuals – friends, coreligionists, war brethren, and so on – and the extent to which they feel connected by intense kin-like bonds (Swann & Buhrmester, 2015; Whitehouse, 2018). As such, identity fusion can be considered as a proximate measure for perceived fitness interdependence (Cronk & Aktipis, 2018). Tellingly, lab experiments and surveys from countries as diverse as Spain, Indonesia, and China show that individuals experience a substantial degree of identity fusion with large-scale entities such as their country or their religious community (Swann et al., 2014; see also Swann & Buhrmester, 2015). Hence, just like people can attend to individual-level cues to assess the degree of interdependence they have with individual partners in dyadic relationships, they also seem equipped with cognitive mechanisms that are able to detect coalition-level cues to assess their degree of fitness interdependence with entire groups – including large and abstract ones.

However, in contrast to its application to small-scale settings, fitness interdependence is unlikely to directly incentivize cooperation at the scale of entire nations or ethnic groups. In both cases, fitness interdependence entails that each group member has an interest in the overall welfare of other group members; but in very large groups, each individual's contribution to this general welfare is likely to be negligible. For instance, the war effort or tax contribution of one single citizen is unlikely to significantly affect the plight of other citizens in the country. In this situation as in other social dilemmas where individual contribution is diluted, group members may not have a direct interest to cooperate – despite sharing a perception of fitness interdependence (Olson, 1965; Ostrom, 1990). For this reason, predominant theories of large-scale cooperation typically emphasize cultural systems of monitoring, rewards, and punishment – usually in the form of state institutions – that incentivize cooperation with group members (Acemoglu & Robinson, 2012; Jin et al., 2024; Lienard, 2014; Ostrom, 1990; Powers & Lehmann, 2013; Powers, Van Schaik, & Lehmann, 2016). Yet, explanations that center exclusively on the role of such institutions fail to consider one fundamental point: To be efficient and maintain themselves in the long run, they must be perceived by participants as mutually beneficial arrangements, in other words they must appear as *morally legitimate* (André, Fitouchi, Debove, & Baumard, 2022). When institutions are perceived as enforcing a coalitional arrangement that does not optimally benefit all citizens, they risk being perceived as irrelevant – at best – or as unfair, extractive, or oppressive (Ostrom, 1990). This happens, for instance, when secessionist movements or colonized social groups reject existing state institutions, hoping to establish new institutions encompassing different coalitional boundaries that are perceived to enforce a more mutually beneficial coalitional arrangement – typically, in the form of a new independent sovereign state (Horowitz, 1985; Wimmer, 2018). Thus, when institutions are widely viewed as morally illegitimate, large-scale cooperation may fail to materialize, because individuals resist these institutions and support alternative forms of coalitional arrangements.

As a result, coalitional recruiters are strongly incentivized not just to create systems of monitoring, rewards, and punishments, but to convince their audience that the cooperative interaction these institutions seek to enforce will prove exceptionally beneficial to them. They must demonstrate to all group members that cooperation within their coalition will bring them substantial fitness benefits – provided that other members do cooperate as well. In particular, in the context of coalitional choice and competition for coalitional support, they need citizens to perceive cooperation in their coalition as the *most* mutually beneficial coalitional arrangement available to them – in order to increase their commitment to the coalition and reduce their temptation to engage in alternative forms of coalitional arrangement. For instance, French nation-builders in the nineteenth century relied heavily on state power to incentivize the masses to pay taxes and engage in war effort, but they *also* needed to convince their audience that organizing state institutions at the level of France rather than at a subregional level like Britanny, Corsica, or Provence is more mutually beneficial for the parties involved – and therefore that all French people have a personal interest to commit to this new, emerging large-scale coalitional arrangement (Weber, 1976).

We argue that one of the most important pieces of information that strategic recruiters may advertise to increase the perception that cooperation in their coalition constitutes an especially productive coalitional investment – and therefore, to achieve the commitment of citizens to their large-scale coalition – is the degree of fitness interdependence that binds all group members. Indeed, fitness interdependence entails that each individual in the coalition derives a fitness interest from the general welfare of other group members (Aktipis et al., 2018; De Dreu et al.,

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2024). As a result, the best mutual interest for individuals in this situation is one where everyone invests significant resources to maintain the welfare of other group members. Under these conditions, individuals who perceive themselves as being fitness interdependent should be more supportive of institutional arrangements that organize an extensive cooperative interaction among themselves – and prefer it to alternative arrangements where they are required to help people with whom they are not (or simply less) fitness interdependent.

Additionally, the mental representation that cooperation within a given coalition constitutes a mutually beneficial cooperative arrangement – one that would bring an optimal amount of fitness benefits to all the parties involved – should also manifest as a feeling of *moral duty* toward the coalition. Indeed, a growing body of literature in moral cognition suggests that individuals who perceive themselves as having *especially* strong fitness incentives to cooperate together should perceive themselves as having special moral obligations toward each other (André et al., 2022; McManus, Mason, & Young, 2021; Tomasello, 2020). This probably contributes to a recurrent finding in moral psychology, which is that individuals who belong to the same coalition feel that they have *special obligations* toward other group members, even in large-scale coalitions where people don't know each other (Baron, Ritov, & Greene, 2013; Cappelen, Enke, & Tungodden, 2022). For instance, most American participants expressed strong moral preferences for policies that increased the overall welfare of Americans, even if it came at the expense of global welfare (Baron et al., 2013). As a result of this psychological mechanism, perceived fitness interdependence can significantly increase the shared perception that group members – even in a very large groups – have special moral obligations toward each other. This, in turn, increases the reputational benefits that people may reap when acting for the sake of the group as well as the reputational costs of not doing so – which further contributes to the stabilization of large-scale coalitions (André et al., 2022; Baumard, André, & Sperber, 2013; Everett et al., 2021; Everett, Pizarro, & Crockett, 2016).

In sum, perceived fitness interdependence plays a structural role in the process of coalitional choice and in the emergence and stability of large-scale coalitions. When members of a large coalition perceive that they are bound by a significant degree of positive fitness interdependence, they should be more willing to invest their limited resources for the sake of other group members. First, perceived fitness interdependence increases support for a given coalitional arrangement – thus reducing temptations to secede and form alternative coalitions; second, it also increases support for the institutions of monitoring, rewards, and punishments that stabilize this coalitional arrangement, instead of rebelling against them as unfair or irrelevant; and third, by suggesting that group cooperation is a moral duty, it increases the reputational cost of not cooperating. Overall, perceived fitness interdependence is not a substitute to more traditional accounts of large-scale cooperation – which often emphasize institutional constraints and reputational pressures – but a crucial complement to some of their limitations (Acemoglu & Robinson, 2012; Barclay & Barker, 2020; Jin et al., 2024; Lienard, 2014; Ostrom, 1990; Powers & Lehmann, 2013; Powers et al., 2016; Számadó, Balliet, Giardini, Power, & Takács, 2021). Institutions do matter, but perceived fitness interdependence explains when people support them. Similarly, reputational incentives do play a decisive role in motivating cooperation in large groups, but perceived fitness interdependence explains why commitment to large and abstract groups – like ethnic groups and nations – come to emerge as a psychologically compelling moral duty in the first place.

Conversely, the decisive role of perceived fitness interdependence in large-scale coalition formation suggests that advertising high levels of fitness interdependence among group members should be an important component of large-scale coalitional recruitment strategies. By displaying cues of positive fitness interdependence among group members, strategic agents may be able to motivate their targets to invest more resources for the sake of the coalition. To do so, coalitional recruiters must come up with a wide range of strategies that aim to efficiently target their audience's social cognition. Historical myths, we argue, are an important component of the arsenal.

Our hypothesis is that historical myths are designed by strategic agents to secure the coalitional support of others by conveying compelling cues of fitness interdependence with other group members. We show that humans attend to specific types of information about the shared history of their group because they can signal information about the fitness interdependence of its members. In turn, this incentivizes individuals to produce historical myths with highly specific features to convey such cues. The specific features of historical myths – their insistence on the ancient and shared past of the nation, and on the collective experiences that group members have gone through – are thus designed to activate specific features of the human cognitive mechanisms that detect fitness interdependence.

4. Cognitive systems for detecting fitness interdependence and the design of historical myths

The central prediction of our model is that the content of historical myths is not random, but exhibits highly specific design features that make them particularly apt at advertising the high degree of fitness interdependence within a coalition. We demonstrate this claim in three steps. First, we show that humans have intuitive beliefs about group continuity that allows them to infer coalition-level traits in the present from information about the past. Second, we review evidence that human minds attend to cues of shared history to detect fitness interdependence within groups, and to decide in which coalition they want to invest their resources. Finally, we show that historical myths are remarkably well-designed to convey such cues.

4.1. Intuitive beliefs about group continuity

Because of their extensive reliance on social interactions for survival and reproduction, humans are equipped with highly specific cognitive mechanisms for reasoning about social categories (Hirschfeld, 2001, 2013; Liberman, Woodward, & Kinzler, 2017; Rhodes, 2013; Shutts & Kalish, 2021). One remarkable feature of human social categorization is the intuitive belief in the temporal continuity of groups. Indeed, humans find it intuitive to speak of collective entities as having a past and a future – that is, an existence outside of the population composing the group at a particular time (Gil-White, 2001; Sani et al., 2007; Tooby et al., 2006). Importantly, people do not merely believe that groups have a continuous existence in time, but that this is also the case for group-level traits – for instance, that the prevailing values and customs in a given country are part of its temporally stable properties (Gil-White, 2001; Obradović & Howarth, 2018; Roth, Huber, Juenger, & Liu, 2017; Sani et al., 2007, 2009; Siromahov et al., 2020; Smeekes et al., 2018; Smeekes & Verkuyten, 2014a, 2014b,

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2017). In line with this idea, psychometric studies on a wide range of samples consistently find that most individuals indeed view their nation as a permanent entity with transcendent group-level characteristics (Jetten & Wohl, 2012; Sani et al., 2007, 2009; Siromahov et al., 2020; Smeekes et al., 2018; Smeekes & Verkuyten, 2014a, 2014b, 2017; Warner et al., 2016).

To some extent, this cognitive disposition certainly has an adaptive value. Indeed, many group-level traits tend to persist over substantial periods of time, including in large-scale groups. As documented by a growing body of literature in economic history, many historical contingencies generate path dependencies that can durably affect the social norms, political institutions, and cultural traits of a society for centuries or more (Giuliano & Nunn, 2021; Nunn, 2020; Robinson & Acemoglu, 2012). Remarkably, such path dependencies can also affect patterns of cooperation within groups. For instance, econometric studies show that countries with an older history of state centralization tend to have higher levels of public goods provision and more inclusive political institutions (Wimmer, 2018). Likewise, ethnic groups in Africa that have experienced more raids during the transatlantic slave trade centuries ago still report lower levels of social trust to this day (Nunn & Wantchekon, 2011). These results are consistent with theoretical work in the field of cultural evolution. Indeed, the persistence of cultural traits within a group over a very long time can result from many aspects of cultural evolutionary dynamics, such as environmental stability, conformist bias in cultural transmission, and technological accumulation (Comin, Easterly, & Gong, 2010; Gil-White, 2001; Giuliano & Nunn, 2021; Nunn, 2020; Spolaore & Wacziarg, 2013). Just like any adaptive psychological mechanism, intuitions about group continuity can occasionally generate inaccurate beliefs. However, in many cases, paying attention to the deep history of a group can actually provide important information about its characteristics in the present – which probably explains why this intuition appears so psychologically compelling (Smeekes et al., 2017).

This cognitive disposition explains why beliefs about group continuity – for instance, that the French population in 2022 and the population living in the same territory in 500 AD share similar attributes because of some invisible permanence – can appear intuitive instead of being rejected as preposterous (Smeekes et al., 2017). Because humans intuitively think of groups as having time-enduring properties, historical events that affected some group-level trait in the past – for instance, an important war that has brought country members together – can be perceived as having an enduring impact in the present. In fact, the typical structure of historical myths reflects this intuition, as they portray some historical events in the remote past as defining the trajectory of a group for a very long time (Liu & Hilton, 2005; Smith, 1999). For instance, Serbian nationalists portray the battle of Kosovo as a foundational moment in the development of a Serbian national identity, not just in the Middle Ages but to this day (Lomonosov, 2021; Malešević, 2022). As a result of this intuitive disposition, information about historical events that could have increased fitness interdependence among group members in the past can be perceived as having durable consequences for a very long time, especially if such events are not isolated but are frequent.

Our hypothesis is that strategic individuals can take advantage of such beliefs to produce and transmit historical myths for self-interested coalitional recruitment purposes. In particular, intuitive beliefs about group continuity make historical myths especially well-suited to activate specific cognitive mechanisms for detecting fitness interdependence among group members.

4.2. Cognitive mechanisms for detecting fitness interdependence

One of the most important drivers of fitness interdependence among nonkin is a history of repeated interactions. Recent evolutionary models show that recurrent and positive interactions between social partners are not only stabilized by the *reciprocity* mechanism, but also by an additional mechanism: Fitness interdependence (Barclay, 2020; Tooby & Cosmides, 1996). Individuals are highly incentivized to help a frequent reciprocator, such as a friend or recurrent business partner, to maintain their ability to pursue the reciprocal relationship in the future (Barclay, 2020).

Many parameters can influence the level of interdependence that binds individuals in such recurrent reciprocal exchanges. Of particular importance is the parameter of irreplaceability: Individuals have a greater stake in the welfare of a recurrent cooperation partner when this person is harder to replace by another equivalent partner (Barclay, 2020; Tooby & Cosmides, 1996). Conversely, if an individual can easily replace a recurrent cooperation partner by an equivalent one, it may become less costly to shift partners than to help the endangered one. This explains why individuals attend to cues that signal a partner's irreplaceability and typically engage in various strategies to make themselves irreplaceable to their cooperation partners (Tooby & Cosmides, 1996).

The irreplaceability of partners engaged in reciprocal relationships over time can result from a variety of mechanisms. Most importantly, the *duration and frequency* of the reciprocal relationship itself can make partners harder to replace. Indeed, as individuals repeatedly cooperate over time, they increase their ability to coordinate efficiently – a phenomenon that has been observed in a variety of contexts. In particular, studies in organizational psychology show that teams with members who have more experience working together are more performant (Dubnicki & Limburg, 1991; Goodman & Leyden, 1991; Guzzo & Dickson, 1996; Jehn & Shah, 1997; Shah & Jehn, 1993; Watson, Michaelsen, & Sharp, 1991). For instance, Watson et al. (1991) showed that the extent to which groups of students were more performant on a standardized assignment than individual members in isolation increased with the time spent in this group. Similarly, participants who reported being close friends performed better in collective tasks than mere acquaintances (Jehn & Shah, 1997; Shah & Jehn, 1993). Interestingly, the better performance of close friends was in substantial part mediated by increased interpersonal communication – which suggests an important role of coordination gains. As a result, individuals with a longer history of cooperation are more irreplaceable to one another, because finding a new partner would require to build up all of the acquired coordination gains from zero, which arguably increases the cost of this strategy (Shah & Jehn, 1993).

In addition, the duration and frequency of a reciprocal relationship also allows for the development of a "raise-the-stake" cooperation strategy. Indeed, although classical evolutionary models for the evolution of cooperation only considered two behavioral options – cooperation and defection (Axelrod & Hamilton, 1984), more recent scholarship rely on more realistic models, where individuals do not merely choose whether to

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cooperate or not, but *how much* they want to cooperate (Roberts & Sherratt, 1998). In such configurations, one especially efficient strategy to maximize the fitness benefits from cooperation without risking too much exploitation is to start cooperating with small amounts of resources and gradually increase them as long as the partner reciprocates the offers (Roberts & Sherratt, 1998). This strategy allows individuals to "test the waters" before engaging in costlier forms of cooperation. Lab experiments confirm the overall logic of this model: When individuals are given the option of choosing the amount of resources they want to engage in a repeated cooperative game, their typical strategy is to gradually increase their contributions over rounds (Kurzban, McCabe, Smith, & Wilson, 2001; Kurzban, Rigdon, & Wilson, 2008; Majolo et al., 2006; Roberts & Renwick, 2003; Van den Bergh & Dewitte, 2006). Just like coordination gains, the ability of such "raise-the-stake" strategies to increase the level of cooperation that individuals can achieve makes partners with a longer history of cooperation more irreplaceable to one another – and, consequently, more fitness interdependent. Shifting partners would require to build up the gains from the "raise-the-stake" strategy all over again – at a considerable cost.

Evolutionary models of fitness interdependence usually focus on dyadic relationships, but the same dynamics can occur at much larger scales (Aktipis et al., 2018; Barclay, 2020; Cronk et al., 2019; De Dreu et al., 2024; Gross et al., 2023). Just like in dyadic relationships, large groups where individuals have a long history of fruitful social exchanges develop significant gains in coordination, efficiency, and trust that make group members more irreplaceable to each other – increasing their fitness interdependence. The perceived fitness interdependence that emerges from learning about one's group shared history signals to recipients that their group constitutes the *best possible coalitional* arrangement available to them (André et al., 2022). As a result, information about shared history should promote group members' sense of moral duty toward the group, and their commitment to coalitional boundaries and the institutions that establish them (see sect. 3.2).

In line with this idea, repeated interactions increase willingness to cooperate even when they occur at the scale of large groups. For instance, a behavioral experiment shows that as individuals cooperate across group boundaries, they become less prejudiced against out-groups and more likely to cooperate with them – even when the groups are quite large ($n = 128$ per group) (Gross et al., 2023). Hence, even when individuals do not all interact face-to-face, the mere fact of repeatedly engaging in a group-wide collective action establishes strong ties among them (De Dreu et al., 2024). More generally, an important literature on intergroup contact suggests that individuals who are made to interact across group boundaries are less prejudiced toward out-groups in general – and not just toward the particular out-group individuals they interacted with (for a review, see Paluck, Green, & Green, 2019; Paluck, Porat, Clark, & Green, 2021). Even at the very large scale of entire nation-states, policies that stimulate intense interactions between citizens from all over the country were found to significantly increase the national commitment of targets (Bazzi, Gaduh, Rothenberg, & Wong, 2019; Cáceres-Delpiano, De Moragas, Facchini, & González, 2021; Okunogbe, 2018; for a review, see Rohner & Zhuravskaya, 2023). For instance, Spanish individuals from regions with weak Spanish identity (e.g., Basques, Catalans, etc.) who were randomly assigned to perform their military service outside of their region – and thus, had the opportunity to interact with Spanish people from all over the country – increased their self-reported identity as Spanish (Cáceres-Delpiano et al., 2021).

In sum, all these findings converge to paint a consistent picture of an important aspect of the human social cognition. Evolutionary models suggest that individuals become more fitness interdependent when they have a history of positive reciprocal relationships, and this effect is amplified when this history is such that it makes it costlier to shift partners. This mechanism can explain the development of fitness interdependence in a simple dyadic relationship, but also in much wider social networks. As a result, individuals are endowed with psychological mechanisms that track ecologically relevant cues of relationship duration, frequency, and intensity. Consequently, individuals exposed to cues that they have been engaged in repeated, long, and intense forms of cooperative exchanges should perceive themselves as highly fitness interdependent. As a result, perceived fitness interdependence in large coalitions should make people more willing to engage in high-stake cooperation in the future – by increasing the stability of institutions and the moral reputation that people can derive from helping group members (see sect. 3.2). In turn, these cognitive mechanisms can interact with humans' intuitive beliefs about group continuity. Indeed, because humans intuitively conceive their group as having time-enduring properties, any fitness interdependence gain acquired from an episode of interactions is assumed to persist over the next generations. As a result, information about the shared history of a group – even when it involves generations of group members over centuries – can be perceived as a reliable cue to infer the degree of fitness interdependence that binds group members.

4.3. The design of historical myths

In light of these findings, historical myths are particularly well-designed to convey cues of fitness interdependence through repeated interaction. By definition, historical myths present the shared and distinct historical experience of a group: Its ancient origins and the succession of important events it has been through (Berger, 2009; Berger & Lorenz, 2016; Coakley, 2004; Smith, 1984, 1999). Importantly, this shared history is assumed to be ancient and continuous (Coakley, 2004; Hobsbawm & Ranger, 1983; Smith, 1999; Thiesse, 2021). These features are considered fundamental to national cohesion by the elites that typically contribute to spread them. Historians frequently note that many apparently immemorial national traditions were in fact recently "invented" with the clear aim of "establishing or symbolizing social cohesion or the membership of groups, real or artificial communities" (Hobsbawm & Ranger, 1983, p. 9).

As an example, the consolidation of nineteenth-century European nation-states required elites to convince the masses to become committed national citizens – and made extensive use of historical myths to do so (Hobsbawm & Ranger, 1983). State officials and elites devised new historical narratives that "placed great emphasis on the origins of the nation" and were "intended to retrace the continuity of a collective body through the ages, from its ancient founders to the present" (Thiesse, 2007, p. 20). Importantly, the production of historical myths was driven by the widespread perception that "[what] made the nation was a sense of sharing the same collective history" (Thiesse, 2007, p. 16). Similarly, historical myths were a fundamental part of the nationalist movements in post-Soviet states (Kuzio, 2002a, pp. 251–254). In these countries, "historians [were] tasked by the ruling elites to claim the right of the indigenous population

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the privilege of possessing a separate history" (Kuzio, 2002a, p. 247). In particular, Ukrainian nationalist rhetoric relied heavily on the claim that post-Soviet Ukraine was not a recent invention but rather the continuation of a "1000-year tradition" of statehood (Kuzio, 2002a). The ancient origins of the Ukrainian state was emphasized to advertise the deep roots of Ukrainian cohesion: "Ukrainians were never an inert mass – but 'always striving towards liberation and independence'" (Kuzio, 2002b, p. 209).

The perceived importance of historical myths in fostering group cohesion is not confined to the European continent (for an overview, see Fig. 1). For instance, in Syria, a government decree in 1947 defined the role of history as being "to strengthen the nationalist and patriotic sentiments in the hearts of the people … because the knowledge of the nation's past is one of the most important incentives to patriotic behaviour" (Lewis, 1975, p. 65). Similarly, southeast Asian nationalist movements relied heavily on historical myths for nation-building purposes in the second half of the twentieth century (Salem-Gervais & Metro, 2012; Suryadinata, 2014). For instance, Burmese nationalist leaders "[attempted] to project 'Myanmar' identity backward into ancient history" (Salem-Gervais & Metro, 2012, p. 47). Specifically, they celebrated the fact that Burmese people from all ethnic groups had been unified and had lived together since the Pagan Empire – which was founded in the ninth century – and downplayed all historical events that may have signaled disunity among Burmese people. As one official textbook emphasized: "In Pagan era, all the indigenous groups/national races Pyus, Mons, Palaungs, Karens, Taugthus, Thets, Chins, Arakanese, Burmans, Shans etc., united with solidarity to build a Myanmar nation. They lived in harmony" (Salem-Gervais & Metro, 2012). Historical myths are also prevalent in many ethnic groups across the world (Clark & Coe, 2021; Horowitz, 1977, 1985; Wiessner, 2018). For instance, among the Yoruba – one of the most numerous ethnic groups in Nigeria –, "[group] consciousness … was mainly created by invoking historical links" among group members (Ajala, 2009, p. 1) and Yoruba leaders explicitly used a "mythological history of origin … to establish a pan-Yoruba identity" (Ajala, 2009, p. 10).

In all these situations, coalitional recruiters insist not only on the fact that their audience would stand to gain from joining forces, but also on the fact that the group has existed as a cohesive entity for a very long time. Why such an insistence on the collective past? Our account suggests an answer: Historical myths show that group members have a remarkably long history of cooperation. The ancestral origins of the group demonstrate that the cohesion that coalitional recruiters ask from their audience is not an ex-nihilo creation, but dates back to centuries or even millennia. And its continuous history, marked by a succession of major collective experiences, shows that group members have been interacting together, solving problems and overcoming challenges for a very long time. As a result of these features, historical myths can compellingly activate the human cognitive mechanisms for detecting fitness interdependence from repeated interactions. Just like two friends with a long history of cooperative interactions become irreplaceable to each other, members of a group with a 1,000-year-old history of cooperative interactions can be perceived as highly interdependent, increasing one's motivation to invest in this particular coalition (Barclay, 2020).

This perspective on historical myths explains their core features, but can also shed light on some puzzling aspects of their manifestation. First, our account can explain why the notion of shared ancestry is considered as such an important component of group cohesion – especially in societies where ethnicity constitutes an important social divide (Clark & Coe, 2021; Gil-White, 2005). As many anthropologists have noted, myths of the past are often myths of ancestry – sometimes even genealogies (Van den Berghe, 1987; Wiessner, 1998). One possibility is that the rhetoric of shared ancestry is produced to evoke actual genetic relatedness. However, again, it is unlikely that human kin detectors could be easily fooled by cheap verbal relabeling. A more parsimonious explanation is that shared ancestry is but a narrative device that roots the group in a deep past and starts a chain of repeated interactions. Emphasizing a comprehensive shared historical narrative rather than shared ancestry alone can be particularly useful to instill a sense of fictive kinship in populations that already believe in distinct sets of ancestors. For instance, over the twentieth century, Chinese state propaganda has rewritten the official history of non-Han ethnic groups in favor of a narrative "in which the Uyghurs had been a member of the great family of the Chinese nation, and Xinjiang had been party of China since ancient times" (Bovingdon, 2001, p. 97). Similarly, early Mexican nationalists who sought to rally indigenous populations to a nation dominated by Europeans crafted a narrative of a "Mestizo country" founded upon the shared history of both people (Gutiärrez, 1999; see also similar historical myths in Peru: Molinié, 2004; and in Ecuador: Foote, 2010). In such cases, the use of kin terms most likely reflects computations of fitness interdependence than actual genetic relatedness (Cronk et al., 2019).

Second, our account explains why historical myths are so often inaccurate and contested by profession historians (Hobsbawm & Ranger, 1983). Indeed, our theoretical framework suggests that veracity is not the main force driving the cultural evolution of historical myths. People do not spread historical myths because they are true, but because they perceive that spreading them would benefit them, as they would motivate others to be more committed to the coalition. This explains why historical myths are often wrong, but in a predictable way: They will tend to exaggerate the ancestry and historical continuities of the group even when these claims are not warranted. For instance, although most historians argue that current nation-states are recent political constructions, dating back from the eighteenth, nineteenth, or twentieth century, nationalist ideology tends to reject this idea (Hobsbawm, 1992, 2021; Hobsbawm & Ranger, 1983; for experimental evidence, see Smeekes & Verkuyten, 2017). In fact, ancestry and continuity appear to be one of the most important grounds on which historians typically contest historical myths (Hobsbawm & Ranger, 1983).

However, this does not mean that historical truth plays no role in the elaboration of historical myths. Indeed, coalitional recruiters must craft historical myths that are sufficiently credible to bypass the epistemic vigilance of their audience while still achieving their coalitional objective – and must therefore exploit available historical information (Mercier, 2020). The need for credibility explains why elites typically emphasize visible historical and archeological evidence – ruins, ancient monuments, and so on – in support of historical myths (for instance, see Athanassopoulos, 2002; Bernhardsson, 2006). For instance, French nationalists are probably more credible when they claim a filiation with the Gauls – a people that did exist and whose existence can be easily verified – than if they claimed descent from an imaginary people (Dietler, 1994; Thiesse, 2021). In sum, the combination of inaccuracies and kernels of truth in historical myths reflects the tension between the strategic intentions of producers and the epistemic vigilance of receivers (for a similar point

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made on the cultural evolution of religion, see Fitouchi & Singh, 2022).

5. Explaining variations in the prevalence and content of historical myths

In this section, we show that this framework explains, not only the design features of historical myth, but also important patterns in the cross-cultural prevalence, interindividual distribution, and particular content of historical myths. In particular, because of the high diversity of coalitional preferences in a population, historical myths should be highly variable across periods, social groups, and cultural contexts – but in a predictable way, and across well-defined dimensions.

