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Experimental Games and Social Decision Making

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Keywords

games, social interaction, cooperation, conflict, collective action, social norms

Abstract

Experimental games model situations in which the future outcomes of individuals and groups depend on their own choices and on those of other (groups of) individuals. Games are a powerful tool to identify the neural and psychological mechanisms underlying interpersonal and group cooperation and coordination. Here we discuss recent developments in how experimental games are used and adapted, with an increased focus on repeated interactions, partner control through sanctioning, and partner (de)selection for future interactions. Important advances have been made in uncovering the neurobiological underpinnings of key factors involved in cooperation and coordination, including social preferences, cooperative beliefs, (emotion) signaling, and, in particular, reputations and (in)direct reciprocity. Emerging trends at the cross-sections of psychology, economics, and the neurosciences include an increased focus on group heterogeneities, intergroup polarization and conflict, cross-cultural differences in cooperation and norm enforcement, and neurocomputational modeling of the formation and updating of social preferences and beliefs.

Contents

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INTRODUCTION

How interdependent individuals and groups shape their own and others' future can be analyzed and studied with experimental games. Such games model situations in which (*a*) several agents, such as individuals or groups, must each make one or more decisions that affect their own and others' welfare; (*b*) the welfare consequences of these decisions can be expressed in numerical form; and (*c*) the numbers that express these welfare consequences are chosen beforehand by the experimenter (Pruitt & Kimmel 1977). Experimental games allow us to understand human decision making in complex social problems such as public goods provision, shirking at work, peace negotiations, business transactions, collective action against climate change risks, and competition within and between groups of people.

Mixed-motive decision making: situations in which players choose between strategies that are most profitable individually and strategies that are most profitable collectively

Early *Annual Review of Psychology* articles (Dawes 1980, Pruitt & Kimmel 1977) focused on the prisoner's dilemma game and social dilemma games in which individuals face a problem of cooperation, whereby not cooperating yields for each individual higher personal outcomes and cooperating yields higher collective outcomes (see the sidebar titled Game Theory and Experimental Games). Later reviews also included coalition formation and bargaining games, in which individuals face an additional problem of coordination on some contract that is acceptable to all or most participants (Carnevale & Pruitt 1992, Komorita & Parks 1995). Here we review three developments since these early reviews. First, there has been an expansion in the type of experimental games and the questions asked around cooperation and coordination. Second, and partly because of these methodological innovations, notable advances have been made in understanding the psychological factors underlying mixed-motive decision making and their neurobiological correlates.

GAME THEORY AND EXPERIMENTAL GAMES

The design and use of experimental games are inspired by game theory (Samuelson 2016). Games consist of agents, each of whom has a finite set of strategies that in combination determine each agent's outcome. Initially developed for mathematical analyses of what agents (should) do to achieve efficiency—i.e., the combination of strategy choices that earns agents the most collectively—or in terms of the game's Nash equilibrium—i.e., what an agent's most profitable strategy is, given a particular strategy chosen by the other agent(s)—game theory has been used to identify when and why decision making is inefficient or out of equilibrium (Ostrom 1998, Schelling 1960). Their logic and analytical sophistication notwithstanding, formal analyses often paint a weak picture of how people actually behave. This led Schelling (1960, p. 162) to conclude that "the mathematical structure of the payoff function should not be permitted to dominate the analysis." Research on experimental games thus complements game theoretical analyses with insights on how people actually behave. Whereas research using games developed in experimental economics independently from that in (social) psychology (Komorita & Parks 1995, Ostrom 1998), the present review reveals increasingly strong convergence between these disciplines in both theory and research methodologies.

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Third, the use of experimental games has become increasingly interdisciplinary. We conclude with new trends and developments that are taking shape at the cross-sections of psychology, economics, and the neurosciences.

GAMES FOR MIXED-MOTIVE DECISION MAKING

Figure 1 gives four archetypical games for studying mixed-motive decision making (see also the sidebar titled Implementing Games in the Laboratory). A distinction underlying these games is whether decisions are made simultaneously or sequentially (Crawford 2019, Mauersberger & Nagel 2018). Methodological innovations within each of these archetypical types have opened up new possibilities for exploring when and why people cooperate or compete, coordinate toward some mutually acceptable contract or collective action, and develop and enforce group norms for cooperation.