5.1. Variability in the prevalence of historical myths

5.1.1. Historical myth should be more important in larger populations

Across human societies, being able to rely on social support in time of needs or conflict is fundamental for survival and reproduction (Redhead & von Rueden, 2021; Cosmides & Tooby, 2010). Yet, the most efficient strategy for building social support probably varies with group size and social organization. In most small-scale societies, coalition formation results as a consequence of people identifying individuals who are high-status, generous, and with whom they share real or affinal kinship ties – and siding with them (Glowacki et al., 2016; Macfarlan, Walker, Flinn, & Chagnon, 2014; Macfarlan et al., 2018; Mathew, 2022; Redhead & von Rueden, 2021). To build coalitions in such contexts, individuals who seek social support may simply attend to and advertise individual-level cues signaling partner desirability (Mathew, 2022). In some societies, the concept of a tightly defined "in-group," with clear rules identifying members from nonmembers, may not even be appropriate. Social networks resemble more a dense web of individuals engaged in various forms of dyadic relationships, some close, some geographically afar (Bird et al., 2019).

As societies grow in scale, coalition building raises new challenges – especially when coalitions are so large that members never meet. This is characteristic of nation-states (Anderson, 1991), but may be extended to ethnic groups and large tribes that engage in large-scale collective actions. Such coalitions are more abstract, less tied to identifiable individuals, and therefore more difficult to evaluate based on the observation of individual-level cues. Recruiters and choosers need new types of displays that are easy to process and to spread. To facilitate the computation of coalitional affiliation, recruiters may display the coalition as a single entity distinct from the individuals it comprises – "the People," "the Nation," "the Clan" – which can then be attributed to traits that signal this entity's quality (Tooby et al., 2006). Although small-scale settings incentivize recruiters to highlight their individual qualities, large-scale settings with more anonymous coalitions require them to display their coalition as an abstract entity and signal its desirable qualities. It is only in the latter case that historical myths become useful, as they can convey information about coalition-level qualities in a highly intuitive format.

Consequently, we expect historical myths to be, all else equal, more prevalent in social organizations sufficiently large to allow for coalitions that may include members who never meet. This prediction seems to fit with ethnographic observation. Historical myths that portray the group as having ancient roots are widespread in nation-states and ethnic groups – which explains why they have been mostly studied in this context (see Fig. 1 for a review). Likewise, myths of shared ancestry, which describe in detail the deep genealogy of a group, appear to be especially prevalent in large agricultural groups like the Yoruba of Nigeria or the Iban of Borneo (Clark & Coe, 2021; Lloyd, 1955). Conversely, historical narratives play a more marginal role in smaller-scale forager societies, such as the Tsimane of the Bolivian Amazon or the !Kung of the Kalahari desert (Polly Wiessner & Anne Pisor, personal communication, June 2022; Wiessner, 2018). Future research could test this prediction with systematic, cross-cultural data.

5.1.2. Historical myths should be more important when people have more coalitional opportunities

Partner choice models suggest that individuals should be choosier when choosiness can yield fitness benefits that outweigh the costs. In particular, choosiness should increase when alternatives are present, when these alternatives have a high variance in quality, and when these alternatives are accessible at a low cost (Barclay, 2013, 2016; Kokko, Brooks, Jennions, & Morley, 2003; McNamara, Barta, Fromhage, & Houston, 2008). These predictions have been widely investigated and validated – especially in the domain of mate choice. For instance, women and men with high mating value can access more desirable mating opportunities and thus express a greater degree of choosiness (Arnocky, 2018; Buss & Shackelford, 2008; Fales et al., 2016). In return, choosiness in a population incentivizes recruiters to invest more effort in advertising their qualities.

Arguably, the same logic may apply to coalitional choice (Pietraszewski, 2020). Exposure to attractive opportunities for fission or fusion should increase people's coalitional choosiness, thus incentivizing recruiters to advertise their coalition more. Psychological research on coalitional choosiness remains limited, but mounting evidence suggests that individuals are particularly apt at detecting the relative desirability and status of their group compared to that of rivals, and can therefore react with appropriate behavioral and cultural strategies – especially when observing that one's own coalition is losing support (Boyer, Firat, & van Leeuwen, 2015; Cikara, Fouka, & Tabellini, 2022; Raihani & Bell, 2019).

Therefore, we expect historical myths to be more prevalent in societies where an attractive fission or fusion opportunity is made salient. A typical instance of such dynamics occurs in situations where a particular subgroup is losing coalitional support because of assimilation in a wider group. In such contexts, local elites tend to "emphasize the history of separatedness and even hostility between the groups" to counteract "the danger of a fading group identity" (Horowitz, 1985, p. 72). Throughout the twentieth century, the resurgence of distinctive historical narratives to curb coalitional loss has been repeatedly observed by political scientists in populations as diverse as Kurds undergoing Arabization in Iraq, Basques rallying integration with the Spanish, and the Fang of Gabon experiencing internal fragmentation (for a review, see Horowitz, 1977; Wimmer, 2008, pp. 1031–1037). This idea is supported by experimental evidence. Lab studies show that when exposed to vignettes describing the dilution of the Netherlands in a wider European political union – a cue signaling the existence of an attractive fusion opportunity – Dutch participants react by expressing significantly stronger beliefs in the ancestral continuity of the Dutch nation (Smeekes & Verkuyten, 2013, see especially study 3). Individuals appear to react similarly to the threat of a potential fission opportunity. Indeed, participants who perceive Muslim immigration as more threatening for the future

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continuity of the Netherlands are significantly more likely to express the belief in the ancestral continuity of their nation (Smeekes & Verkuyten, 2014a, 2014b). These results strongly suggest that historical myths can be readily deployed as a response to the threat of losing members to an attractive fusion or fission opportunity.

5.1.3. Historical myths should be more important when coalitions need more costly investments

Our main hypothesis posits that historical myths are designed to compete for coalitional investments. Consequently, they should be more prevalent in contexts where the need for committed social support increases. Perhaps the most paradigmatic context in which this may occur is large-scale war effort. Indeed, modern warfare typically involves a significant increase in taxation and requires a substantial portion of the population to sacrifice themselves or their kin in battle (Gat, 2008; Karaman & Pamuk, 2013, pp. 607–608). Hence, warfare is particularly costly and should incentivize coalition members to produce historical narratives that can mobilize the population. Historians have documented similar processes across societies. For instance, a new surge of nationalist rhetoric, including myths of a shared past, occurred in China under the threat of Japanese invasion in Manchuria – with the explicit intention to use these myths as propaganda to mobilize the masses for war (Leibold, 2006). Accordingly, psychological evidence shows that exposing participants to group continuity threats – that is, to vignettes describing the disappearance of their group – increases their belief in the ancestral continuity of their nation (Smeekes & Verkuyten, 2013, see especially study 2; for an overview, see Smeekes & Verkuyten, 2017, pp. 175–181). Likewise, experimentally induced mortality salience has been found to increase participants' belief in their group's ancestral continuity (Sani et al., 2009). One interpretation is that exposure to threat cues increases people's willingness to believe in and transmit historical myths – including information about the group's ancestral continuity – in an attempt to motivate other members to engage in cooperation to combat this threat.

5.2. Variability in the content of historical myths: Why narrative wars?

Our framework also predicts consistent and predictable variability in the content of historical myths. Indeed, because individuals do not share the same coalitional incentives, they support different coalitional boundaries. One major source of variability in boundary preferences is likely to be the perception of unequal treatment of group members. Members of a social group who share a belief that they are treated unfairly may support secession from the majority group, whereas the latter would benefit from maintaining the union. This situation describes most anticolonial conflicts and the claims of many secessionist movements (see, for instance, Elias & Franco-Guillén, 2021; Giuliano, 2015) –, and is supported by quantitative evidence. Using a dataset including representative samples from 123 countries, one study found that members of ethnic groups that were less represented in political institutions expressed less pride in their nation – a common measure of national affiliation (Wimmer, 2017; see also Wimmer, 2018). Likewise, other econometric studies show that discriminated groups identify less with their nation and sometimes more with their subgroup (Abdelgadir & Fouka, 2020; Dehdari & Gehring, 2022; Fouka, 2020; Green, 2020). These results show that coalitional preferences indeed vary and that a major driver of variability is the perception of social and political exclusion. This fits with our view of coalitional choice psychology: Excluded members observe that they have little to gain from investing in their current coalition and may find it more profitable to create a coalition of their own.

Consequently, we expect variations in the particular content of historical myths across countries, social groups, and historical periods and is not random but reflects pre-existing salient group affiliations or divides. In a New Zealand survey that asked participants which elements of history should be taught in schools, Māori participants gave more weight to their distinct ethnic past and to Polynesian compared to European history than White participants; and they were more likely to recall historical events predating the arrival of Europeans – thus reflecting the tense relationship between these two communities (Liu, Wilson, McClure, & Higgins, 1999). Interestingly, historical myths vary across ethnic groups only in contexts where ethnic divides are more salient than national affiliation. In line with this idea, in both Singapore and Malaysia, national identity is very high among all ethnic subgroups; and ethnic and national identity measures are positively correlated – suggesting that nationality, not ethnicity, may be the relevant coalitional boundary in this context (Liu, Lawrence, Ward, & Abraham, 2002). Consequently, survey data in these two countries find no significant difference in social representations of history across ethnicities (Liu et al., 2002). Hence, historical myth endorsement is not predicted by a blind ethnic preference or a mere preference for cultural familiarity, but by the most salient coalitional divides in one's environment.

One major way in which historical myths can establish their distinctiveness and clarify the type of boundaries that they advertise is by emphasizing some distinctive cultural marker. For instance, in many Western countries, xenophobic individuals tend to endorse historical myths that emphasize the whiteness and Christian roots of their nation whereas individuals who are willing to accept culturally diverse immigrants tend to highlight the historical contribution of immigrants and foreigners to their nation (Moran, 2011; Schildkraut, 2007; Smith, 2012). This idea is supported by quantitative evidence showing that religious Americans are more likely to situate the foundation of America in early religious settlements – emphasizing the religious roots of America; but secular Americans tend to situate it at independence – reflecting deep differences in the perception of the cultural markers that define Americanness (Yamashiro, Van Engen, & Roediger, 2022). Similarly, reflecting the fact that conservative Americans report narrower moral circles (Waytz, Iver, Young, Haidt, & Graham, 2019), results from the quantitative content analysis of Texan history textbooks show that more conservative counties tend to purchase textbooks with less representation of women and Black people (Lucy, Demszky, Bromley, & Jurafsky, 2020).

6. Discussion and concluding remarks

6.1. Implications for the literature on nationalism

One fundamental contribution of our model is that we root the evolution of historical myths – and more generally of nation-building technologies – in individual cognition. Consequently, we can make predictions about individuals' intuitions about these technologies, not only about their prevalence and distribution at the aggregate level. This is in stark contrast to the standard

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elite-centered "instrumentalist" accounts of nationalism, which typically argue that nationalism "does not have very deep roots in human psyche" (Gellner, 2006, p. 34). Indeed, we predict that most people, not just elites and governments, have strong psychological dispositions to endorse and transmit information if they perceive that it benefits their coalitional interests – and that these dispositions guide the cultural evolution of nationalist cultural technologies like historical myths.

Relatedly, our framework also departs from standard instrumentalist accounts in showing that individuals do not passively absorb the historical myths they are exposed to. Indeed, many social scientists suggest that historical narratives – in particular, as they were taught in compulsory public schools – have played a crucial role in spreading national consciousness in the population (Anderson, 1991; Berger & Lorenz, 2016; Hobsbawm, 2012; Weber, 1976). Yet, this claim is often based on correlational observations, raising doubts on the existence of a causal relationship. Although historical myths are probably intuitive to produce, can they effectively recruit new members or prevent current members from seceding? Our framework suggests that it may be possible in theory. Other things being equal, if the source is perceived as sufficiently credible, information about a shared history will increase targets' willingness to invest in the target coalition (Mercier, 2011, 2017; Sperber et al., 2010).

However, in practice, individuals are not solely exposed to historical myths produced by other people or their leaders: They can also observe cues in their environment that provide current information about how profitable a given coalition is to them. For instance, members of a marginalized subgroup may very well be exposed to government propaganda boasting the ancestral past, while still observing that they are oppressed by the dominant majority. In the face of such obvious cues that investing in a coalition would not be profitable, noncongruent historical myths are likely to be simply disregarded. A similar scenario seems to be currently unfolding in the Russian invasion of Ukraine. Although the Russian government publicly emphasizes the ancient shared past of Russians and Ukrainians, the latter are simultaneously exposed to cues of hostility and aggression on the part of Russian troops. In this context, it is unlikely that the historical myths of Putin's propaganda have any impact on Ukrainians who wish to remain independent – although it may appeal to those who do favor reunification with Russia (Gerber & Zavisca, 2016). In fact, as historians have long noted, many Ukrainians actually emphasize the historical distinctiveness of their nation and its foreignness to Russian cultural influence (Kappeler, 2014; Kuzio, 2002b, 2018; Metreveli, 2019; Smith, Law, Wilson, Allworth, & Bohr, 1998; Tolz, 2002). Accordingly, quantitative studies fail to find consistent evidence of a significant effect of historical propaganda on patriotic attitudes. For instance, the use of historical myths by the Chinese Communist Party has been found to have only very limited effects on Chinese nationalist attitudes (Qian, Xu, & Chen, 2017). Similarly, exposure to the public commemorations of national martyrs has mixed effects on nationalism among Israeli Jews (Ariely, 2017, 2019).

In sum, the persistence of narrative wars strongly suggests that, other things being equal, historical myths typically track, but do not change coalitional preferences. Top-down nation-building endeavors has indeed proven to be highly successful in many countries, but this success might be better explained by individuals' perception that they actually stand to gain from committing to the nation than by passive indoctrination. Historical myths are probably most useful when accompanied by credible cues of coalitional profitability such as effective public goods provision and fair institutions (Wimmer, 2018).

6.2. Implications for the cultural evolution of large-scale cooperation

One of the most puzzling macro-historical trends in the social sciences is the considerable extension of the size and complexity of human cooperation. This trend is frequently described as a move from band to tribe, from tribes to the first ancestral states which themselves paved the way for large empires and contemporary nation-states (Fukuyama, 2011; Henrich, 2020; Turchin, 2016). How did distinct and sometimes hostile communities come to unite and scale-up their cooperation boundaries? State coercion certainly played a role in stabilizing large unions and securing the support of the masses, but this does not explain the genuine cooperative preferences and emotional attachment that many individuals hold toward their "imagined community" (Anderson, 1991; for quantitative evidence, see Baron et al., 2013; Romano, Balliet, Yamagishi, & Liu, 2017; Romano, Sutter, Liu, Yamagishi, & Balliet, 2021).

Most social scientists agree that large-scale cooperation relies not only on sanctioning institutions but on a range of cultural technologies that instill patriotic preferences in people's minds. In hunter–gatherer, horticulturalist and agricultural societies, anthropologists have traditionally focused on the role of religion, rituals, or age-set systems (Glowacki, 2020; Norenzayan et al., 2016; Whitehouse, 2018), whereas historians and political scientists studying industrialized nation-states typically point to the role of government propaganda, compulsory mass schooling, and military service (for a seminal work, see Weber, 1976; for quantitative studies, see, for instance, Blouin & Mukand, 2019; Cáceres-Delpiano et al., 2021). Yet, it remains unclear exactly how these cultural technologies of large-scale cooperation came to be.

A recurrent claim in the anthropological and psychological literature is that cultural technologies of large-scale cooperation evolved through a process of cultural group selection. In this account, human groups with more efficient such technologies benefit from more in-group prosociality, which allows them to out-compete less prosocial groups. Over evolutionary time, cultural technologies of large-scale cooperation thus spread – usually by conquest, reproductive differentials between groups, or intergroup transmission (Atran & Henrich, 2010; Henrich & Muthukrishna, 2021; Norenzayan et al., 2016; Richerson et al., 2016; Turchin, 2016).

By contrast, our perspective on the cultural evolution of historical myths does not require any form of group selection or functionalism. In our account, the success of historical myths relies on the folk intuitions of strategic agents who design them to achieve their objective. Just like any cultural item, the cultural evolution of historical myths can be modeled as a transmission chain, in which people craft and transmit myths to other people, who in turn discard or refine them based on subjective feedback; and finally transmit this revised version (Sperber, 1996; Sperber & Hirschfeld, 2004; see Fig. 2). At the population level, this cultural dynamic can lead to historical myths that evolve and possibly become more psychologically compelling over time, as people cumulatively improve on them based on their folk intuitions (Dubourg & Baumard, 2022; Fitouchi & Singh, 2022; Glowacki, 2020; Singh, 2022). This model of individuals who intuitively experiment, imitate, and improve on propaganda techniques

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perfectly captures the development of historical myths and other nation-building techniques during the rise of European nation-states in the eighteenth and nineteenth centuries: "A vast workshop of experimentation, lacking a coordinator but nevertheless intensely animated, opened up in Europe in the eighteenth century … [Elites] were extremely attentive to what its opposite … competitors were achieving. They hastened to adapt to their own needs any new discovery that had to do with identity, and they in turn were imitated as soon as they had thought of an improvement or an innovation" (Thiesse, 2021, pp. 2–3).

Importantly, in contrast to the predictions of cultural group selection models, our framework does not require that cultural technologies be systematically group functional. The first reason is that, although the field of cultural evolution has traditionally emphasized the psychological mechanisms involved in the reception of culture, our approach highlights the importance of considering the producer's point of view (André et al., 2023; Dubourg & Baumard, 2022; Fitouchi, André, & Baumard, 2023). As in the case of historical myths, cultural traits may spread when a large number of people perceive that it may influence others' behavior in a way that benefits their fitness (Glowacki, 2020; Singh et al., 2017). Hence, the evolution of cultural technologies is often driven by the folk intuitions that producers have about their targets' behavior. For instance, psychologists have long investigated the cognitive biases that make humans susceptible to believe in invisible agents that punish antisocial behavior, but the cultural success of supernatural punishment beliefs is also driven by the intuitive theories of individuals with an interest in making others more cooperative (Fitouchi & Singh, 2022).

Critically, it is enough that people believe in the efficacy of a cultural technology to explain its success – without having to assume that their folk intuitions are indeed accurate. The cultural success of historical myths does not require that they are effective in shifting coalitional preferences – and in fact routinely fail to do so (see sect. 6.1). Recent work suggests that a similar cultural evolutionary process underlies the cultural success of puritanical beliefs: Across many societies, people morally condemn harmless behaviors – for example, masturbation – based on folk intuitions about self-control depletion (Fitouchi et al., 2023). If a sufficient number of people believe that puritanical norms (or historical myths) can generate a fitness benefit for themselves by influencing the self-control (or the coalitional psychology) of others, these beliefs will become culturally successful, whether or not they have any effect at all.

Lastly, our framework actually predicts that cultural technologies of large-scale cooperation should not be group functional under certain circumstances. Indeed, the production of cultural artifacts designed to influence the behavior of others can be either prosocial or selfish (André et al., 2023; Glowacki, 2020; Singh et al., 2017). The production of historical myths can be considered a prosocial behavior if the interests of the producer are aligned with that of the recipient – for instance, if the recipient would indeed benefit from being recruited in the producer's coalition (André et al., 2023). Yet, in large-scale complex societies with high power asymmetries, the production of historical myths is often a selfish behavior, by which self-interested individuals seek to manipulate others to their profit, at a cost to recipients. For instance, historical myths – and nationalist rhetoric more generally – can be crafted by elites to convince oppressed individuals to remain loyal to their nation even if their best interest would be to disengage, secede, or revolt. Case studies repeatedly find anecdotal evidence of manipulative uses of historical myths, but this point is supported by quantitative studies, for instance by showing that elites invest more in nationalist propaganda following social unrest or in highly unequal societies (Paglayan, 2022; Solt, 2011). Disentangling prosocial historical myths from selfish ones to prevent abusive use of historical material is an important avenue for further research.

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Competing interest. None.

Notes

1. This definition of historical myths is very similar to the notion of "collective memory" that is prevalent in the sociological and psychological literature (for a discussion of this concept, see Hirst & Manier, 2008). Yet, following a prominent tradition in the study of nationalism, we choose the notion of "myth" to emphasize the fact that collective memories are not necessarily accurate – and are almost systematically contested by professional historians (on the concept of "national myth," see Bouchard, 2013). Of course, historical myths are not always entirely false, as they are often based on true events and facts – for instance, wars and revolutions that really occurred. However, they typically introduce important distortions in these facts and in their historical interpretation (Hobsbawm & Ranger, 1983). In sum, our use of the concept of "myth" is not to be understood in the traditional anthropological sense of a purely fantastical tale, but in the more nuanced definition used in the field of nationalism studies. The notion of myth also allows us to emphasize the "narrative" dimension of collective representations of the past. Indeed, historical myths typically do not emphasize specific historical events in isolation, but rather tends to weave them into a coherent story (Liu & Hilton, 2005; Smith, 1999).
2. In a text published on the website of the Kremlin on July 12 of 2021 called "On the Historical Unity of Russians and Ukrainians," Vladimir Putin wrote about Ukrainians in these terms: "Our spiritual, human and civilizational ties formed for centuries and have their origins in the same sources, they have been hardened by common trials, achievements and victories. Our kinship has been transmitted from generation to generation. It is in the hearts and the memory of people living in modern Russia and Ukraine, in the blood ties that unite millions of our families. Together we have always been and will be many times stronger and more successful. For we are one people." See http://en.kremlin.ru/events/president/news/66181.

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Open Peer Commentary

Beyond our "ancient roots": Toward a broader understanding of the motivational power of societal meta-narratives

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Abstract

The "historical myths" addressed in the target article are but one type of societal meta-narrative, a cognitive framework for understanding the story of one's group: Its origins, purpose, turning points, threats and opportunities, key relationships, and the appropriate affect for group members. Engagement with the broader literature on meta-narratives, including political and sacred myths, and on group entitativity is recommended.

In the target article, Sijilmassi et al. identify "historical myths" as "mental representations of the collective past that are widely shared across individual minds in a given population, and are viewed by group members as foundational for group cohesion" (sect. 1, para. 1). They then elaborate upon this definition, however, with details that go far beyond their "collective past," including "ancient roots" for an "organic entity tied by ancestral bonds" with a "long history of interactions" and a continuous and distinctive "historical trajectory" providing a "sense of deep connectedness and solidarity through time."

By "historical myths," the authors are clearly referring to a type of *societal meta-narrative*, a cognitive framework for understanding the story of one's group – where it came from and where it's headed. Categories of societal meta-narratives include *political myths* (Bottici, 2007; Flood, 1996; Girardet, 1986; Tismaneanu, 1998; Tudor, 1972), *sacred myths* (multiple works by Malinowsky, 1926, 2014; Levy-Bruhl [1935] 1983), and *group charters* (meta-narratives focused on a purpose, as in Liu & Hilton, 2005). Meta-narratives are also often simply called *narratives* (Maan, 2015, 2018; Smith, 2003), although they should not be confused with *stories* about the group. Stories are accounts of specific events, while meta-narratives are the cognitive framings that underlie such stories – the gist of what has happened or will or may happen, with the group as protagonist, providing group members with an interpretive framework for such events.

The nation with ancient roots and a long continuous history described in the target article is only one category of groups with meta-narratives, albeit a powerful and important one. Other groups also use meta-narratives, including nations whose roots are not ancient, like the United States, and countries that are not nations, like Spain and Canada. Many meta-narratives address all of humanity, not specific sub-groups; these include both the appeals of universalist religions like Christianity and Islam and the narratives promoted by environmentalists.

As cultural technologies, meta-narratives have many important purposes. They create our sense of belonging to a group and reinforce its value to us. They may identify who else matters: God, our neighbors, our allies, our enemies and rivals. They tell us whether things are improving or declining for us, sometimes identifying turning points in the past, present, or future. The directions and rates of change they describe for our group tell us how to feel – proud, hopeful, ashamed, fearful, or angry. They may also encourage our participation as individuals within the group – from choosing a career in science or law enforcement to suicide bombing.

Although fitness interdependence may be a reasonable hypothesis for explaining part of the appeal of meta-narratives, I would like to invite the authors to consider a broader approach. Hamilton (2007) reviewed the concepts associated with group *entitativity* – the perception that some category of people constitutes a group rather than a collection of individuals. One of these concepts, that group members share the same essence, may be at the core of the "ancient roots" argument, but there are other ways in which people may be "essentially" the same, such as sharing a particular ideology.

Another concept closely associated with entitativity is *agency* – the ability to act as a group. Group agency is especially apparent in meta-narratives that describe a group mission (a problem to address or a goal to be achieved), such as claiming a continent (Manifest Destiny), making the world "safe for democracy" (per Woodrow Wilson, 1917) or the restoration of a group's past status (becoming "great again," as in the rhetoric of Ronald Reagan and Donald Trump).

Further research, taking more of this related scholarship into account, may strengthen or inform the revision of the authors' hypotheses. For example, it would be essential to assess the relative contributions of three dimensions of group identity – shared roots (ancient or otherwise), shared beliefs (religious or secular, e.g., communist, capitalist, or anarchist ideology), and shared commitment to a group mission or other goal. In some cases, the three are combined, as in ethno-nationalist independence movements.

I would also encourage the authors to be more rigorous in their definition of "historical myth," or in their use of examples. The United States, in particular, does not have an "ancient past," as it began less than 250 years ago (or 460 years ago if one dates to the earliest European settlement at St. Augustine), and many American citizens today do not have – or do not know whether they have – ancestors who were present at its founding. Indeed, recent immigrants are often more patriotic and less ambivalent about the United States than native-born Americans (Nowrasteh & Forrester, 2019). The United States may thus be a case where shared ideology and shared mission outweigh shared roots, at least for many.

Relatedly, empirical work could, for example, compare the strength of group identification of Lebanese who identify as the descendants of the Phoenicians with those whose primary national identity is as post-Ottoman Levantine Arabs. It would also be valuable to study those whose group bonds are based in belief but not shared ancestry or ancient history, such as the Muslims of North Africa and Indonesia.

And finally, many meta-narratives do not address the past at all, but rather the future of the group, based on its current trajectory (as in climate change meta-narratives), potential threats from dangerous neighbors or subversives within (Saucier & Akers, 2018), or religious prophecies, as in the Christian apocalypse or Rapture. The motivational power of meta-narratives asserting a

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common and valued past should be compared with those for which history – shared or otherwise – is irrelevant.

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What about language?

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Abstract

Myths about a remote shared past can certainly promote cooperation between distantly related people, seemingly via their impact on our social cognition, and ultimately facilitate the achievement of complex tasks in large-scale societies. Nonetheless, the creation and transmission of these complex narratives are not possible without the parallel development of sophisticated language(s), endowed with properties like displacement (enabling mental travels in space and time) and complex syntax (enabling the assembly and communication of complex thoughts).

Sijilmassi et al. make a compelling case for historical myths as core components of people's psychology with a role in promoting cooperation. According to the authors, myths fulfill this role by targeting specific features of our social cognition, particularly, our sensitivity to cues of fitness interdependence within groups. They further claim that their model can account for the design-features of historical myths, as well as their cross-cultural similarities and differences. Surprisingly, in their hypothesis, Sijilmassi et al. seem to have ignored language (the term "language" is not mentioned even once in the text). Language plays a central role in defining, maintaining, and spreading group/ethnic identities, certainly on a par with the sense of a shared a past crystallized in the type of myths considered by these authors. We are referring here to language as a core component of human cognition and behavior, which grants us the ability to project to the past, to share these mental excursions with others, and to promote human cooperation, which are all central aspects of the model posited by Sijilmassi et al.. This commentary is intended to address this crucial omission. Including language in this otherwise interesting model can be expected to improve its explanatory power.

The creation and transmission of historical myths can be viewed as a specific instance of our more general ability for storytelling, which builds on our advanced linguistic abilities and which fulfills important social functions. Anchoring the advent of historical myths to current narratives of language evolution vis-à-vis human social evolution is expected to result in a richer account of the place of myths within human socialization patterns and social cognition, as intended by the authors. In this sense, two of such narratives stand out as particularly promising. One is Dunbar's view (e.g., 2014), who has claimed that the emergence of storytelling abilities might have favored the creation of larger and more complex human groups, mostly through the role of narratives in reducing social stress. Accordingly, while primates rely on grooming for managing social conflicts, humans have circumvented the limitations of grooming, which is much time-consuming, and use instead language to resolve conflicts and reinforce bonding. Like grooming, storytelling (but also other activities governed by language, such as feasting or religion) triggers the endorphin system and increases bonding (Dunbar, 2021). In truth, most of the affiliative behaviors supporting coalitions highlighted by Sijilmassi et al. depend on language. One notable example is friendship. Cross-culturally, friendship relies on a small set of dimensions, or cues of community of origin, like a shared place of birth, a similar educational history, or a common worldview (see Dunbar, 2018 for details). These cues are both language-dependent and relevant for the creation of myths. More generally, there is evidence of a coevolution between the reduction in reactive aggression and the complexification of language (see Progovac & Benítez-Burraco, 2019 for details). This means that language is both a trigger and an outcome of our trend toward a prosocial behavior (the latter certainly including all forms of coalitional support). Accordingly, as human socialization patterns complexified, modern-like languages seemingly emerged, endowed with extensive vocabularies and layered syntax, and as such, more suitable for transmitting sophisticated knowledges and narratives to others (including historical myths) (see Benítez-Burraco & Progovac, 2020 for details), this ultimately promoting further cooperation, as hypothesized by Sijilmassi et al..

A second evolutionary narrative of interest is Corballis' view (e.g., 2018, 2019). Myths are certainly complex narratives about a distant (sometimes irreal) past. For creating a mythological account of one's own history, one needs to be able to project oneself to the past and eventually, to make mental wanderings in space and time. As with storytelling more generally, this is only

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possible because of our advanced abilities for mental time travel (MTT) (Ferretti et al., 2017). Even more generally, displacement (i.e., the ability to talk about things and events outside from the here and now) is universally acknowledged as one core property of human language (Hockett, 1960). Nonetheless, two opposite views exist of the relationships between displacement and language. One view is that it was the advent of full (i.e., recursive) syntax that enabled humans to produce utterances about situations (spatial or temporal) not encountered before (e.g., Hauser, Chomsky, & Fitch, 2002; Pinker & Bloom, 1990, among many others). The other view is that it was the emergence of an enhanced MTT ability, of an unbounded and generative nature, that resulted in a more displaced, thus more sophisticated language (and in more sophisticated narrative abilities). Neurobiologically, this potentiated MTT ability was likely the outcome of the enhancement of our episodic memory, which enables us to visit past events (Tulving, 2001). Thinking about the objectives of the target paper, these cognitive issues are worth considering, since Sijilmassi et al. also aim to provide a cognitive account of the origins and functioning of historical myths. Linking all this to selected changes in our social cognition makes a lot of sense but linking all this to changes in our MTT abilities seems to make sense too.

Interestingly, these two evolutionary narratives might be related. There is evidence that our trend toward a more prosocial phenotype might have favored the neurobiological changes that enhanced our episodic memory, our MTT abilities, and ultimately our language(s). In brief, our episodic memory heavily depends on selected hippocampal functions, but there is also evidence of notable changes in the hippocampus during recent human evolution (reviewed by, e.g., Benítez-Burraco, 2021). Since the hippocampus is involved in stress management too (McEwen, Eiland, Hunter, & Miller, 2012), our trend toward an increased prosociality (entailing a reduction in reactive aggression) can be hypothesized to have promoted both quantitative and qualitative changes in the hippocampus, and ultimately in our MTT capacities, displacement as found in language(s), and our abilities for storytelling. The resulting richer narratives and more sophisticated cultural practices, which certainly include the creation and transmission of historical myths, can be then expected to have reinforced our prosocial conduct and our affiliative behaviors, as suggested by Sijilmassi et al.

In summary, the take-home message of this commentary is that if one aims to understand the role of historical myths in explaining core aspects of human societies, one should consider them on a par with how language evolved, and particularly, how it co-evolved with our prosocial behavior. A reason is that language is both the cognitive tool for creating and transmitting myths, and a behavioral tool for managing social conflicts and promoting social cooperation, to which myths also certainly contribute to.

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Myths of trauma and myths of cooperation: Diverse consequences of history for societal cohesion

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Abstract

We propose that historical myths fall into two distinctive categories: Traumatic and cooperative. Traumatic myths, highlighting collective suffering, can undermine trust and foster conspiracy theories, whereas cooperative myths, emphasizing collective action, enhance group cohesion and within-group coalition building. Psychological and sociological evidence supports these divergent impacts of historical myths both in nations and social movements.

Sijilmassi et al. posit that national historical myths play a crucial role in rallying coalitional support for large-scale collective action, fostering social cohesion through coalitional recruitment. They

also stress that historical myths, which are decisive in founding ethnic groups or nations, often emphasize common ancestral bonds and/or highlight significant events that have shaped the group. However, we claim that historical myths, also referred to as "group charters" (Liu & Hilton, 2005), can take a variety of forms. We focus here on two categories of myths: Those built on collective trauma and on cooperation. We claim that contrary to cooperative historical myths, myths based on trauma can undermine rather than establish within-group social cohesion.

Similarly to Sijilmassi et al., we define historical myths as shared collective memories that play a foundational role in a group's history, and that are based in most cases on significant collective experiences rather than fantasies. Examples of traumatic historical myths include the history of genocide in Armenian collective memory, the Katyń massacre in Polish collective memory, and Jim Crow in Black cultural memory in the USA. Cooperative myths include the Stonewall rebellion in LGBT+ memory, the civil rights movement in the USA, or the Solidarity movement in Poland. Both psychological and sociological evidence suggests that these two kinds of myths might have opposite consequences for social cohesion and coalitional recruitment.

Acts of genocide, colonial crimes, and exploitation destroy national cohesion and create everyday mistrust among the members of victimized groups. During mass traumatic events, hypervigilance and obsession with treason undermine societal cohesiveness (Haska, 2011). Therefore, any reminders of past atrocities recall times when group cohesiveness was endangered. Studies conducted in Greece and Poland showed that reminders of historical trauma (such as the Katyń massacres or Nazi massacres of Greeks) deteriorate trust, and enhance paranoia and conspiracy theorizing among people highly identified with their nation (Pantazi, Gkinopoulos, Witkowska, Klein, & Bilewicz, 2022). Traumatic national myths lead to large-scale divisions of societies during subsequent crises, a process known as "traumatic rift" (Bilewicz, Witkowska, Pantazi, Gkinopoulos, & Klein, 2019). A cross-national study of WWII memories showed that people with higher levels of transgenerationally transmitted war-related trauma are more willing to believe in conspiracy theories (Bilewicz, 2022). A Polish study looking at the cognitive availability of historical trauma found that people focused on their traumatic national history have a greater tendency to believe in conspiracies (Skrodzka, Stefaniak, & Bilewicz, 2023), whereas a study in Hungary found that high availability of national trauma increases a belief in Jewish conspiracy – thereby undermining the cohesion between different ethnic groups living in the country (Skrodzka, Kende, Faragó, & Bilewicz, 2022). This process could be explained by the fact that historical myths evoke feelings of powerlessness and low control, key antecedents of conspiracy beliefs (Bilewicz, 2022; Bilewicz & Imhoff, 2022; Kofta, Soral, & Bilewicz, 2020). Ultimately, traumatic historical myths would decrease trust toward fellow ingroup members and authorities (Bilewicz & Liu, 2020).

Conversely, myths of historical cooperativeness and collective agency could have a powerful role in coalitional recruitment and within-group cohesion, both in nations and in social movements. Such historical narratives play a distinct psychological role, allowing individuals to restore a sense of control and agency at a collective level (Bilewicz et al., 2019). Cooperative historical myths motivate collective action by elevating key antecedents to collective action, such as awareness of perceived injustice, a sense of collective efficacy, and strong group identities (Freel & Bilali, 2022).

Research on historical moral exemplars reveals that people reminded about their ingroup members cooperating with the outgroup during past conflicts become more open to reconciliation and forgiveness (Čehajić-Clancy & Bilewicz, 2020, 2021). Moreover, such stories of cross-group cooperation can foster within-group social cohesion. A recent study in Rwanda demonstrated that awareness of individuals who rescued victims during times of genocide (as opposed to mere awareness of genocide trauma) strengthened Rwandan national identity over tribal identities (Atete & Bilewicz, 2023).

One of the emblematic examples of cooperative historical myths is the role of the Rochdale Pioneers myth in the international cooperative movement. The Rochdale Society of Equitable Pioneers was a group of weavers that established a cooperative store in the industrial city of Rochdale in 1844 (Fairbairn, 1994). This was not the first attempt to establish a consumer cooperative, and the shop was not the only endeavor of the Society (Hilson, 2017). However, the establishment of the cooperative store became the founding myth of the cooperative movement. It was the Pioneers, according to that myth, who invented cooperation. This happened mainly because the Pioneers formulated a list of principles that were later used and developed by the International Cooperative Alliance (ICA, established in 1895), and became the Rochdale Principles that were obligatory for every cooperative. Today, the movement based on this historical myth includes more than 3 million cooperatives worldwide. According to Totomianz (2020), the movement of cooperative economy heavily relied on the "cooperative mystics" that allowed for maintaining a certain level of idealism needed for the movement to exist as an alternative form of economy. Without the continuous maintenance and renewal of this mythology, apathy and decline of idealism would endanger the existence of the social movement.

Historical cooperative myths are key motivators of collective action both in national groups, and in large-scale social movements. They might define group prototypes (the moral exemplars), but also establish specific principles that define the group and the rules of its conduct (the moral charter). The role of such myths is fundamentally different from traumatic historical myths that serve as mere reminders of insecurity and existential threats to group existence. Therefore, traumatic historical myths cannot play an equally constructive role in coalitional recruitment and collective action.

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Historical myths as commitment devices

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Abstract

Sijilmassi et al. claim that historical myths are technologies of recruitment that mimic cues of fitness interdependence. Paradoxically, they also claim that people are vigilant and that these myths might not and do not have to convince others, which raises questions about how these myths become culturally successful. Thinking about historical myths as commitment devices helps overcome this paradox.

Sijilmassi et al. provide a novel account for the structure and function of historical myths. They argue that historical myths suggest a long cooperative history and thereby tap into cognitive mechanisms that track cues of fitness interdependence. By mimicking such cues historical myths function as technologies for coalitional recruitment, that is, to convince others to opt for the coalition the myth supports. Historical myths thus owe their shape and cultural success to typical features of our mental architecture.

The explanation for the structure of historical myths is quite convincing and thus constitutes a prime example of cultural attraction, in which micro-scale cognitive and communicative processes help explain large-scale cultural phenomena (Scott-Phillips, Blancke, & Heintz, 2018; Sperber, 1996). The proposed function, however, raises several questions. First, the authors claim that historical myths are unlikely to trigger kinship detecting mechanisms into falsely assuming that coalition members are genetically related. However, they also suggest that historical myths play into our detecting mechanisms for fitness interdependence. But if people are not gullible, as the authors acknowledge (see also Mercier, 2020), then why would the audience alter their coalitional preferences if the coalition does not serve their interests? Second, the authors claim – quite paradoxically – that myths do not have to be successful as recruitment tools, but the producers of the myths only have to believe that they are. But if myths are ineffective then why would producers transmit them in the first place? Furthermore, if the audience's coalitional preferences remain unaffected by historical myths, then why would they adopt and transmit them in their own turn? In other words, how could historical myths travel along and survive social cognitive causal chains and become cultural (Sperber, 2001)?

I suggest we can answer these questions by reconsidering and finetuning the function of historical myths. Instead of regarding them specifically as recruitment tools, we can think of them more generally as commitment devices. Linguistic expressions in general create commitments and thus raise expectations about how one will behave. For instance, if I claim that climate change is a problem, I commit myself to behaving in ways that help to mitigate it (Geurts, 2019). When relating a historical myth, one expresses one's coalitional preferences thereby making an implicit promise that one will act in ways that support the coalition (for the role of commitment in cooperation, see Khan, 2024).

This function of expressing and creating commitment allows for several other functions (Blancke, 2023). First, when historical myths function as commitment devices, people can use them as signals to indicate and track alliances and distinguish those who are similarly committed from those who are not (cf. Funkhouser, 2022). The latter may be outgroup members but also defectors within one's own community. Second, historical myths also function as coordination devices because they allow coalition members to collaborate with people who make similar commitments and to conspire against outsiders and inside defectors who pose a threat to the coalition (cf. Pietraszewski, Curry, Petersen, Cosmides, & Tooby, 2015). Third, historical myths do not convince people in the sense that they alter coalitional preferences. Instead, people adopt historical myths as *post hoc* rationalizations or justifications for pre-existing coalitional preferences. They select these myths in the marketplace of rationalizations (Williams, 2022) because the long-time cooperative bond suggested by the myth accounts for their preferences. Historical myths then justify any further actions *pro* their preferred coalition and *contra* outgroup members and ingroup defectors. This does not mean that historical myths have no impact on others. When adopting a myth, one commits to living up to the expectations raised by the myth, which will lead one to invest in the coalition. As such, historical myths do affect one's audience, not by directly altering other people's preferences, but indirectly through the commitments they create.

This is then how thinking about historical myths as commitment devices answers the questions raised by the authors' proposal that historical myths function as recruitment tools. First, people produce these myths not to convince others but to forge alliances with like-minded others. This explains why myths do not tend to change people's minds. Only those who share coalitional preferences will adopt the myth and become thus similarly committed to it. People are not gullible, but they adopt the

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myths that fit with their socially strategic priors. It is in this sense that historical myths recruit. Second, people who adopt a historical myth have an interest in further spreading the myth for the reasons explained above: To demonstrate their allegiance, to advertise their commitment to the group, to find people with similar interests, to coordinate and collaborate, and to justify their actions. As such, they create and sustain the social cognitive causal chains along which historical myths become cultural.

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Adaptive lags, illusions and common interest

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Abstract

The explanatory model proposed by Sijilmassi et al. appeals to fitness interdependence, and is highly plausible for small-scale societies. We argue that it is less so in the context of the larger societies that much of their empirical evidence is drawn from, and that this is because fitness interdependence does not readily scale up in the way the model requires.

We agree that Sijilmassi et al. have identified an intriguing puzzle and developed a promising solution, though one with an important gap. We are persuaded that motivating narratives of common origin and common fate are sufficiently similar, widespread, and culturally salient as to call for explanation. True, there are no formal phylogenetic controls on the case studies. But the geographic spread and internal variation makes it unlikely that this pattern is an accident of history, widespread now as a result of inheritance from one or few ancestral cultures.

The proposed explanation – that these narratives support large-scale collective action by supporting belief in mutual mass interdependence – has considerable plausibility. As the authors point out, individuals have limited resources to invest in coalitional choice and the stakes can be high. Joining the right coalition can bring great rewards, but the wrong choice can be catastrophic. They further note that cooperative choices are selectively favoured when the cooperating individuals' fitnesses are aligned or interdependent. Indeed, as a culturally complex species for whom differential expertise and divisions of labour make environmental adaptation very much a collective enterprise, fitness interdependences are undeniably part of behaviourally modern human lifeways. Information about interdependence should therefore be vitally motivating, and a shared history of successful mutual interaction is good prima facie evidence of interdependence.

However, we should resist generalising this reasoning to the macro-scale of tribes, nation states and ethnolinguistic groups. First, group membership at this scale becomes more exclusive, as these are not the porous, fission–fusion groups of forager lifeways. So while belief in positively entangled interests across such groups may increase the investments that members are willing to make, it can rarely motivate joining. Second, as the authors are aware, there is a crucial distinction between actual interdependence, where success for Oscar really does depend on success for Max (and others), and the mere belief in interdependence. This is important because interdependence does not scale up well. Genuinely interdependent collective action becomes fragile at scale, because if any essential participants fail in their role then the efforts of all are undermined. Collective action at scale therefore demands structural redundancies, and the fungibility of individuals. But once Max's specific participation in the collective action project becomes fungible, Oscar's success does not depend on Max and their fitness interests (in this respect) are no longer interdependent. All else equal, collective action becomes more effective as one adds both headcount and role redundancy (hence God is on the side of the big battalions), but interdependence declines as the individual contribution of each agent becomes less critical to the overall outcome. At the macro-scale at which most of Sijilmassi et al.'s discussion is focussed, genuine interdependence has largely disappeared.

To some degree the authors fudge this, claiming that at the tribal and nation state level agents have a genuine stake in the general welfare of the collective of which they are a part (target article, sect. 3.2). In some cases (such as existential struggles) this might be true. But unless their hypothesis appeals to high-level selection (and the authors explicitly deny this), "general welfare" is an uncashed metaphor. For the most part, the fitnesses of any two individuals in large collectives are *not* that closely aligned, both for the reasons stated above, and because each should prefer that the other be in the front lines of any battle (real or metaphorical) instead of themselves. As Sijilmassi et al. also accept, interdependence almost always fails in one direction: even if Oscar depends on the general welfare, the general welfare is independent of Oscar and his deeds – and at large scales an individual's contribution to collective outcomes is vanishingly small (a familiar

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conundrum in collective action topics from climate action to the rationality of voting). Similarly, the second adaptive demand on coalition-joining agents – recruiting new parties to their coalitions – also evaporates, as almost none of us are positioned to increase the patriotic fervour of our fellow citizens in ways that would be significant with respect to (fitness-aligned) outcomes. Figure 2 is therefore misleading in large-scale contexts.

So this proposal faces a crucial problem. What makes narratively transmitted illusions of interdependence so seductive? If coalitional participation is a high stakes decision, we would expect well-honed mechanisms of epistemic vigilance to detect fraud and manipulation. The discussion in section 3.1 (target article) shows that in decisions about cooperation and alliance formation, agents are typically nuanced and canny. They are not easily imposed upon. Moreover, agents should be especially wary about committing to coalitions, because false positives (join when you should not) are more costly than false negatives (failing to sign up to a good deal). It is not always prudent to shirk or be a neutral, but it is nearly always better than throwing in with a lost cause (unless your joining would be the difference maker).

Sijilmassi et al.'s main explanation for the compelling character of myths of common origin and fate appeals to intuitive psychology; more particularly, to a commitment to the reality of social collectives as integrated wholes with deep shared histories. But in the absence of genuine fitness interdependence this is on similar ground to the account that they rightly reject in discussing rival views: elite manipulation and origin myths generating cooperative commitments through illusory shared kinship. Why would fictive kinship, generated by a terminological sleight of hand be credible? Indeed! But equally we need an explanation of why epistemic vigilance does not dissolve the illusion of common fate through shared history on the large scale. Because fate is not common, and history is not shared.

We suggest that Sijilmassi et al.'s model, elite manipulation, and fictive kinship are all implicit adaptive lag hypotheses. Agents are vulnerable to illusions of aligned fitness interests (albeit different illusions), because they continue to rely on cues of fitness alignment that were once reliable, because they were so in small social worlds, but are reliable no longer. If we are right, this locates the problem – an updating failure – but does not solve it.

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"We are one people": Group myths also draw cues from self-concept formation

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Abstract

Sijilmassi et al. suggest that group myths explaining the shared history of a people succeed and propagate by leveraging cognitive cues from fitness interdependence. We offer an alternative and mutually compatible account rooting the success of group myths in cues from a different cognitive domain: The development of self-concepts.

To account for the prevalence of group myths explaining the shared history of a people, Sijilmassi et al. suggest that the key characteristics of such narratives incorporate cues of fitness interdependence. These key characteristics – namely, markers of antiquity and continuity, and details about defining events or challenges for the group – accord nicely with the cognitive cues for fitness interdependence that the authors describe. They focus especially on descriptions of "human groups as having an immemorial history of continuous cooperation" which creates a "cue of repeated interaction" (target article, sect. 1, para. 9). However, those narrative features also align with cognitive cues from another domain: The development of self-concepts. We thus present an explanation of how group myths leverage cues that we use to create the "knowledge representation[s] that contain knowledge about us, including our beliefs about our traits … values … goals … as well as the knowledge that we exist as individuals" (Jhangiani & Tarry, 2022). Our account and the argument from Sijilmassi et al. are mutually compatible; in fact, one would imagine that it would make sense for group myths to include cognitive cues from more domains rather than fewer.

Our explanation stems from a common feature of group myths the authors do not mention – that they often describe the relevant group as a quasi-coherent self with distinct characteristics, goals, and desires. Importantly (if almost tautologically), the group-self is bounded by the group myth from the rest of the social world, like an individual self. Consider the mythical origins of Ukraine, among many other examples: "Ukrainians were never an inert mass – but always striving toward liberation and independence." The unique needs and qualities of the group-self further clarify its boundaries; in this case, Ukraine's selfhood takes shape primarily through the quest for freedom. Group-selves are narrated as individuals – a claim bolstered furthered by the presence in group myths of individuals that act as stand-ins for the nation, whether real (i.e., Simone Bolivar) or fictional (i.e., Brer Rabbit).

The self-concept literature traditionally focuses on two facets of the self. The first is self-clarity (Campbell, 1990; Campbell & Lavallee, 1993; Campbell, Assanand, & Di Paula, 2003), which describes how a self-concept distinguishes the self from one's social world and unifies the unique aspects of that self. Clearly, group-selves use self-clarity cues – myths present a social boundary for the group, and that boundary structures a set of group traits and behaviors. The less obvious link is with the second facet of self-concepts: Self-continuity. Self-continuity is temporal and describes the sense of connection between the past and present of a self (Bluck & Alea, 2008; Habermas & Köber, 2014, 2015). Experimental work on self-concepts has found that when either facet is threatened, people turn to autobiographical memory to restore self-continuity, which in turn boosts self-clarity (Jiang, Chen, & Sedikides, 2020). Autobiographical memories sustain the apparent unity of the individual self.

We argue that a similar dynamic exists between the unity of the group-self outlined in historical myths and the core features

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of those myths described by Sijilmassi et al. Antiquity is obviously a feature of both historical myths and autobiographical memories; they both occurred in the past, and we recognize them as such during recall/consumption. Continuity between past and present is also well-documented in autobiographical memory – extensive research shows that our memories are not faithful replays of the past, but instead reconstructions that better align with our present beliefs, experiences, and information (Hastie, 2022; Hogendoorn, 2022; Loftus & Palmer, 1974). Similarly, "historians frequently note that many apparently immemorial national traditions were in fact recently 'invented' with the clear aim of 'establishing or symbolizing social cohesion or the membership of groups, real or artificial communities'". A return to defining events or challenges is less obvious, but also appears in experimental work on autobiographical memory and self-concept (Jiang et al., 2020). When self-concept clarity is low, people most easily regain it when recalling important life events, as opposed to unimportant or general events. Historical myths likewise remind their listeners of important past events experienced by the social unit, which generates both continuity in the group-self and elucidates its key characteristics – just as it does for individuals. The cumulative effect of these self-concept cues in historical myths is to create a continuous and clear model of a group-self in consumers of historical myths.

Of course, this raises the question of how social units benefit from appearing to their constituents as coherent selves. Presumably, constituents are better served by clearly knowing the boundary and values of their group, and modeling the group as a coherent self may make this information more accessible. But alongside this general answer, we raise a more interesting possibility: Constituents of a coherent group-self are more easily cued to give up their individual self-concepts in favor of the group self-concept, which then emboldens individual behaviors aimed toward group-level benefit. Suggestive here are thematically similar group rituals that encourage collective effervescence in constituents – in other words, the feeling that one is part of something larger than oneself, like a nation. Reciting the Pledge of Allegiance, the Pesach Seder, and military marches are all good examples. Additionally, it seems likely that historical myths are deployed more often at moments in a group's history where group-level sacrifice is beneficial: For instance, during revolutions or wartime. If so, this would fit with our argument that establishing a group-self, by incorporating the cues outlined above, also effectively pushes for diminution of individual self-concepts in consumers of the historical myth. We are not aware of data on this latter point, though the claim is certainly plausible.

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Collective selfhood as a psychically necessary illusion

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Abstract

Drawing on developmental psychopathology and thinking about the we-mode of social cognition, we propose that historical myths – be they on the scale of the family, the nation, or an ethnic group – are an expression and function of our need to join with other minds. As such, historical myths are one cognitive technology used to facilitate social learning, the transmission of culture and the relational mentalizing that underpins social and emotional functioning.

The contested nature of history, the invention of traditions, and imagined communities are integral to understanding the melee of human experience. In our commentary on "Our Roots Run Deep," we explore the interplay between historical imagination and individual identity through the lens of developmental psychopathology. Our aim is to illuminate how our self-conceptions, in relation to others, underpin fundamental aspects of human functioning – ranging from forming attachments and collaborating with others (echoing Freud's notion of "love and work") to rationalizing aggression.

The target article compellingly demonstrates how historical myths are uniquely suited to highlight the extensive mutual dependence within a coalition. While this argument is persuasive,

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we propose that it may represent only a fragment of the broader narrative. We argue that the profound resonance of historical myths lies in their ability to foster a sense of social trust through generating a state of collectivity – what may be termed a "we-mode" – signalling a readiness to act together. Far from implying a fusion of identities, the we-mode represents a dual-level structure that simultaneously represents a notion of self and the independent perspective of another but embedded in a shared understanding of the world. The concept of shared cognition – an irreducibly collective mode of understanding – has been acknowledged by a diverse range of scholars, including developmentalists (Tronick, 2008), primatologists (Tomasello, 2019), philosophers (Tuomela, 2005), psychoanalysts from various classical schools (Winnicott, 1956), and an increasing number of neuroscientists (Gallotti & Frith, 2013; Schilbach, 2016). Gallotti and Frith suggested that each participant in a social interaction jointly intends to accomplish a particular outcome, necessitating the adoption of a "first person plural perspective" – termed the "we-mode" (Gallotti & Frith, 2013, p. 16). According to this view, the we-mode may be organized around cognitive and neural structures intrinsic to our individual make-up, arising from a unique developmental and evolutionary trajectory (Tomasello, 2019). Within the scope of shared intentionality, a "joint agent" comes into being when aligned mental states enable a shared goal to be adopted. This alignment is grounded in a mutual respect, which stems from each participant having a distinct role in the collaborative activity (Tomasello, 2016). The we-mode presupposes a mutual recognition of the subjectivity and humanity of the other – a recognition of the other as a person or agent as real as oneself, and an acknowledgment of the inescapable interconnectedness that characterizes the human condition (Tomasello, 2016, p. 5). The significance of historical myths for large social groups can be partially attributed to their ability to extend these interpersonal processes to the broader, more impersonal societal context. They are invariably designed to drive we-mode function. Why is that important? The we-mode may be critical to establish a state of interpersonal trust essential for the most profound of human functions, the social transmission of knowledge: epistemic trust (Sperber et al., 2010).

The importance of we-mode and epistemic trust becomes obvious when weakness of self-structures undermines the normal experience of we-mode and deprives the individual of epistemic trust and therefore of effective social learning. This is sadly too often the case in individuals who experienced childhood maltreatment, and their capacity to learn from others is profoundly impaired. One of the characteristics of complex trauma is a loss of selfhood, which can result in frightening experiences of fragmentation, breakdowns in meaning, and isolation – how can one connect with others, how can others connect to you if there is no self to which this connection can be anchored (Luyten, Campbell, & Fonagy, 2020)?

In the context of the intrinsic intangibility yet necessity of selfhood, perhaps historical myths manifest this process writ large. We need to tell ourselves the story of who we are in order to maintain the sense of collective selfhood that is essential for the perception of group coherence and agency, but also in order to feel connected to others in our shared culture. Individuals who do not experience relational mentalizing, in which one sees oneself as accurately and benignly held in mind by others, respond by showing increased epistemic vigilance in relation to others. Historical myths are regenerative. They restore interpersonal trust in the individual whose personal experience could be expected to lead them to a state of epistemic hypervigilance – a profoundly socially maladaptive state at population level. Historical myths enhance this illusion of joining in a narrative generating the psychological experience of belonging and opening the mind to social learning without the barrier of excessive epistemic vigilance. In fact, few historical myths considered in the target article could withstand excessive epistemic scrutiny. But that is not critical. The creation of an experience of continuity with the past, facilitating a collective mentalizing we-mode process, counteracts vigilance and increases readiness to collaborate – but, more important, a readiness to learn from the other and be part of the human "bucket brigade" passing social knowledge from one generation to the next. Historical myths that operate on a national level are perhaps an appropriate priority of focus of the target article. But they are also part of the community narrative that families, neighbourhoods, and institutions weave to generate we-mode thinking to facilitate the social transmission of opaque aspects of essential knowledge. This involves constructing a shared narrative about our interrelations, enabling a form of collective cognition and vision, thereby paving the way for love, labour, and purposeful aggression.