IMPLEMENTING GAMES IN THE LABORATORY

Some researchers in the psychological and management sciences embed the game's payoff structure in micro-worlds that mimic the richness of real-life decision making as much as possible. For example, experimental games of (multi-issue) negotiation have placed undergraduate students in the roles of management and union representatives when negotiating agreement on salary raises, health care benefits, and vacation days. Other researchers, mostly in decision and economic sciences, keep experimental games context-free. Experimental instructions avoid allusions to real-life analogues such as overfishing or warfare, decision options are given neutral labels, and outcomes are set in money or monetary units. This avoids that implicit norms and role expectations (e.g., stereotypic beliefs about what union representatives typically want) restrict generalizability to settings with the same interdependence structure. A context-free implementation, while abstracting away from felt realism or local concerns, allows for tractable modeling of decision making as it may occur in a range of different problems, including overfishing, trade wars, antibiotic resistance, or shirking in organizations. It can also help cross-disciplinary exchange and consilience across social and behavioral sciences concerned with basic mechanisms underlying human cooperation and coordination.

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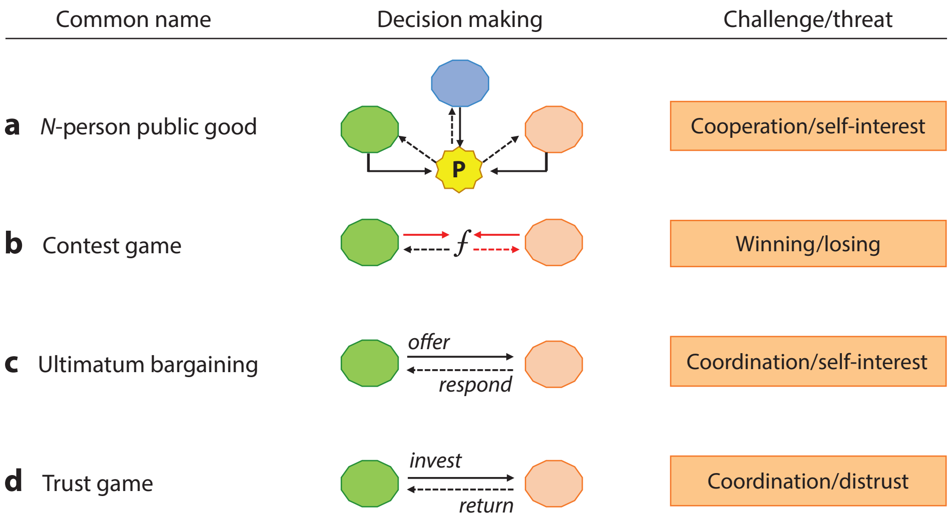

Figure 1

Common games of mixed-motive decision making. Individuals have an endowment e from which they can make contribution x; contributions (*solid arrows*) are non-recoverable, and individuals keep $e - x$. Returns to the individual can be positive (*black dashed arrows*) or negative (*red dashed arrows*). (*a*) In N-person public good provision, individuals can contribute to a common pool P. Total contributions gain in value at factor k (with $1 < \frac{k}{N} < N$). Each individual receives a return from P regardless of their contribution. (*b*) In a contest game, individuals can invest to obtain a reward or avoid a punishment. The contest success function f sets the conditions for winning the contest (e.g., the individual who invested the most) and its consequences to all contestants (e.g., whether winners earn the losers' non-invested resources). (*c*) In ultimatum bargaining, a first mover (proposer) offers $e - x$ to themselves and x to the second mover (responder). When the second mover rejects the offer, both first and second movers earn zero outcomes. (*d*) In the trust game, a first mover (investor) transfers x to the second mover. Transfers gain in value (commonly $k = 3$), and the second mover then decides how to distribute the final resource ($x \times k$) between themselves and the first mover.

Games with Simultaneous Decision Making

The problem of cooperation in groups is often studied in the context of public goods, such as public health care and national security, that are accessible to all people regardless of whether and/or how much they contributed to its provision (Van Lange et al. 2013). In variants of the game, cooperative effort can be aimed at preventing a public bad such as the spreading of contagious disease (Cartwright et al. 2019, Gross & De Dreu 2019b, Hardin 1968) or at regulating the use of a common resource that regenerates better the less individuals harvest (Van Lange et al. 2013). In all these variants, cooperating is efficient but threatened by the individual's temptation to not contribute (or to harvest maximally). Indeed, free-riding can result in what Hardin (1968) famously called the "tragedy of the commons."