The historical myths associated with contemporary populist extremism (ideas about nativism, or about the loss of a group's traditional freedom at the hands of supranational institutions) might be understood as a response to this epistemic disruption and the need for a collective story that makes sense. We have conceptualized epistemic disruption as involving both pronounced epistemic mistrust (i.e., reduced faith in democratic processes) *and* pronounced epistemic credulity, or gullibility (i.e., that Britain's historical identity and national greatness is being deliberately undermined by the European Union). We have suggested that individuals who experience a sense of being separated from the minds of others around them are vulnerable to this epistemic dilemma.

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Myths and fitness interdependence: Beyond coalitional longevity

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Abstract

This comment seeks to extend the authors' argument by considering how perceived fitness interdependence is generated in different settings. Based primarily on research from political science, it argues that strategic agents may seek to design myths that emphasize not only the longevity of their coalitions, but also internal features such as material and status equality and institutional impartiality.

Sijilmassi et al. offer a novel account of the role of fitness interdependence in motivating social cooperation. Questions remain, however, about what exactly perceived fitness interdependence entails and how it is generated in different coalitional settings. The present comment seeks to foreground those questions and suggest avenues for extending the authors' argument by bringing it into conversation with related research from political science and philosophy.

According to the authors, strategic agents design myths to promote a perception of fitness interdependence in potential coalition members. In large groups, this perception is a product of the extent to which "each individual benefits from the general welfare of other group members" (target article, sect. 3.2, para 3). This definition is ambiguous regarding whether the welfare in question refers to the aggregate group welfare or to the welfare of each individual member. Between groups with the same aggregate welfare, an individual who can anticipate being in the lower part of the socioeconomic distribution will likely have a higher perceived fitness interdependence with a group in which goods are distributed more equally or in which the welfare of the worst off is prioritized (Buchak, 2017; Fleurbaey, 2010; Rawls, 1999).

Correspondingly, myths designed to elicit broad cooperation may offer signals not only about the longevity of the group but also about its internal organization, distributive characteristics, and associated quality of life. An illustration of this point comes from India, where as Prerna Singh shows, some elites have successfully mobilized subnational sentiment by appealing to "the idea of an equal, horizontal political community" that transcends caste and religious distinctions. On the other hand, where myths sought to entrench existing inequalities, they were more likely to inhibit the development of an inclusive subnational identity and its associated welfare benefits (Singh, 2015, pp. 83, 94, 104–107, 182–183).

The authors further note that when members of a large coalition perceive they have a high degree of fitness interdependence, "they should be more willing to invest their limited resources for the sake of other group members" (target article, sect. 3.2, para 8). Underlying this statement is a claim about the importance of reciprocity, which can cement the perception of interdependence by rendering the reciprocator valuable to her partner (Barclay, 2020). Reciprocity involves a symmetrical relationship in which each party voluntarily responds to similar treatment by the other (Fehr & Gachter, 1998; Kahan, 2003; Kolm, 2008). For reciprocal relations to be sustained over time, there should be a sense of balance, as well as trust that others will reliably act in kind (Becker, 1986; Rothstein, 2017). In a large group, however, individuals may differ significantly in how they experience the costs of a given contribution (Brown, 2020; Goodin, 2002). If the value of public goods is distributed evenly, then those whose participation is more costly may have a lower perceived interdependence than others because they have contributed more for roughly the same benefit (Ostrom, 2003).

This problem may be resolved if all members feel that the benefits of cooperation are equivalent or proportional to its burdens (Brown, 2020; Mau, 2004). This condition is likely to be met when burdens imposed are roughly equal for all and when institutions treat everyone impartially (Freitag & Bühlmann, 2009; Rothstein & Stolle, 2003; Svallfors, 2013). Thus, as Bo Rothstein has argued, the high level of cooperation in Nordic countries is a product not of culture or history but of an institutional design that sustains reciprocity by treating people evenhandedly (Rothstein, 2017).

In keeping with these observations, strategic agents might emphasize themes of trust and institutional universality in their myths to signal to members that they can rely on ongoing, fair reciprocal relations. For example, according to Rogers Smith, the story of American peoplehood invoked by Thomas Paine and the Declaration of Independence stressed political equality and the guarantee of individual rights to promote trust and convey the benefits of cooperation for all (Smith, 2003b, p. 60). Narratives based on the idea of divine election and covenant also emphasize the entrusting of a people with a sacred mission, embodied in a law that all members must follow, and their reciprocal trust in one another to achieve that mission (Smith, 2003a, pp. 49–58).

Finally, the authors state that identity fusion, including the feeling of "intense kin-like bonds," is a valuable proximate measure for perceived fitness interdependence because it captures "the extent to which individuals perceive their fate to be inseparable" (target article, sect. 3.2, para 3) from that of others. While identity fusion may help to solve coordination problems by aligning individual behavior with the needs of the group, scholars acknowledge that it can also be invoked in ways that are detrimental to fitness (Cronk & Atkipis, 2018). A recent body of research on political polarization has highlighted the divisive implications of group identity, which can undermine generalized trust and cooperation (Bonomi, Gennaioli, & Tabellini, 2021; Mason, 2015; Shayo, 2009; Tajfel & Turner, 1979). Groups with high political identity fusion may demonstrate "tribal corruption effect," in which they protect the in-group's reputation by suppressing rather than punishing bad behavior within it (Jost, Baldassarri, & Druckman, 2022). Group identity has also been found to decrease the likelihood of social-welfare enhancing behavior toward out-group members (Chen & Xin Li, 2009).

As a result, where identity fusion is activated on the sub-coalitional level, it could undermine percevied fitness interdependence with the larger group. To avoid such outcomes, strategic agents might choose to design myths that stress equal status and reduce esteem-seeking distinctions among members. For example, according to

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George Mosse, the creation of shrines to unknown soldiers in the aftermath of World War I set out to evade distinctions of rank and project an ideal of brotherhood and equal sacrifice. In the case of Germany in particular, he argues, such wartime myths aimed to strengthen nationalism following the country's defeat, and promote unity against the threat of class struggle and political division (Mosse, 1990). While this example also underscores the dangers of group identity, it indicates another way in which myths may seek to highlight internal features of the group as well as its longevity.

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Uncertainty reduction as an alternative explanation of historical myths

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Abstract

We agree with Sijilmassi et al. that historical myths are a tool for coalition recruitment. We argue, however, that a close fit between an evolved entity and an identified function does not imply that the latter is the critical evolutionary trigger. We also propose an alternative individual-centric explanation: Historical myths reduce uncertainty by providing cognitive and behavioral guidance.

Sijilmassi et al. present a detailed examination of how historical myths can facilitate coalition recruitment. While we agree with the authors that historical myths are an effective tool for coalition growth, we are not convinced that this is the primary reason for why historical myths have evolved culturally in the first place. In this commentary, we argue that it is difficult to trace social evolution in this domain, and that even a close fit between an evolved entity such as historical myths and an applied function such as coalition recruitment does not imply that the function acted as a critical evolutionary trigger. We submit an alternative explanation: The key function of historical myths is to reduce psychological uncertainty among individuals by providing cognitive and behavioral directions. As we argue below, this alternative explanation has the advantage of not having to assume social interaction patterns (e.g., why and how people are recruited into coalitions). The explanation is based on the well-established psychological finding that most individuals are rather intolerant of uncertainty and use heuristics, including in social alliances, to reduce uncertainty by eliminating alternatives. Historical myths may be such psychological rules of thumb that are specifically useful for eliminating cognitive and behavioral alternatives for the culture and its specific adaptations in which they survived.

There are prominent precedents that illustrate the complexity of social evolution and the difficulty of tracing the roots of some social adaptations. For example, several competing theories have been discussed to explain human crying (Vingerhoets & Bylsma, 2014; Zickfeld & Grüning, 2021). One account conceptualizes crying as a social function (e.g., Gračanin, Bylsma, & Vingerhoets, 2017; Vingerhoets, Ven, & Velden, 2016), but even in the light of this theory it remains unclear which of the functions of crying observed today (e.g., tears as social glue or as a visual signal for help) drove the evolution of human crying. Other examples include the domestication of plants and animals

(e.g., Smith, 2015) and even the development of language (e.g., Burling, 1986; Walker & Hamilton, 2011). Similarly, historical myths may be an effective tool for recruiting people into a particular coalition, but the effectiveness of historical myths as such a tool does not require that they drove the development of historical myths in the first place. Instead, the fact that historical myths are so effective at recruiting coalitions may be a by-product of a more fundamental psychological mechanism of reducing individual uncertainty.

To explain the remarkable longevity of historical myths, we propose that these myths act as cognitive and behavioral orientations for individuals. Learning about one's ingroup's past provides a behavioral framework for the world that reduces the cognitive load of decision making by providing a set of options (e.g., whom to seek as partner or what core values to believe in) and excluding a wide range of alternatives (e.g., ineligible options for dating and mating or what beliefs culturally considered nonsensical). This view of how myths work is evidently meaningful when we consider the parallels with religious beliefs. According to the uncertainty-reduction hypothesis, religious beliefs help individuals tolerate an unpredictable world. Consistent with this hypothesis, Barber (2011) has shown across 137 countries that religious belief declines as key uncertainties (e.g., income security, economic development, and personal health) decrease. Similarly, historical myths may have evolved because they served a critical function for individuals in reducing experienced uncertainty by providing clear guidance on what to do and when.

The uncertainty-reducing function of myths can also (inadvertently) make them effective for coalition recruitment. In this respect, the uncertainty-reducing explanation is consistent with the design features of historical myths discussed by the authors. According to the present interpretation, myths communicate past experiences of one's own ingroup or of a new outgroup. In the former case, following the myth provides a sense of sharing of traits and customs with one's ingroup. In the latter case, following the directions of a myth affords a set of habits (e.g., certain values or behaviors) that can transform a current outgroup into a soon-to-be ingroup.

Similar to the function of coalitional recruitment, the present explanation does not depend on historical myths actually providing optimal guidance for decision making. Rather, the appeal of historical myths is that they reduce the uncertainty experienced by individuals by prescribing a set of rules in the form of morals and dos and don'ts (see, e.g., Grüning & Krueger, 2023; Krueger & Grüning, 2021, 2023, 2024). That is, myths that provide a set of guidelines for making reasonable, though not necessarily optimal, choices may be effective decision aids based on past ingroup experience. In other words, myths can function as clusters of social heuristics.

Sijilmassi et al.'s account of the utility of historical myths for coalitional recruitment is instructive about the effectiveness of historical myths in this application context. Historical myths can be functional recruitment tools for the ingroup. Still, we are wary of concluding that this function is the central reason for the evolution of historical myths. On a metatheoretical note, we argue that it is difficult, if not impossible, to identify which of the existing functions of an evolved entity triggered its evolution in the first place, especially for social entities like myths. A more individual-centered and simpler explanation might be that myths are a useful tool for learning from past experience which values and behaviors are more successful than others. Admittedly, it may well be that the combination of mutually reinforcing functions (also beyond the two present ones) has compensated for the evolution of historical myths.

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Group myths can create shared understanding even if they don't act as superstimuli

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Abstract

Sijilmassi et al. argue that myths around shared ancestry and history exploit an evolved psychology of interdependence. In contrast, we argue that psychological exploitation is not required. Rather, such myths may be one method, among many, to create a shared understanding of group boundaries, which can be "self-enforcing." We summarize the game-theoretic basis for this account and some supportive evidence.

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Sijilmassi et al. nicely summarize the evidence for the prevalence of group-myths regarding shared ancestry and histories, and raise the interesting question of why they are so common. They seem to suggest that such myths are prevalent because they trigger an evolved psychology attuned to histories of "fitness-interdependence." In large-scale societies, where no real fitness interdependence exists, we take Sijilmassi et al. to be arguing that these cognitive mechanisms misfire because the narratives are crafted to act as compelling superstimuli. For instance, a Jew might help out another Jew because he is led to erroneously believe his own success depends on that of his co-religionists, or that he is liable to have repeated interactions with a co-religionist and therefore have the favor returned. However, since there are millions of Jewish people spread throughout the globe, neither of these are likely. Consequently, Jews who willingly help out other Jews, just because they share a purported ancestor or history must be acting on an erroneous belief that their shared ancestor was quite a bit more recent or their community orders of magnitude smaller.

We present an alternative explanation that does not require such an extreme "error." Specifically, we suggest narratives around ancestry or recent history are one way, among many, to create or alter our common understanding of who belongs to the in-group and therefore is subject to specific rights and responsibilities. These beliefs are self-enforcing, even in the absence of actual, or inaccurately perceived, fitness-interdependence.

This explanation builds off the game-theoretic logic of how group-based norms are enforced and sustained in equilibria. In standard models of norm enforcement, agents are incentivized to abide by norms because others who witness the norm violation punish the norm violator, and those who fail to punish when expected to are themselves subject to similar social-costs (Boyd & Richerson, 1992; Mathew, 2017). This recursive logic can sustain arbitrary norms in equilibrium, but often sustains norms that depend on group membership, such as requiring cooperation with co-religionists (Richerson et al., 2016). Importantly, which boundaries matter and who is considered a member of that group is itself part of the norm, and can be self-enforcing the same way norm compliance might be. For instance, if everyone else treats religion as the defining feature of group membership, and everyone considers you to be a member of our religion, I might be sanctioned for not cooperating with you, and so will find it in my interest to do so. Also, importantly, the grouping need not be based on anything "real"; it simply needs to promote a shared understanding of who is and isn't a member and therefore to whom the norms apply.

By this account, the historical myths described in the target article are attempts to define group membership or shift who is ingroup along these lines. So long as the narratives create a shared understanding of the boundary and of the associated norms for treating ingroup and outgroup members, they can be impactful, even if nobody presumes the narratives are accurate reflections of recent history or current interdependence.

Consistent with this account, groups coalesce around all sorts of factors – religious, national, occupational, or class-based interest groups, often overriding shared ancestry, history, or actual interdependence. Confronted with the international diversity of pilgrims in Mecca, Malcolm X, till then a Black nationalist, proclaimed Islam as "the one religion that erases from its society the race problem" (Malcolm & Haley, 1990), highlighting how religion can override ancestry-based identities. Ethiopian Jews were granted citizenship and transit to Israel, illustrating that a lack of recent shared history can be easily overlooked, even in a non-proselytizing religion. Birth-right citizenship laws demonstrate that neither notions of shared ancestry nor history are necessary for state building. International workers movements mobilized working class people living across oceans. There is no real interdependence among the millions of strangers in each of these social categories – a worker might help out another worker out of "class solidarity" even if they have no chance of seeing each other again and even if her benevolent action isn't going to meaningfully impact the class system.

The fact that group boundaries are publicly broadcast and that membership is often construed as discrete is also consistent with our preferred explanation (Hoffman, Yoeli, Dalkiran, & Nowak, 2020; Hoffman & Yoeli, 2022). Because a shared understanding of group-boundaries is imperative, it is not surprising that mythologies tend to be propagated in highly public forums (e.g., public schools, citizenship ceremonies, or sports arenas), and reinforced with highly visible practices (e.g., anthem singing, ritualized praying, or wearing union membership buttons). Furthermore, the need for agreement about group membership can explain artificially discretized boundaries such as those created by one-drop laws (Jordan & Spickard, 2014), all-or-none rules of religious and national membership, and corporate lineages that discretize genetic relatedness (Alvard, 2011). If interdependence were all that mattered it's not clear why artificial discretization would be necessary. Likewise, if designing a myth to be a superstimuli for interdependence-detecting cognition were all that mattered, one would not need to ensure group membership was so publicly visible; it would only matter that individuals be *privately* informed, or misinformed, about whose welfare they depend on.

Finally, myths about shared ancestry and history may nonetheless commonly define group boundaries because societies have developed in a patterned way. Early forms of political organization were likely kin-based lineages, and as societies expanded they tended to take over, or merge with, neighboring groups. This means that shared ancestry and histories would often co-vary, even if imperfectly, with geography, location, institutions, cultural beliefs, and social-networks. This underlying structure provides functional benefits (e.g., pre-existing organization, coordinated expectations, efficient information flow) to defining group boundaries along such lines (Moya, 2023; Moya & Boyd, 2015). Historical myths may also provide a convenient shorthand for a set of norms governing ingroup interactions that are analogous to those for pre-existing ancestry-based social groups. However, we suspect that as larger-scale societies emerge and institutions evolve, narratives about ancestry and history become less frequent means of defining group boundaries.

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The social identity approach offers a more parsimonious and complete explanation of historical myths' function and characteristics

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Abstract

The social identity approach offers a more parsimonious and more comprehensive explanation for historical myths' assumed coalition-building function than the target article's proposed mechanism based on fitness interdependence. Target article's assertion that social identity theory cannot explain certain characteristics of historical myths is based on a narrow interpretation of the social identity approach.

The target article attempts to explain why groups create and maintain historical myths about their ancestral past. It provides a functional explanation and argues that historical myths are strategically produced by clever individuals to signal fitness interdependence to the group members and, by that, motivate them to commit to the group. The full model proposes a process in which historical myths first signal continuity, which, in turn, signals sustained cohesion and cooperation, which, in turn, cues fitness interdependence, which, in turn, motivates coalitional investment. The argument that historical myths' function is coalition building is convincing. The social identity approach, however, provides a more parsimonious, more complete, and empirically better-supported explanation of how historical myths serve coalition building – without a central role of fitness interdependence.

In a social identity-based explanation, the continuity represented in the myths boosts social identification, which, in turn, increases the members' commitment to and solidarity with the group. The empirical evidence supporting this explanation and testing every step in the process is robust. Perceived continuity boosts identification with one's group (Sani et al., 2007; Sani, Bowe, & Herrera, 2008). Identification, in turn, increases commitment to and cooperation within groups (Ellemers, 2001), even in troubled times (Haslam et al., 2006). A wealth of research testifies that a salient social identity encourages people from the same group to seek agreement (Haslam, Oakes, Reynolds, & Turner, 1999), coordinate their behavior (Turner & Oakes, 1989), and collaborate with each other (van Knippenberg & Ellemers, 2003). The mere idea of group membership is enough to elicit a sense of duty to help the group and fellow group members (Baron, Ritov, & Greene, 2013). The critical characteristic of historical myths is the long, continuous group history, which, according to the social identity approach, is sufficient to promote identification with and then commitment to the group. According to the target article, this critical characteristic of long history is just a proxy to signal cooperation and, eventually, fitness interdependence.

Social identity and social categorization theories can render historical myths effective through additional mechanisms, too. Made salient by the long group history, social identity leads to depersonalization and allows group members' perspectives to become unified and interchangeable with other group members (Turner, 1982). This is what can create the link between past and present members, and this is how the myths' reference to ancestral cooperation can impact motivation today. In addition, sustained intergroup cooperation depicted in historical myths highlights intragroup similarity, which induces self-categorization with the group (Branscombe, Ellemers, Spears, & Doosje, 1999) and can thus prompt behaviors more in line with the perceived (and desired) group norm of cooperation (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987).

Through the common ingroup identity model (Gaertner & Dovidio, 2000), the social identity approach can also explain the coalition-building function of historical myths not just within but between different groups. Historical myths can tell a story of a shared origin of two groups and, through that, attempt to recategorize members of the two groups as also part of an overarching superordinate group with the ensuing superordinate group identity.

The target article argues that the observation that historical myth production is particularly active when groups change by "fission and fusion" supports the claim about the unique role of fitness interdependence cues. But such times of "fission and fusion" are clearly times of group discontinuity. Perceived group discontinuity is an identity threat that motivates people to defend their identity. Leveraging ancestral history appears to be an effective approach. Research shows that existential threats to the group motivate the feeling of collective self-continuity, explaining both ingroup protection and negative outgroup attitudes (Smeekes & Verkuyten, 2013), and perceived continuity can indeed reassure against identity threats (Jetten & Wohl, 2012).

The target article claims that social identity theory cannot explain all the typical characteristics of historical myths, like the role of "ancestral origin." This view stems from looking at social identity merely as a tool for self-esteem manipulation or a remedy for existential threat. Social identity, however, encompasses different motives, including continuity, meaning, and distinctiveness motives (Vignoles, 2011). The length of the group's existence signals continuity and, as the authors say, "perennial entity." Such a perennial entity is an ultimate entitativity cue, showing that the group is a real, meaningful entity, and such perception comes with an increased sense of unity, similarity, interaction, and cohesion within the group (Campbell, 1958). Empirical findings confirm that continuity increases the group's perceived entitativity, which then boosts social identity (Sani et al., 2008). In addition, people want their groups to be distinguishable from other groups, and the lack of perceived distinctiveness is a form of identity threat (Branscombe et al., 1999).

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A unique ancestral myth can be the perfect response to such distinctiveness motivation.

Signaling fitness interdependence can still be a functional component of historical myths, even if not their universal defining feature. For example, while the social identity approach may sufficiently explain how historical myths increase current members' commitment, encourage their support for change, and facilitate the merging of different groups, fitness interdependence cues can be mostly useful when recruiting prospective individual members from the outside. Exploring the possible interaction between social identity motives and fitness interdependence could also be fruitful. While those highly identified with their group should less likely be influenced by fitness interdependence cues, weakly identified members may be more susceptible, receptive to, and, therefore, more likely to be strategically targeted by the myths that utilize them.

In summary, to the extent that historical myths represent a unique cultural phenomenon that serves universal social and societal functions of coalition building, the social identity approach offers a more comprehensive explanation for how historical myths work compared to the proposed model solely based on fitness interdependence.

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Past glories feel good but creative minorities push us forward

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Abstract

Historical narratives can satisfy basic individual psychological needs. However, an over-reliance on a group's past can marginalize those who think differently – thus, homogenizing the culture and stifling creativity. By revising narratives to balance the power of collective narratives with the richness of individuality, we foster groups that encourage varied identities.

Sijilmassi et al. offer an evolutionary explanation for historical myths within a group. The more important a story is about the origins and challenges of a particular group, the more this story is endorsed and then shared. As the story spreads, the group becomes bigger and stronger. Foundational myths can, thus, serve as a group-level adaptation. How? Such stories, built around past events, help us make sense of the world. They guide us on what to believe, what to value, what to prioritize, and how to decide among competing options. By adopting shared values and behaving in ways that earn rewards (and avoid punishment), we shape our identities – strengthening bonds with relevant social groups.

But there is another function to these stories: They promote collective action. Narratives of an ingroup's merits and an outgroup's faults can drive individuals toward protests, conflict, even war. To achieve notable collective feats, we need a shared vision, rooted in a common past and projected into a shared future. By celebrating the triumphs of ancestors and the communities that nurtured them, we allow the past to powerfully contribute to the future.

Here, we offer a complementary perspective to the authors' central premise. Like any powerful entity, historical narratives emerge with wide-ranging benefits. Beyond group benefits, historical stories offer individuals a sense of meaning, with rippling effects on psychological and physical well-being. However, there are downsides – marginalizing dissenters and inhibiting creativity.

The psychological benefits of collective narratives

Honoring and sharing historical stories transmits a sense of belonging. Recent research points to how inducing a strong sense of belonging (whether through story or something else) within a social group offers a simple, psychological intervention for enhancing purpose in life (e.g., Lambert et al., 2013). It is wonderful that some of the population can feel part of a long-lasting,

potent legacy. From what we know about purpose, people connecting with a story feel more empowered, more goal-driven, and show greater perseverance when confronted with obstacles (Kashdan, Goodman, McKnight, Brown, & Rum, 2024).

Group members whose personal identity aligns with the group's beliefs, values, and standards typically gain the strongest sense of belonging from these historical narratives (e.g., Livingstone & Haslam, 2008). Those who fall outside that identity often lacked power or influence during the narrative formation. Benefits abound for the ingroup members but at some cost to individual members.

Who and what is excluded by collective narratives

Collective narratives, while serving as a powerful binding force within societies (e.g., Bliuc & Chidley, 2022), can inadvertently stifle individuality and creativity – creating a homogenized culture that discourages dissent and alternative perspectives. A reliance on shared stories and histories may lead to the marginalization of outgroups and even ingroup members who dare to think differently (Marques & Paez, 1994), ultimately fostering an environment of exclusion rather than inclusion. Moreover, these narratives can prematurely dictate identities, particularly for youth still in the process of personality development.

An emphasis on the ingroup's positive features, as reflected through stories from the past, feels good. A sense of pride from shared stories serves as a binding moral foundation (e.g., Graham et al., 2013) – associated with being less open to change (Feldman, 2021), lower creative self-beliefs (Kapoor & Kaufman, 2022), and poorer creative performance (Kapoor, Mahadeshwar, Rezaei, Reiter-Palmon, & Kaufman, in press). Those who feel good, even psychologically satisfied by what one's ancestors accomplished, might suffer in planning and foresight.

Collective narratives often glorify the heroic feats of the dominant majority culture, leaving those on the fringes overlooked. Research shows that those who feel stronger ties to those binding features of the dominant majority culture are also more likely to be homophobic (Barnett, Öz, & Marsden, 2018), skeptical of racial injustice (Goff, Silver, & Iceland, 2022), and biased against immigrants (Lasala Blanco et al., 2021). These results suggest that those who feel the most included are the most exclusionary to the marginalized (for whatever reason). Consequently, these marginalized individuals may not share the same sense of pride or any positive reaction to stories of legendary triumphs.

The subsequent costs of these feelings of exclusion impact the entire group, not just the marginalized. Those who can identify with the majority culture and history have the luxury of not needing to take risks and innovate. Yet those without the privilege of a most-favored status must stay flexible and open. They cannot be intolerant of ambiguity or need too much structure or closure. To survive lower-resourced environments, they need to be curious and use their imagination (Kaufman & Glăveanu, 2022). In a world where many minority groups may show deficits in measures of achievement developed by the dominant culture, creative ability is consistently an equalizer in most high stakes assessment situations (Luria, O'Brien, & Kaufman, 2016); creative self-beliefs may be a specific strength in underrepresented groups (Kaufman, 2010). Ethnic and cultural minority diversity in group composition has been shown to enhance overall creativity and innovation (Hundschell, Razinskas, Backmann, & Hoegl, 2022). When people in a group disagree (Nemeth, 1986), ideas converge only if both parties are part of the majority. When the dissent comes from minority voices (and is persistent), however, more discussion and thought takes place (Kashdan, 2022). As a result, a diverse group that is willing to put in the effort will see its creativity notably increase (Van Dyne & Saavedra, 1996). In contrast, a homogenous group that is too focused on the past may leave its most glorious accomplishments in the rear view mirror.

Mastering the art of storytelling

Sijilmassi et al. left out important positive and negative consequences of shared historical myths. Additionally, there is much to be said about how stories can be intentionally revised to maximize benefits and minimize harm. Better storytelling, we argue, comes with greater responsiveness to individual differences. Innovation in groups often springs from someone questioning unhealthy societal norms that require change. Healthy, enduring groups capitalize on complementary strengths for shared aims; the risk-takers hunt for growth opportunities while the cautious watch for threats. Telling and sharing stories from varied perspectives allow more people to see themselves as part of the larger group, fostering both individuality and unity.

The cost of collective narratives can range from minimal to immense: The potential for innovation is curtailed, diversity of thought is suppressed, and the richness of individual experiences is overlooked. As we navigate our shared future, it is crucial to recognize the value of individual and underrepresented narratives within the collective, fostering a society that encourages the exploration of varied identities.

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Mythos in the light of evolution

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Abstract

This commentary adds elements of analysis from the new evolutionary sociology that might help to support the mythologic hypothesis. It discusses the likelihood of a more generalized processer rather than exactly evolved psychological mechanisms, the consequences of bottlenecks, and the importance of utilizing molecular, fossil, and primate data in the authors' research program.

Mythology commands marginal interest today, although myths still tantalize the twenty-first century mind as it is commonplace knowledge that human societies are underpinned by compelling narratives about their origin and history. Yet, as Hallowell (1947, p. 544) remarked years ago, "This marginal position…is not due to the inherent nature of the material but to a failure to exploit fully the potentialities of such data." In "Our Roots Run Deep," the authors exploit this potential, and it will hopefully spark a revival of interest in the function and nature of historical myths. After a literature view, the authors conclude that it has never been successfully explained why humans find historical myths so appealing, especially creation myths and the origins of nation-states. Nor has anyone explained why historical myths still play important roles in national discourse or unite individuals in both small- and large-scale societies. So, the objective of their essay is to explain the "exact psychological mechanisms by which information about the remote collective past becomes relevant to humans."

The article addresses the following research question: "humans need committed and numerous group members to engage in productive collective action and prevail in conflict." How do you persuade them to cooperate? Answer: By special purpose cognitive mechanisms and making effective use of cues to activate *fitness interdependence*. In small-scale societies unity is easy, they note, because of face-to-face interactions and shared genes. But when humans share a common culture but minimal genetic relatedness, how do you persuade them to engage in collective action with mostly strangers? The authors propose that in nation-states this is done by strategic (and foxy) agents or myth-makers who compete to attract new recruits by using historical myths and capitalizing on the allegiance of citizens to a shared homeland. What makes historical myths so compelling, they say, is that they are cleverly designed by these myth producers to activate psychological cues to inherent and specific cognitive devices; and this is why historical myths can mobilize the masses and make large-scale societies possible.

A nice theory but is it true? Do precise hard-wired cognitive devices for detecting fitness-interdependence exist? The target article does not go back in evolutionary time, missing out on fossil, molecular, and other relevant data to help buttress their hypothesis. For example, there are eight billion of us alive today but, surprisingly, we have little genetic diversity – indeed, less than any other primate species (Barbujani, Shirotto, & Tassi, 2013). This peculiarity is linked to bottleneck events in hominin evolution, especially a severe one between 930,000 and 813,000 years ago, that seemingly wiped out 98.7% of human ancestors, leaving a *Homo* population of fewer than 1,200 breeding individuals (Hu et al., 2023). Such little variability in the human genome supports the belief in a pan-human nature. Indeed, we should not be surprised that when humans are confronted with problems of fitness and survival, populations work out relatively similar solutions – like using historical myths (a cross-cultural universal) to activate feelings of loyalty and unity. Cladistic analysis, comparative neuro-anatomy between great apes and humans, and primate data can also bring insights into humans' evolved biology (see Turner & Maryanski, 2024). For example, the depiction of self-interested myth-producers who use Machiavellian manoeuvres to manipulate others is not unique to humankind. Chimpanzees, albeit in an elementary way, also employ Machiavellian maneuvering to achieve an end and purely for self-interest. (Maclean & Hare, 2012; Schmeltz, Calland, & Tomasello, 2011).

How domain-specific are the cognitive devises proposed? Natural selection is a conservative force, so a cognitive perception of *fitness interdependence* may stem from a more general processer that activates all kinds of collectivism – like worldwide religions. Sodalities (a cross-cultural universal) also anchor social formations organized around voluntary ties for collective activities. And, what of rabid sport fans who wear team logos and even undergo ceremonial rituals? Devotees are fiercely loyal to their team, which activates a license to communicate with other devotees, and, at times, whip up conflict toward members of other teams. Indeed, historical myths, religions, sodalities, and sport teams all rise above the narrow confines of genealogical kinship, often use competitive recruitment, and cultural objects (e.g., a sport mascot like the USC Trojans), or a task-oriented collaborative to generate the aura of a fitness interdependence that transcends individuals. Indeed, it would seem that fitness interdependence underpins all sorts of diverse social formations, indicating a more widely applicable cognitive mechanism at play rather than "exact psychological mechanisms."

Finally, we are puzzled by the authors' statement that "the cultural evolution of historical myths does not require any form of functionalism." Functionalism refers to a process or a *need* for integration or cooperation. The intent of the authors is to "show that the cultural success of historical myths is driven by

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a specific adaptive challenge for humans: the *need* to recruit coalitional support to engage in large scale collective action and prevail in conflicts." This is a classic functional orientation because the *need for coalitional support* then operates as a selective mechanism, or a selection pressure. As coalitional support (the effect or end result) cannot produce its own cause, the authors propose the existence of preexisting mechanisms that activate fitness interdependence. Still, in the light of evolution, the reality of these evolved proclivities must be taken on faith until the selection pressures that led to these evolved cognitive devices are empirically supported in some fashion.

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Myth as model: Group-level interpretive frameworks

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Abstract

I argue that while recruitment might explain some of the design features of historical myths, origin myths in general more importantly provide shared narrative frameworks for aligning and coordinating members of a group. Furthermore, by providing in-group members with shared frameworks for interfacing with the world, the contents of myths likely facilitate the selection of belief systems at the group-level.

The account proposed by the target article argues that the design features of historical myths are cultural tools primarily for facilitating coalitional recruitment in the context of nation states. While such an account makes sense in light of some design features of historical myths, I question why recruitment might exapt myth in particular. I argue that the structures of myths themselves serve a role beyond recruitment, serving as meta-heuristics for coordination and that this primary function can be found not only in modern nation-states, but in the smaller structure of fictive kinship groups, world religions, and even scientific traditions.

Given that the account presented by the authors must be exaptive, as the origins of the modern state occurred only some 6,000 years ago, a challenge for the framework is identifying the cognitive ur-mechanisms which lend humans toward constructing historical myths. The universal cross-cultural presence of myths, particularly origin myths, and their attestation through history in all of the world's major religions and societies at all scales indicate that the employment of myths in group-specific contexts must predate the origins of nationalism, itself only a 200-year-old phenomenon, and, indeed, states themselves (Gottschall, 2012). A core question then is why human groups possess origin stories in general, external to their use in the context of state-building.

The proposal I defend is that group-specific myths serve not primarily as recruitment mechanisms, but as coordination mechanisms for members of an already assumed in-group. By providing group members with a shared attentional framework, origin stories create scaffolding for the construction of common and shared interpretive frameworks (Polanyi, 1952). Hence, myths and origin stories themselves are not content neutral nor invariant across societies, but instead in their culture-specific formulations serve as scaffolds for ideating shared models of the world, in ways that have both individual and, more importantly, group-level fitness outcomes.

In a general light, myths can be viewed as providing meta-heuristics for ensuring that members of a common group follow the same norms, envision the world with a shared ontology, and respond to new problems in the same way. One strong objection is that if this framework were correct, why would group members not simply tell a true, non-mythical story rather than generating a myth (Dubourg & Baumard, 2022)? The answer is that the contents of myths generalize *across* contexts by providing tacit, specifically inarticulable assumptions about the world. As famously written by GK Chesterton in his now-famous appeal to irrational thought (1925), "Father Christmas is not an allegory of snow and holly; he is not merely the stuff called snow afterwards artificially given a human form, like a snow man. He is something that gives a new meaning to the white world and the evergreens, so that the snow itself seems to be warm rather than cold." By providing vague frameworks and bracketing our interpretation of events in the same ways, mythical narratives, taken not literally, but nevertheless shared as common frames of reference, allow groups to "fill in the gaps" in out-of-context situations in the wider world, either in the form of tacit knowledge generation (Miton & DeDeo, 2022) or by referring to them in the form of explicit analogies (Brand, Mesoudi, & Smaldino, 2021). In this way, old stories serve as common guides to new problems by narrowing the space of possible solutions and providing groups who employ them with common cultural attractors (Sperber, 1996).

Foundational stories then provide not only the individuals who are convinced by them with groups, but group strategies to the groups which have adopted them. It is not just selection on individuals to join groups, but on the content of shared stories, which allow for group survival (Smaldino, 2014). It is non-trivial and relevant considering, for example, that the flags of the nascent Continental Navy during the US Revolutionary War were embroidered with the quotes of John Locke and that the flag of the nascent Islamic State was inscribed with the *shahada*, as each flag represents completely different frameworks, mythologies, ontologies,

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and ideologies relevant to the bannerman hoisting it. An alternative framing of the author's question, "why stories about the Gauls are relevant for French solidarity today," posed by historian Ward-Perkins (2005), is why the annual prize awarded for service toward European unification by the European Union is the Franks-inspired *Prix Charlemagne* and not the Latin-inspired *Corona Civica*. It is perhaps because one inspires imagery of diverse confederation and another of militaristic imperialism.

In addition to the case of modern nation states, the framework provided by the authors can be extended to any wider context where group coordination is necessary and recruitment desired. Religions, corporate mission statements, and bespoke political coalitions of all kinds possess shared foundational narratives which align the behavior of in-group members. The names of our Young Turks, Tea Parties, and Green New Deals carry in them almost complete mission statements in the broadest details of their aesthetic choices alone. More controversially, I would contend that shared narratives are present and constitute the core of what we refer to as *theory* in scientific practice, which is comprised of largely implicit assumptions for aligning the research agendas and shared interests of otherwise independent researchers (Kuhn, 1962; Polanyi, 1962).

Recruitment, therefore, I argue, is only part of the story of why groups, such as states, possess origin stories and may be a more recent part of the story than the more critical role of facilitating group-level coordination. As noted by the economist Hayek (1983), "Only traditions which succeeded in making whole to certain symbolic truth would be led to maintain moral rules whose advantages they never understood.. we owe civilization to beliefs which in our modern opinion we no longer regard as true, which are not true in the sense of science, scientific truths, but which nevertheless were a condition for the majority of mankind to submit to moral rules whose functions they did not understand, they could never explain, in which indeed to all rationalist critics very soon appeared to be absurd."

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The influence of stories including myths of origin

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Abstract

Sijilmassi et al. argue that myths serve to gain coalitional support by detailing shared histories of ancestry and cooperation. They overlook the emotional influences of stories, which include myths of human origin. We suggest that influential myths do not promote cooperation principally by signaling common ancestry, but by prompting human emotions of interdependence and connection.

Although Sijilmassi et al. repeatedly use the term "history," and have "myths" in their title, we suggest their proposal would be strengthened by incorporating more about the importance and influence of stories. We agree with the authors of this interesting article that myths use cues of shared history and experiences of interdependence to help promote human cooperation. Here, we take a closer look at myths of shared history in different parts of the world. In this way we extend Sijilmassi et al.'s theory and suggest that the path from myth to cooperation lies beyond shared ancestry. We suggest that it is the sharing of human emotions that is most impactful.

Consider the book of *Genesis* (e.g., Rosenberg & Bloom, 1990), which is not mentioned by Sijilmassi et al. It has had huge effects in many parts of the world through Judaism, Christianity, and Islam. All three religions tell the myth of a god creating a man and a woman, with Eve as the universal mother. Although these religion-based groups are separate, even competitive, what has helped to coalesce each of them is its own myth. When new allegiances have formed, for instance when Christianity separated from Judaism, the new coalition was prompted by changes in its stories to those about Jesus. In Islam, stories formed about the influence of the prophet Muhammad. Myths of origin offer shared beliefs with these stories being told and retold in synagogues, churches, and mosques. Parts of these stories also serve as bases of emotionally engaging cultural rituals and practices that enhance members' shared engagement with each other.

Sijilmassi et al. recognize myths as foundational to the cultural fabrics of societies. However, the divergence of stories as told by three competing religions, which share a common history through Eve, counters their argument that it's basically a shared ancestry that promotes cooperation. We suggest that the authors consider the emotional influences of myths. Stories can give people a sense of belonging (Baumeister & Leary, 1995). For myths to be retold over generations, motivation occurs not principally by shared lineage, but also by the evoked emotions that interconnect people, and give them a strong sense of membership in their societies.

Empirically, with evidence from several research groups, the influence of stories, as compared with explanations, has been found to include a greater sense of empathy and better understanding of other people whom we know (Mar, 2018; Oatley, 2016).

Wright (1992) put it like this:

> Myth is an arrangement of the past, whether real or imagined, in patterns that reinforce a culture's deepest meanings and aspirations … Myths are so fraught with meaning that we live and die by them. They are the maps by which cultures navigate through time (p. 5).

Portrayals of emotions occur in myths of origin from various cultures. *Genesis* is thought first to have been written as fictional story some 2900 years ago by a woman called J (Rosenberg & Bloom, 1990). Her account includes the origins of humans' emotional suffering caused by the first act of human choice: To eat a fruit of a tree that would enable her to know the good and the bad, with a punitive reaction to doing so by a male god. Over the next few centuries, J's story was changed and redacted to become a myth that became central to Judaism, Christianity, and Islam. Contrary to what Sijilmassi et al. propose, it was about choices made by humans in general, rather than by shared ancestry.

Another example is from China. Here, the goddess Nüwa molded humans out of yellow soil due to her feelings of loneliness (Schipper, Ye, & Yin, 2011). From the laughter of the first humans, Nüwa felt joy; from this she created more humans. In recognizing their loneliness, people seek out others for company, connection, and coalition. Once again, rather than ancestry as Sijilmassi et al. propose, we suggest that people derive the benefit of joy from the presence of others, as expressed in this myth.

Kotovych, Dixon, Bortolussi, and Holden (2011) have shown that, when people have to make inferences as they read a story, they experience more insight into characters than when they are told directly about characters' personalities. This invitation to make inferences may be present in a myth of origin from India. This story is told through a hymn, entitled Purusha, in *Rigveda* (Anonymous, 1500–1000 BCE), the oldest Hinduist text. It tells of a giant man, dismembered and sacrificed to create everything on earth, including humans. Below is an excerpt with alternative translations in brackets.

> When they apportioned the Man, into how many parts did they arrange him?
> What was his mouth? What his two arms? What are said to be his two thighs, his two feet?
> The brahmin (priest) was his mouth. The ruler was made his two arms.
> As to his thighs – that is what the freeman (merchant) was. From his two feet the servant was born.

Once again, rather than the emphasis being on shared origins, as Sijilmassi et al. propose, this myth motivates people of the same social group to work together since they depend on each other to make up each specific body part, and that cooperation among social groups is needed to make up the whole of Purusha.

We believe this myth motivates coalition beyond its explicit descriptions of social harmony. We attempt to infer emotions from the story. Imagery of a body taken apart may evoke pain. This kind of feeling, attached to the idea of sacrifice for future generations, may also evoke guilt and gratitude, perhaps as felt toward one's mother for the gift of birth. Gratitude can motivate people toward acts of kindness and cooperation within their culture-based societies.

Taken together, myths not only help establish specific cultures but also convey, generally, human experiences of suffering, companionship, and sacrifice. Such familiar experiences evoke emotions of pain, joy, and gratitude. These emotions help people understand and identify with one another, prompting interest in our efforts to live together.

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The Trojan horse of historical myths: Emotion-driven narratives as a strategy for coalitional recruitment

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Abstract

Sijilmassi et al. offer a cognitive account of historical myths, which they present as a cognitive technology designed to recruit coalitional support. We argue this account is incomplete, and that a comprehensive explanation of historical myths must include a central role for human emotions. In particular, emotion-driven narratives have the capacity to recruit coalitional support, which is critical to large-scale human cooperation and social cohesion.

Sijilmassi et al. propose that historical myths – shared narratives about the ancestral past – are cognitive technologies designed to recruit coalitional support, for example, to prevail in conflicts. They argue that historical myths evolve to be fit-for-purpose; that is, over repeated transmission, the myths adapt to human cognition by tailoring their content for persuasion (to join the coalition) and transmission (as a means of recruiting others). An analogous cultural evolutionary process has been used to explain how language evolves to fit the human brain

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(Christiansen & Chater, 2008). So, according to Sijilmassi et al., cognitive processes shape historical myths. This position echoes Aristotle's notion of "Logos"; a persuasive appeal that relies on clear, logical arguments supported by facts, data, and reasoning.

We note that Sijilmassi et al.'s account of historical myths does not include a role of human emotions. This is at odds with Aristotle's notion of "Pathos"; a persuasive message that appeals to the audience's emotions, by eliciting feelings such as sympathy, anger, frustration, or amusement. We believe this omission renders Sijilmassi et al.'s account of historical myths, and their ability to recruit coalitional support, incomplete. In this commentary, we argue for a role for emotion from two vantage points: Research showing that people's emotions guide their decision making, and by reflecting on the examples of historical myths reported by Sijilmassi et al., and making the case that the emotions they elicit are likely to have driven their ability to recruit coalitional support.

A seminal study by Schwarz and Clore (1983) examined if judgments of happiness and life satisfaction are influenced by a person's mood at the time of the judgment. In one experiment, a happy or sad mood was induced by asking participants to vividly describe a recent happy or sad event in their life, and in another experiment a happy or sad mood was induced by interviewing participants on a sunny or rainy day. In each experiment, participants self-reported greater happiness and life satisfaction when in a good mood than when in a bad mood. These findings indicate that people use their current mood state to inform their judgments, a phenomenon known as "affect-as-information." Since then, research on emotion and decision making has gained widespread interest and investigation among researchers. Today, the consensus among psychological scientists is that, "emotions are, for better or for worse, the dominant driver of most meaningful decisions in life" (Lerner, Li, Valdesolo, & Kassam, 2015, p. 801).

Many of the historical myths discussed by Sijilmassi et al. – for example, those that concern historical grievances or praises – and the coalitional support they elicit, are likely to be driven by the emotions they evoke. Take for example the complex myth of the Trojan War in ancient Greece, which recounts the legendary conflict between the Greeks and the Trojans over the abduction of Helen by a Trojan prince. The survival and transmission of this myth is likely driven by the strong positive and negative emotions it evokes, including heroism, honor, betrayal, and tragedy. Myths often elicit coalitional support by resonating deeply with the collective emotions and identity of a community. In the case of the Trojan War, the emotions evoked, such as admiration for bravery, sympathy for victims, and outrage at injustices, powerfully shape cultural attitudes, values, and personal and collective identities. These emotions not only influenced how ancient Greeks interpreted their history but continue to inform contemporary perceptions of conflict, sacrifice, and shared experiences which seal their collective memory and identity.

This commentary extends the insights of Sijilmassi et al. by emphasizing the central role of emotions in shaping historical myths and their ability to recruit coalitional support. In various collective emotional gatherings and societal upheavals – ranging from natural disasters to political revolutions – people experience intense emotions, both positive and negative. These shared emotional experiences become ingrained in collective memory, laying the groundwork for the development of historical myths. Research by Méndez Casas et al. (2023) and Pennebaker, Páez, and Rimé (1997) supports this idea, illustrating how collective emotional experiences contribute to the formation of narratives that unite communities and inform their understanding of historical events. Moreover, during real-world collective gatherings, specific social psychological mechanisms, such as the social sharing of emotions (Rimé, Bouchat, Paquot, & Giglio, 2020) and emotional synchrony (Pelletier, 2018) promote prosocial behavior like cooperation, and trust. These phenomena foster emotional connectedness and synchronization within groups, strengthening social bonds and facilitating cooperation.

By emphasizing the strong connection between emotions and decision making, and by highlighting the powerful emotions elicited by historical myths, our commentary aims to extend Sijilmassi et al.'s cognitive account of historical myths. Historical myths, as a particular form of storytelling, represent universal cultural elements where cognition and emotions are woven together, thereby offering prominent functions for large-scale human cooperation and social cohesion. In closing, we argue that the framework proposed by Sijilmassi et al. can benefit from incorporating the emotion-driven narratives as a strategy for recruiting coalitional support.

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Homo historicus: History as psychological science

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Abstract

Historical myths are indeed a mystery in need of explanation, and we elaborate on the present adaptationist account. However, the same analysis can also be applied to motivations to produce and consume history in general: That humans produce and consume history is also a mystery in need of psychological explanation. An adaptationist psychological science of history is needed.

As we mourn the passing of John Tooby, it is worth noting one of his many under-appreciated (in addition to his many appreciated) insights: That historical events do not face a replication crisis, and that insofar as the historical record is accurate, any science of human nature and psychology had better have a causal account of what led up those events. John's recurring insight, echoed in the well-researched target article, is to use real-world outcomes as proper *explananda*, the thing to be explained.

And the target article delivers. To see historical myths as a puzzle, and to be clear-minded about their recurrent features and whether existing accounts explain those features, is a deep virtue. Sijilmassi et al. posit that historical myths function as coalitional recruitment technologies shaped to advertise high fitness interdependence among sets of agents and provide comprehensive "historical" evidence to support their arguments. We do not disagree with this analysis, quite the opposite, but we do think that the deep conceptual analysis underlying the present account can be taken further, in several directions. And in the process, we would like to head off a possibly overly facile reading of their valuable work.

Science, like religion, traffics in mysteries, and it is instructive to articulate Sijilmassi et al.'s mystery: It is events of the distant past "with much less obvious impacts on current affairs" that constitute the puzzle or mystery:

> Historical myths, by contrast, are especially puzzling because they commemorate a very distant past or aspects of the group's history with much less obvious impacts on current affairs….Hence, in the following, we focus on accounts that explicitly try to answer the main puzzle of historical myths, which is why a shared history is perceived as an essential condition for group cohesion in many societies (sect 2.1, para. 3).

These non-obvious phenomena are then contrasted with phenomena with more straightforward explanations:

> The discussion of these mechanisms highlights the specificity of historical myths compared to other politically salient information about history. While we acknowledge the importance of the latter, they were not included in the scope of this article. The main reason is that they have quite straightforward explanations. In all of the listed alternative accounts, the historical material has a relatively clear connection to pressing issues in the present (sect 2.1, para. 3).

We agree with the spirit here, but not the letter. From the perspective of what social scientists deem provocative enough to study, Sijilmassi et al. are indeed right: They bear a burden of arguing for why historical myths are a puzzle at all. And so, it is fair to contrast distant myths with more straightforward phenomena.

But, from the perspective of how the underlying psychology works – the design of the proximate psychology, to put it in Tinbergian terms – there are no straightforward explanations of how even phenomena with "straightforward explanations" work. Analogously, it is no mystery why humans can see rocks and cliffs, but how they manage to do this, and thereby avoid running into and over them, is a mystery, and one aided by adaptationist analysis.

Although an apparently minor point, we would suggest that from this perspective of worrying about the psychology, one is forced to reframe the entire issue as mysterious: Namely, the human capacity for history is deeply psychologically mysterious. Humans appeal to the past, and they communicate and receive information about past events from others. This sets up a set of selection pressures in the design of systems to craft motivations to broadcast and then again evaluate and respond to historical information.

Several points follow from this psychology-first point of view. First, historical myths are on this view grounded in more fundamental principles of cognitive adaptations. These may include *collective situational templates* (e.g., humiliation, retaliation): Psychological templates which play an important role in recruiting and maintaining allies by creating an immediate understanding of situations. For instance, the "Retaliation" template comes equipped with built-in intuitions about the rationale for action, the risks of inaction, the inherent benefits of negative reciprocity, and the acceptability or even praiseworthiness of (defensive) aggression. Consequently, appeals to something like "Retaliation" create an immediate co-registering of the fitness interdependencies at stake. Cultural myths are then elaborated cultural technologies built upon templates such as these.

Second, focusing on the proximate psychology allows us to derive predictions about effective coalitional recruitment strategies. For instance, variations in payoffs between offensive and defensive aggression have shaped the development of proximate mechanisms that reflect these differences (De Dreu & Gross, 2019; Lopez, 2017). As such, defensive aggression is easier to coordinate and morally justify to allies (Pietraszewski, 2016). So, when the goal is to recruit militant allies, one should expect privileging of justifications over offensive ones. Indeed, such framings are frequent among violent extremists, where a process of "typification" – modeling a personal plight as a specific instance of a prototypical collective situation – is common (Moncrieff & Lienard, 2024).

Relatedly, Sijilmassi et al. also discuss how self-interest often motivates the production of historical myth, and here we would suggest that by evoking collective situational templates, agents may at times conceal their underlying self-interests by framing individual actions in ways that appeal to a broader audience (e.g., actions are "for the greater good"). Deceptive agents may thereby portray themselves as altruistic and cooperative while covertly pursuing aggressive, self-serving actions. In contrast, agents with already broad support might communicate straightforwardly, openly justifying their aggressive actions with confidence, reflecting a clear alignment with their self-interests. The motivation to seek out reasons and justifications to mask self-interest may thus be integral components of coalitional recruitment psychology. For instance, envy not only drives motivations to eliminate perceived competitors, but it also conceals itself by framing situations as coalitional, prompting a search for reasons and justifications to align with others (Moncrieff & Lienard, 2024).

Third and finally, an adaptationist task analysis of history – of what an evolved organism would need to do to create and maintain representations of past events – is sorely needed to point out

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what to look for within the human mind, and within historical phenomena in general, myths included.

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A terror management theory perspective on the appeal of historical myths

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Abstract

Historical myths are appealing primarily because they provide people with views of life and their role in it as significant and enduring. These worldviews help people manage death anxiety by enabling them to view themselves as part of something great that stretches far into the past and endures indefinitely into the future. We review empirical evidence supporting this analysis.

Sijilmassi et al. propose that people are attracted to historical myths because narratives depicting a long history of shared experience signify present-day fitness interdependence. Though it is plausible that historical myths promote feelings of fitness interdependence, group cohesiveness, and coalitional success, we find it unlikely that this *causes* people to be attracted to them. Though the authors review evidence that people are prone to perceive continuity over time and defining foundational characteristics in their groups, this simply establishes that these phenomena exist and tells us little about their psychological origin or function. The authors provide no evidence that these narratives cause people to perceive current or future fitness interdependence – or that historical narratives are even associated with such perceptions. Nor is evidence provided that perceived fitness interdependence affects the appeal of historical narratives. Politicians and others may indeed appeal to historical myths to promote commitment to groups, claims to lands and resources, and policies to counter perceived threats. However, as the authors themselves note, there are more direct and impactful ways to promote perceptions of the interdependent nature of one's group than referring to events in the ancient past. A compelling explanation of the appeal and function of historical myths requires an analysis of the individual-level psychological needs they serve for both those who adopt them and those who promote them.

Although Sijilmassi et al. acknowledge that social psychologists have proposed that individuals embrace historical myths in pursuit of meaning and self-continuity in order to "compensate for their own finitude," they dismiss this explanation for the appeal of historical myths on the grounds that "it remains unclear why exactly humans have such psychological needs in the first place." *Terror management theory* (Greenberg, Pyszczynski, & Solomon, 1986; Solomon, Greenberg, & Pyszczynski, 1991) posits that human awareness of the inevitability of death gives rise to the potential for anxiety because it runs counter to diverse biological and psychological systems that facilitate individual survival. This anxiety must be managed because it is both highly aversive and likely to undermine goal-directed behavior necessary for survival, reproduction, and prospering. People manage death-related anxiety by maintaining faith in a cultural worldview that gives meaning, structure, significance, and permanence to their lives and attaining self-esteem by living up to standards specified by their worldviews.

Historical myths and narratives are appealing because they help people manage death anxiety by imbuing themselves, their groups, and life in general with meaning and value that transcends one's individual lifespan. They do so by enabling people to view themselves as valuable contributors to something great that stretches far into the past and that will endure indefinitely into the future. Historical myths are important elements of cultural worldviews that promote psychological equanimity by connecting people to the eternal and construing one's group as valuable and virtuous (see Solomon, Greenberg, & Pyszczynski, 2015 for a presentation of archeological, anthropological, and historical evidence supporting this analysis). Negative aspects of one's group's history are ineffective for managing existential terror, and thus tend to be downplayed, spun in a positive light, or outright denied. When negative aspects of group history are acknowledged, they tend to be viewed as part of a redemptive narrative in which the group is progressing toward a better current or future state.

A large body of research provides converging evidence for the theory's central propositions by showing that: (1) Reminders of death (mortality salience) increase commitment to and defense of one's cultural worldview and self-esteem, (2) threats to these psychological entities increase the accessibility of death-related thoughts and boosts to them decrease the accessibility of such thoughts, (3) bolstering self-esteem and worldviews reduce anxiety and anxiety-related behavior. Research has documented the

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role of terror management process in commitment to groups important to one's identity. For example, mortality salience increases attraction to one's group, nationalistic rhetoric, charismatic leaders, and symbols of one's culture. Criticisms of one's group and its worldview increase the accessibility of death-related thoughts. For a general review of terror management research, see Pyszczynski, Solomon, and Greenberg (2015).

There is also considerable evidence specifically supporting our analysis of the role of historical narratives in terror management. Reminders of death increase the appeal of enduring entities, especially those related to one's group. Especially relevant here, Sani, Herrera, and Bowe (2009) found that death reminders increase the perceived continuity of one's group's history and cultural beliefs, and that this mediates the effect of mortality salience on identification with one's group. Castano, Yzerbyt, Paladino, and Sacchi (2002) found mortality salience to increase perceptions of the entitativity of one's group – the sense that one's group has enduring defining features. Research has shown that death reminders increase nostalgic memories of the past and that nostalgia-proneness reduces the effect of mortality salience on death anxiety and defensive responses to mortality salience (e.g., Juhl, Routledge, Arndt, Sedikides, & Wildschut, 2010). Landau, Greenberg, and Sullivan (2009) found mortality salience leads people to view past life events as more significant and to lead those high in personal need for structure to parse their future into clearly defined temporal intervals, while McCabe, Spina, and Arndt (2016) found mortality salience increases the appeal of old but not new objects. Other research has shown that death reminders increase the desire to believe that one's culture is progressing in a positive direction and that bolstering belief in progress buffers the effect of mortality salience on the accessibility of death-related thoughts and negative reactions to criticisms of one's culture (Rutjens, van der Pligt, & van Harreveld, 2009). These studies establish a clear causal connection between death concerns and various indicators of valuing past events involving both oneself and one's group.

This body of research supports the idea that people are attracted to historical myths because of the protection from existential anxiety they provide. People are motivated to spread these myths because broad acceptance within and beyond their group consensually validates belief in them. This, in turn, likely promotes future group solidarity, which further increases the psychological security cultural groups provide and promotes their continued success. Explaining complex social phenomena requires integration of individual- and group-level analyses.

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Myths and prestige in Hindu nationalist politics

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Abstract

Sijilmassi et al. offer a myth-based framework that is particularly useful in understanding the rising tide of Hindu nationalism in contemporary India. We propose that the success of these myths lies partly in drawing upon the evolved human capacity for prestige-based status to induce a sense of belonging and identification with high-prestige Hindu social groups.

Political scientists and pundits alike have marvelled at the extraordinary electoral successes of India's incumbent Bharatiya Janata Party (BJP). In their target article, Sijilmassi et al. highlight the centrality of myths in contemporary coalition formation. We argue here that this approach can be fruitfully applied to elucidate political patterns in India today. This approach is particularly useful in understanding the BJP's successes in the context of the rising tide of Hindu nationalism and chauvinism (*Hindutva*, in contemporary parlance). Sijilmassi et al. supply a framework that can be used to analyse the centrality of myths in the rise of the BJP and its affiliate organizations, collectively known as the Sangh Parivar (Family of Organizations). The Sangh Parivar is headed by the Rashtriya Swayamsevak Sangh (RSS), and its subsidiaries, including the BJP, share the goal of creating a Hindu nation (Basu, Datta, Sarkar, Sarkar, & Sen, 1993; Sarkar & Sarkar, 2016).

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Crucial to the BJP's political and cultural goals are (at least) two myths: The first centres on a millennium-long struggle between "invading" Muslims and "resisting" Hindus (Savarkar, 1928/2003). This myth identifies Muslims as the "other," ignores the possibility that Muslims are as "Indian" as Hindus, and calls upon Hindus to shake off their quiescence and rally against centuries of alleged oppression (Sarkar & Sarkar, 2016; Thapar, 1989). The second myth is that Hindus comprise an undifferentiated social group that has descended from, or at least interacted with, glorious Aryan ancestors (Savarkar, 1928/2003). This myth erases long-standing inequalities of caste, region, and sect that occur within this overly broad conception of Hinduism (Basu et al., 1993; Sarkar & Sarkar, 2016). Together, these myths have helped expand support for the BJP and Hindu nationalism beyond its core constituencies of upper castes and upper and middle classes.

The broad appeal of contemporary Hindu nationalism highlights the need to nuance the authors' framework. Specifically, Sijilmassi et al. argue that individuals join coalitions not only because of the top-down efforts of elites, but because they consciously perceive gains to coalitional membership. Sijilmassi et al. point to the provision of public goods and the creation of just institutions as potential benefits of subscribers of such myth-based recruitment projects. While modern Hindu nationalism upholds a caste hierarchy with clear material benefits for the already privileged individuals belonging to upper caste and class backgrounds (Mannathukkaren, 2021), it is less clear if lower caste, lower class individuals who choose this ideology are expecting any such material benefits. Indeed, rather to the contrary, BJP-led governments have overseen significant *reductions* in the safety nets for the majority, including the slashing of funding for the world's largest work-for-welfare programme and repeated attempts to limit subsidies to farmers (Jaffrelot, 2019). Inequality and unemployment have increased in the two terms of BJP rule (Chowdhury, 2023). Thus, it is difficult to make the argument that individuals of lower caste and class backgrounds are choosing Hindu nationalist politics exclusively because of genuine economic benefits.

Instead, the benefits that lower caste individuals might hope to secure may lie in a perceived improvement in social standing compared to a mythical "other," or a sense of co-belonging with more prestigious social groups that are nominally related to one's own social group. Thus, applying the logic that Sijilmassi et al. articulate to contemporary Indian politics, we argue that belongingness benefits are just as important to consider as the economic and material benefits that Sijilmassi et al. highlight.

In this regard, understanding the psychological mechanisms driving the use of myths in Indian politics is of particular interest and importance. We propose that the success of these myths lies in drawing upon the evolved human capacity for prestige-based status. Humans possess an apparently unique form of social status that is based on respect, admiration, and freely conferred deference from others in the social group (in contrast to dominance, a form of social status that entails status derived from threatening and coercing others) (Henrich & Gil-White, 2001). In creating coalitions, high-ranking individuals possess a variety of strategies and mechanisms to recruit and control lower-ranking individuals in the service of competing with other groups (Sarkar & Wrangham, 2023). These can reasonably be interpreted as entailing both dominance-oriented and prestige-oriented approaches. For instance, a dominance-oriented approach involves punishing lower-ranking individuals who refuse to participate in intergroup conflict or whose participation is deemed insufficient (Mathew & Boyd, 2011). However, as Sijilmassi et al. point out, myths also serve as a useful recruitment strategy (and perhaps one that foments less conflict), and this use of myths appears to be a rather more prestige-oriented coalition-building strategy. A particular feature of prestige-based social status is the behavioural imitation of prestigious models. Part of the reason that the myths promulgated in Hindutva politics have contributed to the BJP's success is that they invite (if only in an illusory capacity) low-ranking members of society to participate in high-prestige practices. "Sanskritization" offers an example of how prestige-associated behavioural imitation operates in Indian politics. Sanskritization refers to a process in which lower caste individuals emulate and imitate higher caste practices in an attempt to improve their social standing (Srinivas, 1956). While the process predates the BJP and the Sangh Parivar, their political ascendancy has dramatically raised the stakes of Sanskritization in modern India. Dalits (formerly referred to as "untouchables") and other lower caste individuals who join the BJP and affiliate organizations often aspire to such status gains (Teltumbde, 2005/2020). Shared mythology, based on the dual myths articulated by the Sangh Parivar, could facilitate such perceptions.

These processes can be appreciated in interviews conducted with Dalits. For example, a Dalit man and former member of the RSS explained how recruits were reminded that they were all members of the ancient race of Aryans; that they and their blood were "the best" (Kumar, 2020). By participating in Hindutva politics, they could reclaim for themselves as well as for the nation of Hindus a lost glory. In other words, these individuals and groups can rise in prestige via affiliation with the mythology of a more prestigious social group. The participation of lower caste individuals in Hindu religious festivities – the choice and celebrations of which is in line with select upper caste Hindu traditions – affords a sense of cultural belonging (Kanungo, 2007; Teltumbde, 2005/2020). Notably, these social benefits occur in the absence of appreciable material benefits. Through Sanskritization, the BJP and its affiliate organizations can actualize the myth of Hindu unity that is central to their cultural narrative. Those groups that are unable or unwilling to be assimilated because of their cultural distance from Hindutva's core, most notably Muslims, are identified as "others." These groups consequently deserve the ire of the now significantly expanded "Hindu" fold. Thus, myths play an important role in contemporary Indian politics, but the coalitions they enable are based just as much, if not more, on symbolic benefits rooted in perceived belongingness as in material improvements.

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Historical myths are believed because audiences are socially motivated

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Abstract

Do people believe in historical myths because they are manipulated by coalitional recruiters, or because it is in their interests to do so? The target article gives somewhat conflicting explanations. We propose that the audiences of historical myths are socially rather than epistemically motivated – they believe and propagate historical myths as a way of signaling their coalitional commitments.

Sijilmassi et al. propose that historical myths – narratives of shared ancestral roots and a long history of repeated interactions – are culturally evolved technologies designed to build and maintain large-scale coalitions. However, throughout the target article, Sijilmassi et al. present seemingly conflicting explanations of the psychology of the audiences of historical myths.

At times, the authors argue that audiences are deceived by historical myths. For example, they write: "coalitional recruiters must craft historical myths that are sufficiently credible to bypass the epistemic vigilance of their audience" and explain that the blend of truths and falsehoods in historical myths "reflects the tension between the strategic intentions of producers and the epistemic vigilance of receivers" (target article, sect. 4.3.).

Elsewhere, the authors argue that audiences believe and propagate historical myths because it is in their interests to do so. For example, in section 6.1, they write: "Top-down nation-building endeavors have indeed proven to be highly successful in many countries, but this success might be better explained by individuals' perception that they actually stand to gain from committing to the nation than by passive indoctrination."

We propose that this apparent conflict in the target article can be resolved by recognizing that individuals who join large-scale coalitions are socially rather than epistemically motivated. Although historical myths likely serve multiple social functions, one such function might be to signal coalitional commitment (Barlev & Neuberg, 2024). As such, if individuals decide that it is in their interests to join a large-scale coalition and signal their affiliation and commitment to this coalition, they may swing open the gates of their epistemic defenses to welcome historical myths. As the target article stresses, humans are a uniquely social and interdependent species. However, social groups are vulnerable to being undermined by free riders – individuals who reap the benefits of affiliating with the group without incurring the costs of contributing to it. We have therefore evolved a psychology to identify free riders. This psychology is sensitive to intentions, differentiating free riders from individuals who are merely unlucky or who have made innocent mistakes (e.g., Delton, Cosmides, Guemo, Robertson, & Tooby, 2012). In line with this, in group tasks, children as young as seven choose to reward those with "authentic" or "sincere" motives and penalize those with motives that can be viewed as self-serving (Shao, Huang, Zhao, & Heyman, 2023).

We have also evolved to signal our group commitment. We do this in various ways, such as through the slang we use, the clothes we wear, and the ways in which we decorate and modify our bodies. A signal serves this function effectively if the potential costs of broadcasting it are higher for uncommitted group members than for committed ones (Higham, 2014; Kurzban & Christner, 2011). Historical myths meet this requirement in at least two ways. First, expressing belief in a historical myth identifies an individual as allied with the coalition, and therefore, not allied with rival coalitions. This both invites potential costs and makes it more difficult for that individual to join a different coalition. Second, compared to more well-documented signals of coalitional commitment (e.g., tattoos), historical myths often feature improbable or even impossible embellishments. When propagating historical myths with such features, individuals might appear unintelligent or even delusional to observers. The more outlandish the myth propagated, the higher the reputational cost with outgroup members, the harder it is for the individual to join a new group, and therefore, the more effective the myth is as a signal of group commitment.

Studies on imitation and conformity are compatible with this proposal. For instance, children readily copy arbitrary gestures by group members and follow new group norms (Tomasello, 2016; Watson-Jones & Legare, 2016). Although such findings are often interpreted from a social learning perspective, they align with our proposal here: Following arbitrary norms or behaviors specific to a group can be a way to signal a desire to affiliate with that group. Indeed, even children as young as five

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understand that strong conformity (i.e., publicly endorsing a majority opinion, even if privately disagreeing with it) can be a way for an individual to affiliate with the majority (Cordonier, Nettles, & Rochat, 2018).

We are not suggesting that coalitional recruiters never manipulate their audiences. However, when individuals are persuaded, it is more so in the cost–benefit analysis of joining the coalition, rather than in the veracity of the historical myth. That is, they might be persuaded that it is in their interests to join the coalition when it may not be in reality; this may or may not also involve persuading them – or, when this is based in reality, reminding them – that there exists a long history of repeated interactions among members of the coalition.

In summary, people are not always motivated to represent the world veridically; rather, they are often motivated to hold and propagate beliefs that serve social functions for them. We have proposed that one function historical myths serve is to signal group commitment. As such, people believe and propagate historical myths not because they have been persuaded by coalitional recruiters, but because they decided that it is in their interests to do so.

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Why some coalitions benefit from historical myths more than others

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Abstract

Behavioural ecologies in themselves can create variation in fitness interdependencies among individuals, and hence modulate the functionality of invoking historical myths. We develop this possibility for the case where coalitions form to attack and exploit enemies, or to defend and protect against hostile out-groups. We propose that invoking historical myths are functional and observed especially when groups aggressively expand.

Sijilmassi et al. present compelling evidence for the possibility that historical myths draw attention to cues of positive fitness interdependence which, in turn, enables humans to engage in large-scale collective action and to prevail in intergroup conflicts. Their analysis not only explains why humans – across time and space – so often celebrate a long-gone past, but also generates new questions and hypotheses about coalition formation, the historical roots of group solidarity, and the dynamics of intergroup conflict. Here we develop one hypothesis by considering that behavioural ecologies in themselves can create variation in fitness interdependencies and hence modulate the functionality of invoking historical myths.

Some coalitions form to protect against environmental threats and to survive attacks from hostile neighbours (viz. defence; De Dreu & Gross, 2019; Rusch, 2014). In such behavioural ecologies, failure to avert threat results in significant losses for all individuals involved, including economic losses, physical injury, and, in extremis, death. Individuals share a "common fate" – they have positive fitness interdependence – and this not only enhances in-group solidarity (Boyer, Firat, & van Leeuwen, 2015) but also promotes coordination and cooperation (Aktipis et al., 2018; Balliet, Tybur, & Van Lange, 2017; De Dreu, Gross, & Romano, 2024). Conversely, some coalitions form to subordinate and exploit neighbours, that is for raiding and offensive warfare (*viz.* attack; De Dreu & Gross, 2019; Rusch, 2014). All else equal, coalitions for attack exhibit lower levels of interdependence than coalitions for defence because during attacks also those individuals who do not (fully) engage in participation, and "lay low" to avoid losses and injury, may still benefit from victory and share in the spoils of war. Moreover, when attacks and collective attempts at subordination and exploitation fail, those who laid low suffer less from the waste of conflict than those who contributed.

Recent intergroup contest experiments (Fig. 1a) revealed three core consequences of this stronger free-rider problem faced by coalitions for attack rather than defence. First, attacker groups display lower levels of in-group identification and solidarity (De Dreu & Gross, 2019). Second, individuals in attacker groups invest fewer personal resources in conflict than defenders (Fig. 1b). Third, attackers coordinate their conflict contributions less well than defenders – within-group variance in contributions to conflict is larger (Fig. 1c). As a result of these three behavioural patterns, attacker groups disproportionally often fail to defeat their enemies (De Dreu et al., 2016).

Individual members, and their leaders, seem aware of these asymmetries. To make offensive warfare and raids more likely to succeed, coalitions form around friendships and invest in building interpersonal bonds among its members (Glowacki et al., 2016; Macfarlan, Walker, Flinn, & Chagnon, 2014), for example, by using cultural rituals such as war dances (Fischer,

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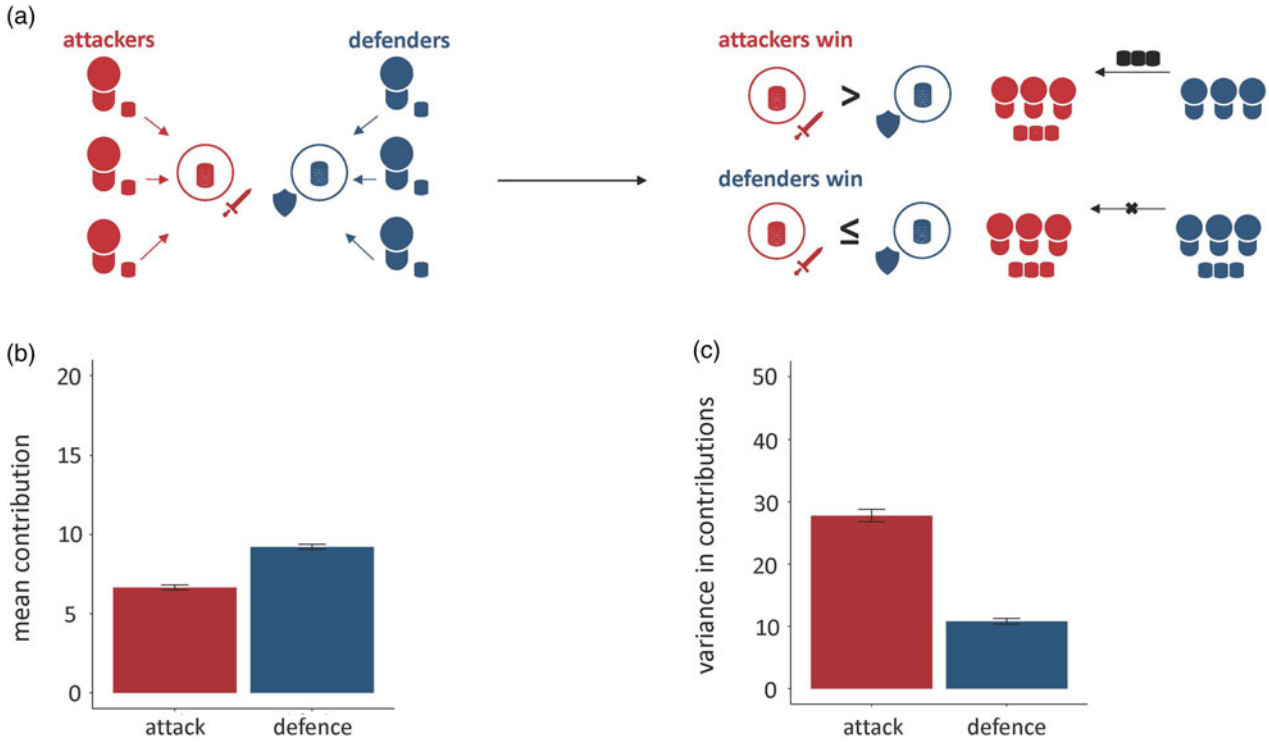


Figure 1 (Snijder and De Dreu). The intergroup attacker–defender contest. (a) Six participants in two groups of three are assigned the role of attackers (red) or defenders (blue). In each round, participants decide how many units to contribute to attack (the "sword" symbolizes the total number of units contributed by the attackers to the conflict pool) or defence (the "shield" symbolizes the total number of units contributed by the defenders). Units contributed to conflict are non-recoverable, yet if combined contributions to attack exceed contributions to defence, attackers win and receive all non-contributed units from the defenders (i.e., defenders earn nothing); otherwise, individuals on both sides earn whatever they did not contribute to conflict. (b) Weighted average of contributions to out-group attack and in-group defence (based on De Dreu et al., 2016, 2022; Gross, De Dreu, & Reddmann, 2022; Snijder, Gross, Stallen, & De Dreu, 2024; Yang, Zhang, Ni, De Dreu, & Ma, 2020). (c) Weighted average of within-group variance in contributions as a measure of within-group coordination failures (based on De Dreu et al., 2016, 2022; Gross et al., 2022; Snijder et al., 2024; Yang et al., 2020). Error bars indicate the standard error of the mean (total $N = 245$ attacker and 245 defender groups of three individuals each).

Callander, Reddish, & Bulbulia, 2013; Whitehouse & Lanman, 2014). From Sijilmassi et al., it follows that precisely here, for coalitional attacks, invoking historical myths may be pivotal both to recruit members and to motivate recruits to fight rather than free-ride. Evidence for these possibilities would fit anecdotal evidence. For example, during the expansion of the Roman Empire, soldiers were often motivated by tales of past conquests and legendary leaders like Julius Caesar (Taylor, 2003), and political myths have also been used to legitimize attacks like the "war on terror" (Esch, 2010). Crucially, however, it also follows that historical myths are less needed, and hence less likely to be invoked, for coalitions for defence and protection where the inherent positive fitness interdependencies among affected individuals already motivate cooperation and coordinated collective action.

Sijilmassi et al.'s treatise alongside theory and research on the form and function of conflict suggests that (i) historical myths are functional for coalitional warfare that aims to subordinate and exploit more than for coalitional defence and protection; and therefore (ii) historical myths are invoked more readily – and should be seen more often – in coalitions for unprovoked aggression rather than more reactive defence. If true, whenever community leaders or high-raking politicians invoke historical myths, followers and outsiders should be "on guard" not to protect against impending hostilities but rather to avoid being recruited for otherwise unprovoked conflicts that may serve leaders more than citizens.

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Historical myths promote cooperation through affective states

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Abstract

Although we agree that historical myths function to increase cooperation in the groups that share them, we propose that the mechanisms at work may include affective states. We suggest that sharing historical myths can create a felt sense of intimacy, similarity, and security among group members, which increases trust and motivates cooperation, even without particular beliefs about population structure.

Though historical myths may foster cooperation because they provide cues of fitness interdependence through identity fusion, we suggest that, when effective in promoting cooperation, they also create affective feelings of security, trust, and intimacy. Sijilmassi et al. posit that historical myths increase cooperation because they create a "mental representation that cooperation within a given coalition constitutes a mutually beneficial cooperative arrangement" (sect. 3.2, para. 7). In this commentary, we discuss why the authors' explanation may need to be supplemented with an account of the affective states of the recipients of the myths.

To begin, note that not all perceptions of mutual benefits "manifests as a feeling of moral duty." Consider the case of individuals working together on dangerous technologies, who are cooperating in a scientific coalition but who still have doubts about the morality of their project. We agree that a "sense of should" (Theriault, Young, & Feldman Barrett, 2021) will be an important part of the power of myths, and this requirement suggests to us that more attention can be given to the affective power of myths.

In addition, consider that even in population structures supported by shared myths, cooperators face a challenge: They must be sure that their partner is motivated enough to gain benefits from cooperating; and honest enough to share the benefits fairly, without deception, exploitation, or flawed self-perception. Given this challenge of selecting good cooperators from a pool of individuals with their own motivations, personality traits, energy levels, and capabilities, we need to look beyond population structure to person-level cues of honesty, ability, and integrity.

For an example, consider this case: I am journeying in unfamiliar territory and spot an opportunity to spear a bison if I can recruit a member of a nearby camp to help me. I incentivize assistance by offering a share in the spoils. Simulating one-shot cooperative incentives like this, laboratory games have shown that people use systematic heuristics to decide how cooperative to be with unfamiliar individuals: Physical markers of strength, attractiveness, health, and social status all strongly predict the extent to which individuals are chosen for cooperative partnerships (Eisenbruch, Grillot, Maestripieri, & Roney, 2016). Given our sensitivity to these physical characteristics when choosing cooperative partners, we should expect historical narratives which portray fellow group members in these lights to incentivize cooperation. This can explain the tendency of historical myths to showcase the physical traits, personal attributes, and life legacies of valued and respected legendary group members (living and nonliving), portraying these legends as intricately connected to the group's kinship and social networks (Wiessner, 2014). Reporting on the stories told by firelight in small-scale hunter gatherer communities, Wiessner notes that the ritual of retelling stories by firelight engenders "more accurate understanding of the thoughts and emotions of others, particularly those not immediately present" which generates "the regularity of behaviour so essential for cooperation" (p. 14027).

While we thus agree that myths can increase cooperation among group members by inculcating beliefs about the group, we suggest that an affective feeling of security can have these effects on cooperation without the need for any *particular* belief. Consider that the successful coalitions seen in nonhuman animals function without myths, and arguably without any cognitive representations of what makes the group a group. Positive affect toward others as fellow travelers, or at least high levels of toleration, permits the cooperative arrangement.

Returning to the human case, a sense of security versus discomfort with another person explains willingness or reluctance to invest resources and time in partnerships, without the need to form an explicit representation of the features that constitute a good cooperative arrangement. Sharing a historical myth about one's group can provide a feeling of similarity to our partners, who share a part of our identity that we feel strongly about (e.g., a Canadian, a Sikh, a socialist, etc.). This can motivate us to help them and trust them, by creating a sense of intimacy which may otherwise be absent, rather than by creating a belief about *how* we become a community. The affective account can explain why historical myths would be more prevalent in larger populations, without which, intimacy among average members is lower, members tend to be less like each other, and individuals' goals are more varied. Also, in places where people have more coalitional opportunities, the incentives are higher to display these desirable traits and foster cooperative relationships.

Sharing myths about a group's defining characteristics, historical developments, and legendary members also enable us to set observable standards on what it means to do things "the way I

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would," or "as a self-respecting Canadian would" given the values showcased in the myths, and the behaviors proscribed and promoted. By marking out contexts in which cooperation is expected from all members of a group, for example, religious activities like rituals, holiday celebrations, and offerings to deities; seasonal agricultural activities; and environmental calamities, the myths have the additional feature of making free riders or noncooperators easily identifiable – by failing to cooperate in the contexts featured in myths as defining of the group, the sense of intimacy and similarity is missing. This causes feelings of discomfort which have constraining effects on altruism, cooperation, and trust. This feature of exposing untrustworthy or incapable individuals explains the prevalence of historical myths when coalitions require more costly investments – in these cases it is more important to detect and avoid disingenuous or unreliable cooperative partners, with whom these investments are unlikely to pay off.

In summary, since coalescing in groups that have stood the test of time provided such significant fitness advantages for our ancestors, we predict that humans evolved an emotional affinity for cues of longstanding groups, and displaying these cues in our interpersonal interactions cause us to feel more comfortable and safer with each other. These feelings can independently serve as a motivation to trust each other, and to invest more of our time, our resources, and our energy in cooperative ventures.

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Limited evidence that fitness interdependence produces historical origin myths

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Abstract

This commentary points out some theoretical lacuna in the argument and then evaluates, in a preliminary way, its main comparative empirical hypotheses. It finds very limited support for the observable implications of the evolutionary theory. By contrast, the historical remoteness of foundational myths is closely associated with how long a society has been ruled by a centralized state, pointing at the important role of political history.

This sweeping and intriguing article seeks to explain why so many human groups developed foundational myths that proclaim their origins in the deep historical past. The main argument is that such historical tales are developed by political entrepreneurs who seek to profit from the human tendency, evolved through millennia of evolutionary pressures, to equate shared history with shared interest in each other's survival (or "fitness interdependence"). Mythical narratives of shared historical origins should be more prevalent, the authors argue, (1) in larger groups – because there are fewer opportunities to observe individual fitness and thus which individuals would be advantageous to form a coalition with, (2) in groups that offer a more diverse range of possible coalition partners and thus more competition among political entrepreneurs, (3) in groups that are exposed to more intense survival pressures especially through warfare, (4) in groups that are not internally differentiated into dominant and marginalized segments, and (5) in groups that offer distinctive markers of difference that allow an easy identification of coalition partners.

There are some unresolved issues in this thought-provoking argument. The first is that it runs into the same problems that plague the theory of elite manipulation, swiftly criticized by the authors: Why would individuals believe in promises of group solidarity and the evolutionary advantages that it could potentially offer? In other words, why do individuals follow the siren songs of entrepreneurs who invent historical myths, if there is no causal link to objective and effective fitness-interdependence? Nowhere in the argument do individuals evaluate the objective fitness advantages of varying historical myths and the associated coalitions. We thus do not know why they embrace such myths at all and if they do, which ones they chose.

Second and relatedly, there are plenty of examples of historical myths that are not tales of successful co-operation and survival, but tales of victimhood, defeat, and injustice, as witnessed by Zionism or Polish nationalism. If the coalition offered by these tales has not proven, historically, to increase the survival chances of its adherents, why would individuals continue to embrace them and the corresponding group identities? Third, these examples perhaps point to the more general limits of evolutionary arguments in explaining the varieties of human experiences across the world. While the article zooms in on group size as a crucial explanatory factor for this variety, distinguishing between face-to-face societies (which don't need historical myths) and all other societies, much important and consequential variation in historical origin stories remains unexplored – between ethnic and civic versions, between imperial stories of superior civilizational origins and the familiar nationalist tales of the modern age, between genealogical charters and non-genealogical ideas of historical continuity, and so forth.

Fourth and perhaps most importantly, the article does not offer any empirical evidence for the observable implications of the argument. In what follows, I will put their five hypotheses, summarized above, to a preliminary test using available data. How do we operationalize the existence of historical myths? Since these are ubiquitous, as the authors note, in societies organized into larger than face-to-face groups, a binary coding would not make much sense. I thus interpret their argument as follows:

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In societies that are especially prone to produce historical myths, the origin stories should be further removed from the present. Kaufmann (2015) has coded what he described as the "foundation years," according to historical legends, of the majority ethnic group of each contemporary country. The data were generated with the help of experts in the ethnic and national histories of peoples from around the world. Despite its many limitations, let us use these data. The earliest imagined foundation year is 750 years BC (Greece), the last 1975 (Papua New Guinea). The average is the year 1419.

The size of the population in 2005, which I will use to test H1 above, comes from Wimmer, Cederman, and Min (2009). I use data on the linguistic diversity of countries in the 1960s, as recorded by Soviet linguistics, to evaluate the effects of the range of coalitional opportunities (as according to H2, diversity offers opportunities for assimilation, for fusion and fission of related languages, etc.; other fractionalization indices produce similar results). Data on the number of wars fought between 1816 and 2005 come from Wimmer and Min (2006) and will be used to test H3. The degree to which a population is divided into dominant and marginalized segments is measured with the average population share of the ethnic groups not represented in national-level government between 1945 (or the year of independence) and 2005 (for testing H4; data again from Wimmer et al., 2009). Finally, to test H5 I use again data from Kaufmann to code in a binary way if a self-determination movement used ethnic diacritic (such as language or religion) to delineate the nation (as was the case in Germany or Israel, but not the United States or France).

I add one important control variable without which the analysis would be unconvincing for any historically oriented social scientist: The degree and duration of past statehood in a society. Obviously and as mentioned by the authors, state elites are often those who craft narratives of historical origin and continuity. How far back in history there was a state may thus very well influence how far back historical narratives locate national origins. I use Bockstette, Chanda, and Putterman's (2002) well-known state-antiquity index, which combines state age with degrees territorial control and levels of centralization into a single index.

Results of a linear regression model are shown in Table 1.

Table 1. Linear regression on the assumed origin year of national majorities

Population (averaged from Fearon & Laitin; WDI; Penn World Tables)	−0.0000155 (0.000393)
Linguistic fractionalization (Soviet Atlas; from Fearon & Laitin)	57.64 (182.2)
Cumulative No of wars fought since 1816	−24.37 (14.72)
Mean proportion of excluded population between 1945 and 2005	65.31 (261.7)
Ethnic basis for national self-determination (Kaufmann)	−291.7** (118.3)
Cumulative index of state centralization since 1000 BC (5% discounted; Puterman)	−935.0*** (196.5)
Observations	135
R^2	0.3035

Standard errors in parentheses; *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

The results provide no evidence for four of the five hypotheses. Only ethnic nationalism tends to project history back further, for about 290 years. This may very well be an endogenous relationship, however, as ethnic nationalists not only search for deep historical origins, but also look more systematically than civic nationalists for diacritic that distinguishes themselves from their neighbors. The antiquity of statehood, however, is a powerful predictor of how far back foundational histories go: One standard deviation increase in the index is associated with a 226 years older historical origin. It is therefore wise not to dismiss the specifics of political history in search for universal, evolutionary explanations.

In conclusion, I don't find much support for the hypothesized mechanisms producing a need for deep historical origin stories. And I miss a conclusive argument about why these myths should take root in the population at large, thus leaving one of the main puzzles in the study of nationalism unresolved (for my own, modernist answer, see Wimmer 2018).

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The social cognitive evolution of myths: Collective narratives of shared pasts as markers for coalitions' communicative and cooperative prowess

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Abstract

To understand why humans put much effort into celebrating cultural myths, it is crucial to approach this phenomenon as part of humans' broader social cognitive evolution. Specifically, humans' unique capacity to bond with others through shared/collective representations of shared experiences has likely caused individuals to use myths to assess not only coalitions' fitness interdependence, but also their cooperative prowess.

The proposal of Sijilmassi et al. is an intriguing one, namely that collective myths are a cultural technology aimed at recruiting coalition partners through super-stimuli referencing collective shared experiences. Yet, the role of the psychology underlying humans' (perhaps unique) capacity to bond and create coalitions through shared experiences is remarkably absent from the authors' model, despite having important implications for the use of myths to establish large-scale social cohesiveness.

Humans' reliance on cooperation for their survival has caused them to evolve a set of social cognitive skills facilitating unique forms of communication, collaboration, and cultural learning (Tomasello, 2019). One important social cognitive skill that facilitates these features of human cooperation is the capacity to create shared representations of perception, intentions, emotions, and beliefs with others (Shteynberg et al., 2023), facilitating joint agency as well as the common ground necessary for abstract linguistic communication (Bratman, 1993; Clark & Brennan, 1991; Clark, Schreuder, & Buttrick, 1983; Echterhoff, Higgins, & Levine, 2009; Shteynberg et al., 2023; Tomasello & Carpenter, 2007; Tomasello & Rakoczy, 2003). In addition, once humans started to live in larger social groups in which large-scale cooperation could no longer be regulated through interpersonal social relationships alone, humans developed the capacity to extend shared representations beyond their interpersonal social network to their cultural group as a whole (Kern & Moll, 2017; Tomasello, Melis, Tennie, Wyman, & Herrmann, 2012; Tomasello & Rakoczy, 2003). These collective mental representations then paved the way for the emergence of societal norms and institutions (Tomasello, 2016; Tomasello & Vaish, 2013).

Recently, it has been argued that this capacity to create shared representations during shared experiences also plays a crucial role in humans' unique social bonding activities, such as conversation, games, art, and cultural rituals (Wolf & Tomasello, 2023). Research has shown that both adults (Dunbar et al., 2016; Rennung & Göritz, 2015; Wolf, Launay, & Dunbar, 2015) and children (Wolf & Tomasello, 2020b) feel closer to others after they have experienced something together. Although this phenomenon has also been found in great apes to some degree (Wolf & Tomasello, 2019), humans seem to share experiences particularly effectively by creating mutual awareness of their experiences being shared in a way other animals do not (Wolf & Tomasello, 2020a).

In line with Sijilmassi et al., group myths seem to function in a similar way, albeit through collective rather than interpersonal shared representations. That is, to facilitate social cohesiveness in groups that were too large to maintain social cohesion through interpersonal social activities, humans' social cognitive evolution enabled them to bond through collective, institutionalized representations of a group's past shared experiences. In this light, the group continuity aspect Sijilmassi et al. propose can be construed as a facet of a broader collective representational psychology in which not only myths, but all collective representations including institutions and norms are often experienced as transgenerational and continuous.

Previous theoretical work on these shared and collective representations has also provided explanations as to why such representations cause social bonding (Wolf & Tomasello, 2023). Crucially, these explanations would expand the psychological model of Sijilmassi et al. in one important way: Although the authors state that humans use myths to track cues of a group's duration, frequency, and intensity of cooperative exchanges, it seems likely that myths also contain cues relating to the actual communicative and cooperative prowess of (members of) that coalition, as well as the degree to which communication and cooperation is valued within a coalition's culture.

It has been argued that shared (and collective) representations cause social bonding not only because it allows individuals to assess potential partners' willingness to cooperate (with shared social activities as costly signals for cooperative intentions), but that shared social activities also provide a testing ground to evaluate potential partners' social cognitive capabilities relevant to cooperation and communication (Wolf & Tomasello, 2023). As the skills necessary for creating shared representations in social bonding activities are identical to those facilitating collaboration and effective communication in joint problem solving, it stands to reason that those who do so more effectively during social bonding activities will also be more effective collaborators in other situations requiring collaboration. This, in turn, makes these individuals more desirable cooperative partners.

Importantly, the same rationale can be applied to myths as collective representations within human coalitions. It seems plausible that humans evaluate coalitions' sharing of myths amongst themselves and toward new recruits to infer how desirable that coalition is in terms of their social communicative and collaborative prowess. For example, if there are narrative inconsistencies between coalition members, potential new recruits might infer that communication within that coalition is less effective, which might also cause problems during collaborative activities. Conversely, high consistency across coalition members in the telling of a myth rich in details (i.e., more sources of potential narrative variability) can be interpreted as a sign of strong collective communication within a group, making membership of that coalition more desirable. This applies especially to myths pertaining to events in the distant past, as successful sharing of those myths signals that communicative and cooperative capacities have been valued by this coalition for multiple generations, suggesting that this alliance has been culturally nurturing communication and cooperation throughout this time. This implies that the most successful myths are myths that are rich in content while being simultaneously easily and consistently reproducible by coalition members, for example, by tapping into salient and culturally relevant episodic events, such as conflicts with other coalitions or individual achievements of individuals that benefitted the coalition.

In other words, psychological models explaining why collective myths are particularly effective at creating large-scale cohesion (and why some types of myths are selected for while others are not) should not solely focus on individuals' capacity to infer the degree of fitness interdependence of a coalition based on how often and intensely they collaborate, but should also incorporate a psychological mechanism for recognizing a coalition's cooperative and communicative prowess based on how detailed these myths are, and how consistently they are communicated, and have been over time.

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Historical myths define group boundaries: A mathematical sketch and evidence from Ukraine

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Abstract

The authors' proposal for the evolutionary origins of historical myths does not hold up to scrutiny, as illustrated by a simple mathematical model. Group-level explanations, such as defining the conditions for in-group membership, are dismissed by the authors but are far more plausible, as illustrated by the ongoing war in Ukraine.

The target article proposes that historical myths are cultural technologies for coalitional recruitment that exploit cognitive mechanisms for measuring fitness independence. The main challenge for this proposal, as we see it, is that the fitness interdependence between individuals in large groups is vanishingly small. Therefore, any cognitive mechanisms that explicitly evolved for identifying fitness interdependence worth their salt are unlikely to be fooled by historical myths to the contrary.

Imagine a world where there is a large-ish population, say $N = 100{,}001$ individuals. Each individual starts with some amount of resources, G, and can contribute some amount, $b < G$, to a collective enterprise. Any amount that is contributed (in a typical public-goods-like fashion) is doubled and the results are shared with everyone else in the group. Therefore, the population generates its highest total resources, $N(G + b)$, if everyone contributes, and its lowest total resources, NG, if no one contributes.

For the individual, however, it always pays more to not contribute. Generally, the payoff to an individual who contributes is $G + 2pb - b$, where p is the fraction of other individuals who contribute. The payoff to a non-contributor is $G + 2pb$. In other words, non-contributors always do better than contributors, no matter how much the latter contribute, because the non-contributors get all the benefits of the collective enterprise but do not pay the costs. This is a standard linear public goods game. Note that there is very little fitness interdependence between two typical members of this group. For this collective enterprise, it is at most $2b/N$.

Now imagine that some people in the population are conditional contributors who only contribute if they hear historical myths that their population is an ancient group with a long history. Other people either lack this cognitive machinery or have a more refined cognitive machinery that is not easily fooled by historical myths. When hearing historical myths, the former would contribute to the collective enterprise and the latter would not. Even assuming that some actors are willing to pay the cost of creating and perpetuating cultural myths, the individuals who are not fooled by these myths will tend to do better because they receive the benefits of cooperation without paying the cost. This suggests that malfunctioning cognitive mechanisms for fitness interdependence is an unlikely explanation for the content of historical myths because such cognitive mechanisms would be quickly weeded out.

The authors assert that their explanation does not require cultural group selection and that individual cognitive mechanisms suffice to explain historical myths. However, population-level explanations like cultural group selection can explain *why* individual-level cognitive mechanisms are or are not likely to evolve. In particular, a cultural group selection perspective suggests a functional explanation of historical myths as a group-level trait (Smaldino, 2014) for indicating the scale of cultural variation and, therefore, the scale of cooperation (Henrich & Muthukrishna, 2021). Cultural group selection models suggest that the scale of cooperative interaction is likely to be at the scale of cultural variation, which can be measured by a cultural fixation index (Bell, Richerson, & McElreath, 2009; Handley & Mathew, 2020; Henrich, 2004; Richerson et al., 2016), which

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quantifies how much total cultural variation can be explained by variation between groups. This may be especially relevant in understanding intergroup conflict (Zefferman & Mathew, 2015).

We suspect that the function of many historical myths is to clarify the scale of existing cultural variation. That is, they help distinguish cultural in-group from cultural out-group. This hypothesis predicts that the scale of historical myths, especially successful ones, will tend to correspond to the scale of cultural boundaries – not to the scale of fitness interdependence. This would especially be true for large groups, as fitness interdependence decreases exponentially with group size and is therefore very small in groups the size of bands, tribes, or nations (Henrich, 2004). Cultural similarity within groups has no such bounds on scale.

Take the authors' example of the ongoing conflict in Ukraine and the historical myths spread by Putin and his allies about the long historical association between Ukraine and Russia – that they are all "one people." According to the authors, the function of this rhetoric was to encourage the Ukrainian people to join with Russia by activating their cognitive mechanisms for detecting their fitness interdependence with the Russian people. If so, it failed spectacularly. However, we suggest that the function of these myths is to define cultural boundaries for Putin's domestic audience. Putin not only invoked a long history of Ukrainians and Russians as one people but also invoked cultural similarities with some (especially Russian-speaking) people in Ukraine against those who he identifies as "Nazis."

To Westerners, the idea that Ukraine – with a Jewish president whose family members were killed in the holocaust – is led by Nazis is ludicrous. But in Putin's narrative, "Nazism" is a stand-in term for Western culture and influence. Most of Putin's speech marking the beginning of the 2022 invasion of Ukraine focused not on the unity of the Russian and Ukrainian people, but on the dangers to Russia due to Western expansion, comparing this expansion to the 1941 invasion of Russia by Nazi Germany – the last time Russia was invaded from the West (Atlantic Council, 2023). The initial goal of the Russian operation was rapid neutralization of Ukrainian leadership, indicating his promise to "de-nazify" Ukraine was aimed at Ukraine's elected political leaders. When the Russian forces met with stiff resistance, however, the narrative quickly shifted to where Russian state media defined "Nazism" in Ukraine as applying to a "considerable number of the population (very likely most of it)," and claimed that Ukrainians "disguise Nazism as the aspiration to 'independence' and the 'European' (Western, pro-American) path," and that "the collective West is in itself the architect, source, and sponsor of Ukrainian Nazism" (Sergeytsev, 2022; Snyder, 2022; Stanley, 2022). Instead of activating Ukrainian cognitive machinery to see fitness interdependence with Russia, Putin's historical myths seem to be about defining a Russian "us" in opposition to a Ukrainian or Western "them."

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Authors' Response

Coalitional psychology and the evolution of nationalistic cultures

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Abstract

The commentaries addressed various aspects of our account of historical myths. We respond by clarifying the evolutionary theory of coalitional psychology that underlies our claims (R1). This addresses concerns about the role of fitness interdependence in large groups (R2), cultural transmission processes (R3), alternative routes to nation-building (R4) and the role of proximal mechanisms (R5). Finally, we evaluate alternative theories (R6) and discuss directions for future research (R7).

We sincerely thank all commentators for their thoughtful engagement with our article and for sharing their valuable insights. We are pleased that our work has garnered attention from researchers across a broad spectrum of disciplines. Most major traditions in

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cognitive and psychological sciences – and almost all of the ones we explicitly discussed in the target article – are represented in the commentaries, including social psychology (e.g., **Bilewicz & Bilewicz**; **Kardos**), evolutionary psychology (e.g., **Pietraszewski & Moncrieff**), cultural evolution (e.g., **Zefferman & Smaldino**), philosophy of mind (e.g., **Wildes & Andrews**; **Blancke**), and psychopathology (e.g., **Fonagy & Campbell**). We are especially grateful to commentators from political science and history (e.g., **Sarkar & Sarkar**; **Friedman**; **Wimmer**) for allowing us to engage in productive scientific discussions beyond traditional disciplinary divides. Overall, we rejoice that our article had the intended effect: to spark a renewed multidisciplinary interest in the topic of historical myths.

The commentaries were diverse and addressed many aspects of the target article. To respond comprehensively, we first restate the theory of coalitional choice, which forms the theoretical basis of our account of historical myths (R1). We then address concerns regarding the theoretical impossibility of fitness interdependence at the national scale and its implications for our theory of cultural transmission (R2 and R3). Next, we acknowledge the point raised by several commentators that historical myths are not the only tool for nation-building (R4). We agree: group affiliation is shaped by a flexible coalitional choice psychology and can arise from any input – symbolic or material – that signals productive social interactions. Historical myths are just one recurrent example of such inputs. We also clarify the distinction between ultimate and proximate explanations (R5). Many commentaries focused on proximal factors influencing the appeal of historical myths. We argue that our ultimate-level theory accommodates several of these proximal pathways. Lastly, we evaluate alternative ultimate explanations proposed in the commentaries (R6) and explore potential directions for future research (R7).

R1. Nations as the products of coalitional choice psychology

National categories often feel self-evident to individuals who live in nation-states. For many, it seems obvious that categories such as "France," "Spain," or "Ukraine" delimitate something meaningful about the world – specifically, something that ought to form the basis of political sovereignty and citizenship rights and duties (Anderson, 1991). Yet, the perceived naturalness of national categories is a typical case of *instinct blindness*: some social phenomena feel so natural to us that we discard the fact that they actually proceed from highly complex computations (Cosmides & Tooby, 1994). As noted by **Pietraszewski and Moncrieff**, the task of psychologists is precisely to reveal these hidden puzzles.

Indeed, the psychological appeal of nations is puzzling once we consider the variety of alternative coalitional arrangements that are available, in principle, to an individual at any point in time. This fact becomes apparent in social contexts where the naturalness of nations is challenged: this happens in secessionist claims or during "ethnogenesis" – where individuals contest existing coalitional boundaries and support alternative ones (Horowitz, 1985). What makes some coalitional arrangements more psychologically compelling than the myriads of cognitively invisible alternative coalitions that could emerge? Why do some boundaries (e.g., "France," "Corsica"…) become cognitively plausible as the locus of political sovereignty and citizenship and not others ("Grenoble," "All bald people")?

An implicit objective of the target paper was to unravel the intuitive blindness that underlies the cultural success of national categories. The perception of a sociopolitical entity as a meaningful "nation" is not an arbitrary norm that is passively acquired from the social environment, but the result of complex computations, which we have summarized under the concept of "coalitional choice psychology" and described in sections 3 and 4. This psychology involves interpreting environmental cues to determine the most advantageous coalition – among all available options – in the individual's specific context. In turn, coalitional recruiters must strive to advertise their coalition, if they wish to secure the coalitional support of other people. This part of our theory was generally accepted by the commentators, but we provide three elements of clarification that we think can provide a preliminary response to many commentaries.

The first important clarification is the exact nature of the output of coalitional choice psychology. Importantly, the output of these computations is *not directly* cooperative behavior, but *support for a given coalitional arrangement*. What coalitional choice computations generate is the mental representation that a given coalitional arrangement is especially desirable – whether this representation applies to a group of friends, an ethnic group or a nation. Intuitively, one political preference that might emerge from this output is "I want an independent Corsica" or "I want Corsica to unite with France." Conversely, this mechanism might also categorize some coalitional arrangements as irrelevant: no social movement has ever called for the right to self-determination of "Grenoble" or "all bald people." Analytically, this mental representation is distinct from the motivation to *actually cooperate* with coalition members. At the large scale of entire nations, coalitional choice psychology merely generates the mental representation that *this coalitional arrangement is especially desirable*, leaving intact the typical collective actions problems that emerges in large-scale cooperation: although it would be especially productive if everyone in coalition X cooperated; individuals have a strong incentive to shirk (Olson, 1965; Ostrom, 2015). For instance, a person might in principle support the independence of Corsica without participating to Corsican collective actions.

In this sense, and this will be our second clarification, our theory does not call into question standard theories of large-scale cooperation. We agree with previous theoretical work that, ultimately, what stabilizes cooperation in large groups is a combination of *cultural systems of monitoring, reward and punishment* (often subsumed under the concept of "institutions") and reputational pressures (Acemoglu & Robinson, 2012; Liénard, 2014; Lie-Panis, Fitouchi, Baumard, & André, 2023; Olson, 1965; Ostrom, 2015; Powers & Lehmann, 2013; Powers, Van Schaik, & Lehmann, 2016). While institutions can explain how cooperation can be enforced in large groups, it does not explain why people *consent* to them. Yet, consent is central for the success of nation-building: when institutions are perceived as enforcing a coalitional arrangement that does not optimally benefit citizens, they risk being perceived as irrelevant – at best – or as unfair, extractive or oppressive. Therefore, institutional enforcement is insufficient to explain nation-building: we also need to explain why some coalitional arrangements are more appealing than others (e.g., why can the concept of "France" move the masses more than the concept of "Grenoble" or "all bald people") and why some large and abstract entities appealing *at all* (why do some people even care about something like "France").

The answer, we suggested, is in the way standard theories of large-scale cooperation intersect with coalitional choice psychology. Successful nation-building requires solid institutions and

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reputational pressure – but these mechanisms are only possible if they are seated on a coalitional arrangement that is perceived as *desirable* in the first place – which is the product of coalitional choice computations. Institutions matter, but coalitional choice psychology explains *why people support the creation of institutions around a given coalitional arrangement*. Reputation matters, but coalitional choice psychology explains *why people come to consider national cooperation as a special moral duty, and hence why it becomes beneficial to one's reputation to abide to national institutions*. In fact, this account resolves a feature of nationalism that would otherwise seem illogical: in high times of national threats, people support (and elites execute) both strong levels of patriotism *and* the implementation of authoritarian institutions to enforce national cooperation (e.g., Kuzio, 2016). These are the two legs of nationalism: the shared belief that the nation is a desirable social entity, and standard enforcement mechanisms that make this social entity possible. As a result, the task of the nation-builder is twofold as well: build stable institutions and advertise the nation as *desirable*.

Finally, our account of coalitional choice psychology emphasizes the flexibility of its outputs. Coalitional choice mechanisms merely generate the mental representation of desirable coalitional arrangements in the form of social categories that "feel" compelling, but the specific nature of this arrangement can manifest in myriad ways: nations, ethnic groups, world religions, fandoms, political parties (as noted by several commentators; e.g., **Hoffman & Moya**; **Moser**; see also Moya, 2023). In this sense, we certainly agree with **Maryanski and Turner** who perceived fitness interdependence – and any other input that might activate coalitional choice psychology – might "underpin[s] all sorts of diverse social formations." However, we do not concur with the claim that this necessarily assumes domain-general cognitive mechanisms. It is perfectly plausible that domain-specific cognitive mechanisms – mechanisms that take a narrow subset of stimuli in the world and process it in a specific way – can generate very different outputs. Moral cognition, for instance, can use the same narrow subset of stimuli (costs and benefits in social interactions) to generate a variety of justice principles (e.g., equality, equity, merit) (André, Fitouchi, Debove, & Baumard, 2022).

R2. Can fitness interdependence incentivize cooperation in large groups?

The most important implication of this underlying theory is that – contra the assumption of several commentaries (e.g., **Hoffman & Moya**; **Zefferman & Smaldino**; **Brusse & Sterley**) – our target article does not claim that fitness interdependence directly incentivizes cooperation in large groups. Perceived fitness interdependence between one individual and other group members is merely one of the inputs that can be fed to our coalitional choice psychology, leading to its immediate output: the mental representation of the group as a desirable coalitional arrangement. It is only indirectly, and in combination with more standard mechanisms of cooperation stabilization, that fitness interdependence can facilitate nation-wide cooperation. By making the group seem like a desirable coalitional arrangement, it can increase individuals' support for the emergence of institutions that will stabilize this arrangement and create a moral reputational pressure to act cooperatively with the nation (see esp. sect. 3.2).

Some commentators were concerned that we might have translated models of fitness interdependence in *dyadic* relationships to the realm of large-scale cooperation (**Brusse & Sterelny**), or that we were ambiguous in how we sought to do so (e.g., **Friedman**). We clarify this point here: when applied to non-dyadic contexts (or "groups"), we defined fitness interdependence as the *correlation between the fitness of a given individual with the average fitness of other group members*. This is very different from dyadic fitness interdependence, in which the correlation of fitness benefits is calculated between two individuals – as in the interdependence modelled by **Zefferman & Smaldino**). This definition was dismissed by **Brusse and Sterelny**, who argued that our focus on the "general welfare" of group members is an "uncashed metaphor"; yet we believe that it precisely captures the type of interdependence that should matter at the scale of large groups – because important acts of cooperation in large groups usually involves giving resources that are distributed widely across the group and not targeted towards one specific individual (e.g., war effort, taxpaying, nation-wide redistributive policies) (see Hechter, 2000; Tooby, Cosmides, & Price, 2006). We do agree with **Brusse and Sterelny**, however, that our use of the word "interdependence" is misleading in our context: as these commentators note, if an individual has a stake in the welfare of other group members, the opposite is unlikely to be true. Rather than talking about "interdependence" between an individual and other group members, a more adequate phrasing would be that individuals have a *stake* in the average welfare of other group members (Barclay, 2020).

Finally, our definition does not presume any higher-level selection mechanism – as suggested by **Kaufman, Kashdan and McKnight** or proposed by **Zefferman and Smaldino**. For an individual to develop an objective stake in the fate of other group members, it is enough that, for some reason, she perceives them as good recurrent cooperation partners who are difficult to replace (Barclay, 2020). If cooperation with a given set of individuals (e.g., "the French") is especially productive and forging alternative alliances is difficult, then people objectively have some stake in preserving the welfare of these individuals – which, again, does not necessarily translate into actual cooperative behavior because of the typical social dilemma posed by cooperation in large groups. Our paper precisely provides one such reason: *because group members have been involved in repeated interactions over time, which considerably increases the cost of switching coalitional arrangements.*

R3. Implications for the cultural evolution of historical myths

These points clarify a few recurrent concerns raised by the authors about the cultural transmission mechanisms that we outline in our article. On the one hand, several commentators asked why people would accept historical myths that are transmitted to them if they do not provide reliable information about their coalitional interests (e.g., **Wimmer**; **Blancke**; **Shao & Barlev**). In the target article, we argue that we actually do not expect that historical myths will be accepted without question. Humans are equipped with psychological mechanisms for epistemic vigilance that allows them to discard information that contradicts more reliable evidence (sect. 6.1). For instance, we took the blatant example of Ukrainians receiving historical propaganda from the Russian regime while experiencing oppression from Russian troops. In this setting, it seems unlikely that people will change their mind in the face of historical myths.

This has led other commentators to ask the related question: if historical myths cannot easily sway other people's opinion, why

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then would there be an interest in transmitting them? (e.g., **Blancke**). First, our theory allows for contexts in which historical myths can alter people's coalitional preferences: for instance, in situations where this information is *congruent* with other reliable evidence (sect. 6.1). This might be the case, for instance, when historical myths are propagated to the masses along with other concrete material benefits – typically in the form of access to public goods (Weber, 1976). In this case, there is no strong counter-evidence that might contradict the information brought by the historical myth. The other condition is that historical myths should be believable. This is precisely the endeavor that elites strive to achieve when propagating historical myths: they mobilize existing historical events and support their claims (often dubiously) by archaeological and historical material, to increase the credibility of the historical myths (sect. 4.3). Humans are not gullible, but they are not infallible either: in the absence of incongruent cues, and provided with sufficiently solid evidence, historical myths might have a chance to impact coalitional preferences.

Moreover, individuals may have incentives to transmit historical myths even when they have a small probability to be effective (e.g., due to the prevalence of incongruent cues). Indeed, the production of historical myths is not always costly, especially for leaders of nation-states. National ceremonies, commemorations and public discourses can be produced with a negligible cost relative to the total state budget. Another explanation, suggested by **Blancke** and **Shao and Barlev**, is that publicly advocating historical narratives can increase one's reputation as a committed coalition member. This account is plausible, although it is unclear how this signal might be perceived as credible. One solution is that the transmission of historical myths can become reliable signal of group commitment when it occurs in the presence of coalitional rivals – as in "burning bridges" signaling (Mercier, 2020, p. 193; see also Williams, 2022). A complementary solution is that while the transmission and endorsement of historical myths are not *sufficient* conditions to establish group commitment, they might be necessary. Individuals who reject historical myths that advertise their nation might be perceived as having alternative coalitional preferences (e.g., prefer unification with France over the independence of Corsica). This mirrors a similar phenomenon in the domain of moral religions: expressing the belief in a moral God that punishes moral violations is probably insufficient to establish one's moral character but might still be a productive reputational strategy – because atheists are perceived as less trustworthy (Fitouchi & Singh, 2022; Fitouchi, Singh, André, & Baumard, 2023; Gervais, 2013, 2014; Gervais, Shariff, & Norenzayan, 2011; Gervais et al., 2017).

Most importantly, it is enough that people *believe* in the efficacy of a cultural technology to explain its cultural success – without having to assume that their folk-intuitions are indeed accurate. Historical myths can spread in a population as long as people perceive that they have an interest in activating other group members' perception of fitness interdependence and have reasonable reasons to believe that historical myths can activate such perceptions (see sect. 6.2 for an extensive discussion of this point; also see Fitouchi et al., 2023).

R4. Historical myths are not the sole pathway to coalitional recruitment

R4.1. Reiterating the centrality of fair public goods provision

Our account of the coalitional choice mechanisms underlying the cognitive appeal of national categories addresses the point, raised by many commentators, that historical myths are not the only cultural technology that can be used for nation-building purposes. For instance, **Wimmer** noted that historical narratives have been used in a wide diversity of formats across social contexts, like "imperial stories of superior civilizational origins" that do not necessarily fit our definition of historical myths. Likewise, **Akers** emphasized the diversity of societal "meta-narratives" that structure group identities across the world but do not match with our description of historical myths: "meta-narratives" often emphasize the nation's shared beliefs (religious or secular) and shared goals, while our target article only addressed the rhetoric of shared roots. This focus makes it difficult to account for the varieties of nationalism that are not based on the belief in a shared ancestral history – like American nationalism.

We certainly agree that our target article is nowhere near explaining every aspect of nationalistic rhetoric. There are probably dozens of cultural technologies involved in the formation of national categories. In fact, this idea is consistent with our account of coalitional choice psychology: group commitment is the product of a flexible psychological mechanism which assesses the fitness benefits associated with membership in different coalitional arrangements. As such, any input can fuel national affiliation to the extent that it provides information about its associated fitness benefits. For this reason, we actually *expect* nationalists to invest in a wide range of cultural technologies beyond historical myths to attract coalitional support. In particular, we certainly expect that they will mobilize information about the present and future of the coalition. For instance, commentators have proposed that coalitional recruiters might advertise the nation's "cooperative prowess" in achieving coordination in the present (**Wolf**); shared goals and beliefs (**Akers**); the moral virtue of national heroes (**Wildes & Andrews**); or the magnitude of external threats (**Pietraszwski**; **Snijder & De Dreu**). In our target article, we also noted the existence of political uses of history beyond the scope of historical myths as we defined them and which probably play a substantial role in collective actions – for instance, raising awareness about historical grievances of marginalized groups (see sect. 2).

We also recognize that some of these cultural inputs should be significantly more psychologically compelling than historical myths in their capacity to alter coalitional preferences. In particular, a consistent finding in political science is that one of the most important drivers of national affiliation is the fair provision of public goods – or at least the perception thereof (Wimmer, 2018). In light of this finding, we certainly agree with **Friedman** that nationalists aiming to recruit coalitional support should primarily emphasize the quality and fairness of resource distributions across social groups – both in the present and in the past. And they certainly do: as historians have shown, one of the most consistent ideological tenets of nationalism is the belief in a horizontal comradeship between all group members – a rhetoric that is often produced with an aim to conceal domination and inequality (Anderson, 1991).

There is, however, one caveat to the claim that nationalists should advertise egalitarian access to public goods in their coalition – at least if "public goods" are understood in a purely economic sense. Indeed, as shown by **Sarkar and Sarkar** based on the Indian example, low-status individuals sometimes endorse nationalism even when the nation is highly unequal – presumably to their detriment (see Shayo, 2009). From an evolutionary perspective, this is not necessarily a paradox: individuals might still favor a coalitional arrangement in which they receive less strictly economic benefits if this loss is compensated with non-economic

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benefits to their fitness. In their commentary, **Sarkar and Sarkar** emphasize *status* and *protection* from (perceived) out-group threats as such non-economic benefits, and argue that this is what motivates low-status Hindus to tolerate high degrees of within-coalition inequality. This explanation is certainly plausible: low-status individuals might endorse an unequal coalitional arrangement if they perceive that they receive status gains and protection in exchange (Klor & Shayo, 2010). Interestingly, historical myths themselves might serve a similar purpose: not by providing status and protection but information about coalitional productivity. In advertising their coalition as especially productive and difficult to replace, recruiters might aim to convince low-status members that their subaltern social position is compensated by the added efficiency.

Overall, we easily recognize that historical myths activating perceived fitness interdependence through cues of repeated interaction over time are not the sole element with the potential to generate affiliation with large groups. Cultural evolutionary processes can generate a variety of technologies to achieve the same objectives while targeting the same human minds. For instance, fictions with imaginary worlds target specific cognitive mechanisms which explain why they have recurrent design features – yet they exist in an impressive variety of formats (Dubourg & Baumard, 2022). Likewise, the cultural technologies for nation-building that become prevalent in a given context might vary to some extent with ecological and cultural constraints: for instance, as suggested by **Wimmer** and **Akers**, historical myths might be more prevalent in countries that have an ancient history that they can exploit, but less so in countries like the United States, where European-Americans could not rely on ancient historical material.

What we do argue however is that historical myths are cross-culturally recurrent, and most importantly, that they are especially puzzling. The combination of these two factors is how we justify the focus of our main article. It is unsurprising that nationalists emphasize the present and future benefits that can be derived from national commitment; or that social movements use history to highlight historical grievances; but it is puzzling that nationalists care so much about their nation being ancestral and continuous (see sect. 2 for a discussion of this point).

R5. Proximate accounts

R5.1. Proximate mechanisms add interesting descriptive layers, but do not necessarily improve explanatory power

The coalitional choice psychology framework can also address concerns regarding the relationship between the ultimate logic of group affiliation and its proximal manifestations. Indeed, several commentaries proposed alternative of complementary accounts to our theory of historical myths by emphasizing *proximal* mechanisms. We recognize that our target article was focused on the ultimate logic and cognitive mechanisms driving the cultural evolution of historical myths while leaving out important proximal mechanisms at play.

Generally, we agreed with the authors who proposed proximal complements to our theory. Some of them discussed possible phylogenetic pathways that might have contributed to the human ability to produce historical myths. **Benitez-Burraco** stressed the decisive role of the human ability for language and storytelling in the evolution of large-scale cooperation and proposed two evolutionary pathways to account for it. Similarly, **Maryanski and Turner** suggested that "Machiavellian" social manipulation – similar to coalitional recruitment in humans – is found in chimpanzees, suggesting that this trait might date back to early hominoid ancestors. Both accounts are plausible, although more research is needed to establish these hypotheses. Other commentators focused on *psychological* proximal accounts: **Kaufman, Kashdan and McKnight** and **Kardos** suggest that the appeal of historical myths stems from psychological needs (e.g., for meaning, belonging, continuity, or entitativity). Drawing on Social Identity Theory, **Kardos** links these needs to social identification, which ultimately fosters within-group cooperation. Similarly, **Pelletier and Fay**, **Wildes and Andrews** and **Oatley and Wu** insist that historical myths do not merely provide information about the fitness interdependence of group members, but also elicit emotions or "affective states" that also play an important role in nationalist rhetoric. In particular, **Pyszczynski, Solomon and Grenberg** stress the role of death anxiety in motivating social identity. We certainly acknowledge the fundamental role of psychological needs and emotions on decision-making, especially when it comes to group affiliation.

Finally, we agree with **Elster and Glowacki** that historical myths activate cues of self-concept and thus help group members represent their group as a "quasi-coherent self with distinct characteristics, goals and desires." As suggested by these authors, representing social groups in this way is likely beneficial and might serve as a basis for more complex computations (e.g., representing stereotypes, group "goals" or "desires," see Tooby et al., 2006). It is less clear, however, how representing the group as a coherent entity leads specifically to coalitional preferences. The authors propose that this is because the perception of a coherent group-self might increase individuals' interest in group-level benefits but this causal mechanism is underspecified. One possible answer is that the perception of a coherent group-self actually reflects perceived fitness interdependence between group members – which is why it motivates coalitional affiliation. More research is needed to test this hypothesis.

Overall, while we agree that these accounts add interesting layers to our theory, it is unclear whether they alter the main predictions of our model. Proximate mechanisms are certainly indispensable for evolutionary theories, but only to the extent that they yield novel predictions that would not be expected by sole reliance on the theoretical tools of evolutionary biology – the "phenotypic gambit" of human behavioral ecologists (Nettle, Gibson, Lawson, & Sear, 2013). For instance, evolutionary psychologists are interested in the evolved cognition of humans because it can explain why humans sometimes engage in maladaptive behaviors in industrial environments (Li, Van Vugt, & Colarelli, 2018). Similarly, considering phylogenetic or neurobiological constraints can explain why apparently sub-optimal traits evolve (Nettle et al., 2013). In our case, the contribution of proximal accounts beyond the cognitive processes we describe in the main article is less clear. More research is needed to investigate whether the study of storytelling capacities (**Benitez-Burraco**), emotions (**Pelletier & Fay**, **Wildes & Andrews**, **Oatley & Wu**) or psychological needs (e.g., **Kaufman, Kashdan & McKnight**, **Kardos**) can make new predictions about the cultural success of historical myths.

R5.2. Proximate accounts are not alternatives to ultimate accounts

Conversely, we disagree with commentaries that presented proximal accounts as *alternatives* to our ultimate model (e.g., **Kardos**).

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Most of the proximal mechanisms cited in the commentaries are not alternatives to our account but are likely the proximal manifestation of the ultimate logic we described. We have no doubt that people experience visceral and measurable emotions and psychological needs related to their social identity – for example, need for belonging, need for continuity, etc. What we propose is that most of these visceral affective states might be design features of cognitive mechanisms that motivate individuals to engage in behaviors that are beneficial to their reproductive success – just like the visceral desire for an attractive mate is a feature of our mating cognition. For instance, the "need for belonging" is likely the proximate psychological mechanism that motivates humans to secure membership into a reliable group of social partners and "need for continuity" might be the proximal motivation that pushes people to attend to cues of repeated interactions over time and commit to more interdependent groups. Likewise, successful historical myths might indeed reduce anxiety, not by providing an abstract sense of permanence, but by showing the group as a cohesive entity that is able to provide valuable fitness benefits. This account is compatible with the evidence provided by **Pyszczynski, Solomon and Grenberg** – much of which we cited ourselves and analyzed in light of our account in the target paper (see sects. 4 & 5).

The same line of reasoning applies for emotions. From an evolutionary perspective, emotions are a coordinated adaptive response to adaptive challenges in our environment – for instance, fear coordinates coherent physiological and perceptual responses to the presence of imminent threats (Al-Shawaf, Conroy-Beam, Asao, & Buss, 2016). Thus, some of the emotions elicited by historical myths, like "security" or "intimacy" (**Wildes and Andrews**) might represent a psychological response to the recipients' perception of fitness interdependence with other group members. However, in light of our theory, we believe that the emotions that might play the most important role in national affiliation were not mentioned in the commentaries. First, previous research suggests that *empathy* is the emotional marker of perceived interdependence (Fitouchi, André, & Baumard, 2024). For this reason, we expect that successful historical myths – and more generally, successful nation-building – should elicit empathy toward other group members. Similarly, because coalitional choice psychology can lead to *moral* representations about what constitutes a mutually beneficial coalitional arrangement, national affiliation might elicit a sense of *moral duty* – or, in cases where individuals are imposed a coalitional arrangement that is not perceived as mutually beneficial, *anger* (André et al., 2022; Fitouchi, André, & Baumard, 2023). Overall, this discussion shows the limitations of traditional philosophical divides between rationality and emotion ("Logos" and "Pathos," following **Pelletier & Fay**). Emotions and other psychological needs are *instincts* that are felt viscerally, but they are also "rational" – in the sense that have evolved to solve adaptive problems, and result from complex computations of fitness costs and benefits (Al-Shawaf et al., 2016).

Ultimate and proximal explanations are therefore complementary: ultimate theories provide the evolutionary logic for the existence of a trait, while proximal theories uncover how this trait manifests. However, proximate theories that rely on psychological needs and emotions without considering ultimate-level mechanisms run the risk of producing almost tautological explanations – equivalent to claims like: people eat because they have a need for food and have sex because they have a need for pleasure. These accounts also tend to raise more questions than they solve: why do people have such needs and emotions in the first place? In the absence of first principles from which needs can be inferred, psychological needs might become ad-hoc explanations of human behavior.

One commentary explicitly addressed this critique: **Pyszczynski, Solomon and Grenberg** propose that historical myths are appealing because they alleviate death anxiety; and they justify this psychological need with anxiety's presumed deleterious effect on "diverse biological and psychological systems that facilitate individual survival." We raise several concerns about this interpretation. First, the proposed evolutionary mechanism is underspecified. The authors mention that historical myths "enable people to view themselves as valuable contributors to something great that stretches far into the past and that will endure indefinitely," but it remains unclear why people should perceive this information as reducing the "inevitability of death." Second, the authors wrongly assume that anxiety is systematically detrimental to survival and reproduction. In contrast, evidence shows that anxiety is an adaptive mood that is triggered by threatening environments and generates adapted physiological and cognitive responses (e.g., higher threat sensitivity) – which does not mean that there cannot be pathological forms of anxiety (Nettle & Bateson, 2012). Relatedly, the authors claim that people might feel anxious because of the *inevitability of death*. But from an evolutionary perspective, it would make no sense to react to a threat that is so general and, by definition, inevitable (Kirkpatrick & Navarrete, 2006). Rather, evidence shows that threat-detection mechanisms react to specific and avoidable threat with adaptive responses, like pathogens, predators or coalitional rivals (Neuberg & Schaller, 2016). Cognitively, humans do not fear "death" but fear specific features of their environment that may compromise their fitness. Thus, if it is indeed true that historical myths alleviate death anxiety, a compelling theory must provide an evolutionarily plausible reason for why information about the ancient history of one's group can lead to fitness gains.

R6. Alternative ultimate accounts

R6.1. Uncertainty reduction

Several commentators suggested alternative *ultimate* accounts for the cultural success of historical myths. One recurrent proposal was that historical myths might serve an epistemic function, providing a shared framework for interpreting social interactions. For instance, **Moser** suggested that they serve as "meta-heuristics for ensuring that members of a common group follow the same norms, envision the world with a shared ontology, and respond to new problems in the same way." Similarly, **Grüning and Krueger** proposed that myths "provide[s] a behavioral framework for the world that reduces the cognitive load of decision making." This account is convincing but might not explain the same types of historical narratives as the ones we emphasized in the target article. Uncertainty-reduction theories are well-suited to explain myths that provide information about the distinct customs and values of group members – like the myths described by **Oatley and Wu** – but are less suited to explain historical myths that emphasize cooperative events and long histories. Future research might disentangle the two accounts by testing how relevant psychological constructs (e.g., uncertainty aversion and national identification) predict the endorsement of historical narratives.

R6.2. Cultural group selection and arbitrary group norms

Other commentators rejected our claim that the cultural evolution of historical myths could be explained in the absence of group-

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level processes and proposed alternative accounts based on cultural group selection theory. First, **Smaldino and Zefferman** proposed that group boundaries reflect the scale of cultural variation – because this is the scale at which parochial behavior is favored by group-level cultural selection. As a result, the function of historical myths might be to "clarify the scale of existing cultural variation." However, this idea does not account for the immense malleability of group boundaries – far beyond the constraints of cultural similarity – that we detailed in section 3. As political scientists have repeatedly shown, ethnic and national group boundaries are malleable and often reflect contextual incentives more than sincere attachment to cultural homogeneity (Habyarimana, Humphreys, Posner, & Weinstein, 2007). This is well illustrated by a seminal paper showing that the Chewa and Tumbuka ethnic groups are allies in Zambia but rivals in Malawi – despite being culturally similar across borders, and reflecting different incentives for alliances in both countries (Posner, 2004). Cultural (especially linguistic) similarity can certainly play an important role in coalitional preferences, to the extent that sharing culture reduces transaction and coordination costs, but other incentives (e.g., shared goals, common threats, efficient institutions) can substantially reduce and sometimes cancel preferences based on cultural similarity (e.g., Habyarimana et al., 2007). Finally, this account does not explain the design features of historical myths. Per **Smaldino and Zefferman**, nationalists should simply advertise the cultural homogeneity of their nation – which they often do – but not advertise the nation's long history of cooperation.

Second, **Hoffman and Moya** propose a game-theoretical model to claim that large social groups may not "be based on anything "real"" – as long as all group members have a shared understanding of group boundaries. This claim is similar to other commentaries, who stressed the coordination role of historical myths. **Wolf** points to evidence that shared mental representations stimulate cooperation; and proposes that it is the observation that *group members have achieved a shared representation of the past* that make historical myths compelling for coalitional choice. **Fonagy and Campbell** make a similar point when they attribute the appeal of historical myths to their capacity to elicit a "shared cognition" (i.e., shared intentionality, shared goals and mutual recognition).

The coordination of minds and behaviors is certainly an important feature of group formation. As evolutionary psychologists have claimed: "groups do not objectively exist: they only exist to the extent that they are represented in mutually consistent ways in the minds of assorted individuals" (Tooby et al., 2006; p. 111). Accordingly, people are highly sensitive to cues that indicate common knowledge of relevant information among a group of participants – and use these cues to motivate cooperation (De Freitas, Thomas, DeScioli, & Pinker, 2019; Deutchman, Amir, Jordan, & McAuliffe, 2022). This probably explains why historical myths are often publicly displayed in ostensible rituals – typically in the forms of national commemorations (e.g., Ben-Amos, 2000). Contra **Hoffman and Moya**, however, we note that this claim does not need to presume any group-level mechanism: a plausible alternative is that elites have an intuitive understanding of human social cognition and have a direct incentive to publicly display historical myths to recruit coalitional support.

More generally, we disagree with the claim that coordination is the sole driver of coalitional choice, and therefore that what individuals decide to coordinate on is arbitrary. Consistent evidence from across the social sciences shows that coalitional choice in humans (including in large natural groups) depends on a variety of variables – all of which are indicators of the potential fitness costs and benefits associated with group membership: shared goals (Noyes & Dunham, 2017), common threats (Barclay & Benard, 2020), expectation of reciprocity (Yamagishi & Kiyonari, 2000), institutional quality (Bartoš & Levely, 2021), reputation circulation (Habyarimana et al., 2007), and, we suggest, perceived fitness interdependence (e.g., Swann et al., 2014). In psychology, the notion that mere coordination is sufficient to establish group boundaries is reminiscent of the minimal group paradigm – in which researchers found that mere allocation to an arbitrary group was sufficient to elicit in-group favoritism (Tajfel, 1982). But precisely, subsequent studies have found that in-group preferences in minimal groups readily disappear when other sources of incentives are introduced (e.g., reputational incentives and reciprocal cooperation) (Balliet, Wu, & De Dreu, 2014). Lastly, there are abundant examples of *failed* nation-building – cases where people refuse a given coalitional arrangement despite strong coordination cues from state-level public propaganda (see sect. 2).

These elements demonstrate that pure coordination is insufficient to establish group boundaries in individual minds. Our suggestion is that while coordination is important, individuals want to coordinate on coalitional arrangements that are otherwise desirable. This explains why cultural technologies are not arbitrary, but tend to exhibit recurrent cross-cultural (not necessarily universal) patterns – as those of historical myths.

R6.3. Andreas Wimmer's theory of nation-building

Wimmer wrote an especially detailed critique of our target article. His commentary explores a promising avenue for testing our theory using large cross-country datasets. It also gives us an opportunity to discuss the relevant measures to do so. Indeed, the "foundation year" variable that was used as an outcome variable by **Wimmer** in his regression model is not suited to test our main hypotheses because it was designed to measure the *objective* date of birth of an ethnic group. To collect this data, Kaufman asked *experts* when they thought that an ethnic identity first emerged and explicitly noted that he was not "concerned with the group's own claims, which often stretch back much further than what is warranted by the historical record" (Kaufmann, 2015). Yet, it is precisely the "group's own claims" on the antiquity and continuity of their nation that matters for our theory. The target article is very clear that historical myths are *mental representations of the past* that are likely to diverge from expert opinions. Future studies using large datasets should select an outcome variable that measures group member's subjective rather than objective representations of their history. Collecting subjective data will also shed light on intra-group variability in the endorsement of historical myths – as we expect that not all group members hold the same representation of their past (see sect. 6.1).

We actually provide such data in the main article – despite the commentary claiming otherwise. We cite numerous psychological experiments showing that people readily endorse the belief their nation has an ancient and continuous history; and that this endorsement is significantly higher in people who identify with their nation more, who are exposed to information about the disappearance of their group, and who are more exposed to threat cues (see sects. 4 & 5). However, we agree with Wimmer that this data is imperfect, relies too heavily on Western samples, and needs to be tested outside the lab.

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Finally, **Wimmer** referred us to his own "modernist" account of nationalism (Wimmer, 2018). We believe that our respective accounts are quite compatible in that they both assume that successful nation-building is premised on the quality of intra-group cooperative exchanges. One key difference in our approaches is that Wimmer (2018) emphasizes the relationship between citizens and the state, which we also recognize as an important driver of coalitional choice (see R1 & R2) – whereas our target article also emphasizes the (perceived) horizontal bonds between individuals. Another difference lies in our relative disciplinary focus. As a political scientist, Wimmer (2018) is interested in the objective determinants of successful nation-building (i.e., public goods provision), whereas psychologists are interested in individuals' subjectivity (e.g., *perceived* public goods provision). Integrating the two disciplines in the study of nationalism is crucial as what ultimately drives behavior is what people perceive, and how this information is processed in our minds.

R7. Promising avenues for future research

R7.1. Positive and negative historical narratives

Finally, several commentators suggested promising avenues for extending and broadening our research work. A first line of investigation for future studies is to differentiate historical myths and their psychological impact based on their valence. Indeed, some authors questioned our decision to focus on historical myths that describe *positive* past interactions, when so many national narratives are based on national traumas. For instance, **Wimmer** cites the historical "tales of victimhood, defeat and injustice" that prevail in Polish nationalism and Zionism. **Bilewicz and Bilewicz** make a similar point, although they note that myths of shared suffering may in fact reduce national cohesion. These observations are consistent with historical research showing the prevalence of negative themes (e.g., crushing military defeats) in nationalist rhetoric; and with psychological evidence that shared *negative* experiences are more likely to generate identity fusion than shared positive experiences (Whitehouse et al., 2017).

Here, we propose a tentative explanation for this apparent paradox, although more research is needed to support our claims. We suspect that, generally, these disastrous narratives are not displayed for their own sake. Rather, they are typically used as a narrative device to highlight the heroic self-sacrifice of ancestors (e.g., Serbian nationalism: Bieber, 2002; Lomonosov, 2021; in Israeli nationalism: Ben-Amos, 2003; Gal, 2009). A striking example is how the siege of Masada – during which a battalion of Jewish soldiers self-sacrificed to fight Roman oppressors in 73-74 CE – became a central symbol of Israeli nationhood despite being a military defeat. The story of Masada was explicitly used to "inspire many Israelis and Jews to greater heroism and self-sacrifice" (Smith, 1999, pp. 179–180). The phrase "Masada shall not fall again" has become a rallying sign for Israeli nationalists, and Masada remains one of the most visited places in Israël, showing the prominence of this narrative (Gal, 2009; see also Ben-Yehuda, 1996).

Two evolutionary mechanisms may explain the appeal of tales of heroic self-sacrifice for nationalist coalitional recruiters. First, the public celebration of group members who risk their lives for the nation sends a powerful signal that such behavior is socially valued and will be rewarded. In certain conditions (e.g., when death probability is compensated with even greater potential benefits) these incentives can motivate extreme pro-group behavior (Dessalles, 2018). This idea was confirmed in a recent model, showing that a propensity to pay tribute to self-sacrificial heroes might coevolve with the presence of heroic acts in a social group (Dessalles, 2024). A second possibility is that martyrological narratives serve as a hyper-stimulus of costly helping (Barclay, Bliege Bird, Roberts, & Számadó, 2021). By observing costly self-sacrifice from other coalition members, recipients can infer that they are highly valued by other members and therefore, that the fitness interdependence that binds them is high (Barclay et al., 2021). In our target article (sect. 4), we suggested that cues of repeated interactions over time might be perceived as having a greater impact on perceived fitness interdependence if these interactions were especially costly to participants. Thus, by emphasizing heroic acts of costly helping in the past, coalitional recruiters may hope to reinforce the commitment of group members.

R7.2. Are historical myths detrimental to social cohesion?

These hypotheses address **Wimmer**'s observation that nationalism is often founded on tales of victimhood, but do not explain **Bilewicz and Bilewicz**'s remark that endorsing such tales has deleterious effects on social cohesion. In particular, these authors cite evidence that endorsement (or exposure) of traumatic collective memories are associated with more paranoia, conspiratorial beliefs and obsession with treason – which might ultimately damage social cohesion. These observations are consistent with the view of **Kaufman, Kashdan and McKnight** who also stress the negative psychological effect of historical myths – although their focus is on positive narratives. In strengthening the cohesion of the majority group, these authors argue, positive historical myths might contribute to the stigmatization of marginalized groups and dissenting in-group members – and stifle their creativity.

In fact, these psychological responses to historical myths – positive or negative – are not incompatible with their potential positive effect on national commitment. Recall that the output of coalitional choice psychology is not directly cooperation, but the mental representation that a given coalitional arrangement is desirable – leaving the possibility that people might shirk their national obligation. When the incentives and consequences of cheating are especially high – as it is usually in times of national trauma – we might actually *expect* that commitment to the nation will translate into a greater motivation to monitor and sanction other group members. This probably manifests psychologically in the form of paranoid thinking, conspiratorial beliefs or exclusionary attitudes toward dissenters (Greenburgh & Raihani, 2022). In line with this idea, attachment to the homeland and nationalism are positively correlated with Right-Wing Authoritarianism – showing that people who support a given coalitional arrangement *also* support more stringent social control to maintain its boundaries (Osborne, Milojev, & Sibley, 2017). Future research might further investigate the negative traits associated with the endorsement of historical myths.

R7.3. Historical myths for attack and defense

Third, **Snijder and De Dreu** raise an interesting debate on the contextual variability of historical myth prevalence. Our target article predicted that historical myths would spread more in societies engaged in warfare because group members need more costly investment from each other (sect. 5.1), but it remains unclear whether this prevalence should vary between attack and defense situations. **Snijder and De Dreu** convincingly show that group

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members are more interdependent in defense than in attack and conclude that historical myths will be more prevalent in attack situations. We generally agree with this logic but introduce a possible caveat. Defense situations are indeed more prone to fitness interdependence between group members, but they also make cooperation failures more costly – and possibly dramatic. The severe cost of losing against invaders might incentivize group members to transmit historical myths. More research is needed to determine which of these two opposite effects trump the other and how this affects the circulation of historical myths.

R7.4. Toward a psychological science of the historical discipline?

Finally, our research might open broader research question related to the psychological appeal of history in general. In their commentary, **Pietraszewski and Moncrieff** convincingly demonstrated that the cross-cultural interest of humans for history represents a puzzle for social science beyond the study of historical myths. Interest for history, these authors argue, recycles important cognitive templates like the ones involved in retaliatory behavior. We certainly concur with the author's call for an adaptationist cognitive science of history and hope to see future studies addressing these questions.

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