Free-riding: not contributing towards efficiency, typically serving the individual's personal interests best and exploiting others' cooperation

Contest success function: the rule that determines which participant(s) win the contest and with what consequences to the winner(s) and loser(s)

Public good provision games are ill-suited to answer when and why people compete with other individuals or groups for status, market share, or access to a limited resource such as food or territory. To address this question, psychology increasingly turns to contest games (also referred to as rent-seeking games; Dechenaux et al. 2015, Kasumovic et al. 2017) (see **Figure 1*b***). Individuals invest resources to maximize personal gain and/or to prevent losing against other contestants. At the same time, investments are non-recoverable, and engaging in the competition reduces collective welfare. Manipulating the contest success function reveals the specific reasons for (not) allocating resources to competition. For example, recent work created asymmetric attacker-defender contests that tease apart the appetitive motivation to win against others and the aversive motivation to avoid losing against others. Typically, individuals invest more resources to protect against loss than to achieve victory (Chowdhury & Topolyan 2016, De Dreu & Gross 2019).

Sequential Decision-Making Games

Sequential games allow participants to adjust their decisions to each other while trying to coordinate on mutually acceptable outcomes. This is traditionally studied with ultimatum bargaining games and trust games (**Figure 1*c*,*d***) or by adding to standard public good provision games a sequential decision-making protocol in which one player announces their contribution, then the second player announces their decision, and so on (Arora et al. 2016, De Dreu et al. 2016, Gavrilets & Fortunato 2014). Implementing sequential decision-making protocols in public good provision games has been used to model, for example, leader–follower dynamics underlying coordination and collective action (Cappelen et al. 2016, Gächter & Renner 2018).

Sequential decision making can also be used to identify when and why first movers "set the stage" and second movers "get the job done": In an ingenious setup, Weisel & Shalvi (2015) engaged dyads in a die-rolling task. Die rolls were strictly private, and individuals reported the number they threw. Individuals received more money the higher number they reported, giving them an incentive to lie about the number they actually rolled. In this dyadic version of the die-rolling task, however, payout occurred only when both members of a dyad reported the exact same number. In a sequential-play variant of the task, one dyad member reported their roll first and then the other member reported their roll. Weisel & Shalvi observed that such sequential decision making led to what they termed "corrupt collaboration": The first mover set the stage by (dishonestly) reporting a high number and the second mover then got the job done by (dishonestly) reporting the exact same number.

Coordination in sequential decision-making games benefits from knowledge about second movers' (e.g., responders', trustees') preferences, yet oftentimes second movers can (dis)honestly provide such information prior to decision making and serve personal rather than collective interests (He et al. 2019, Mauersberger & Nagel 2018). Communication and signaling are studied in sender–receiver games in which receivers, as second movers, choose between options that only the sender, as first mover, can (dis)honestly reveal (e.g., Ellingsen et al. 2018, Vranceanu & Dubarth 2019). This allows researchers to identify to what extent, and when, senders manipulate such signals to facilitate coordination on some personally beneficial contract. Similar inductions of private information have been exploited in ultimatum bargaining and trust games (Besancenot et al. 2013, Khahnetski et al. 2017, Kriss et al. 2013) and by giving first and/or second movers insight into their counterparts' facial cues or emotion statements (Bonnefon et al. 2013, Geniole et al. 2019, Kret et al. 2015, Prochazkova et al. 2018, Van Leeuwen et al. 2018). These innovations allow for an in-depth study of whether and when players detect signals as being honest or deceitful.

Repeated Interactions and Partner Selection

Notable exceptions aside (e.g., Axelrod & Hamilton 1981, Fehr & Gächter 2000), older work using public good provision and contest games focused on one-shot decisions in which participants share neither a past nor a future and have limited possibilities for learning. Experimental economics, and more recently psychology, has increasingly examined repeated decision making in which participants receive, between decision rounds, feedback about the decisions made by others. In fixed-partner matching protocols, participants make a series of decisions with the same partner, which allows them to coordinate on some level of contribution or, in contest games, to

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learn how to compete best and reduce waste. In random-partner matching protocols, participants make a series of decisions each time with a new partner, which allows them to learn and develop general population responses (for examples, see FeldmanHall et al. 2018, Fontanesi et al. 2019, Rojek-Giffin et al. 2020).

In games with repeated play, players are sometimes given the opportunity to choose or exclude interaction partners from future interactions (e.g., Barclay 2016, Bernard et al. 2018, Gross & De Dreu 2019b, Martin & Cushman 2015). Introducing partner selection allows researchers to identify the role of history of play and reputation cues and to explore how these factors contribute to the emergence of cooperation and the escalation of competition and conflict (Fehr & Schurtenberger 2018). We return to this below when we discuss the role of indirect reciprocity as a key factor underlying human cooperation and coordination.

Partner selection: the extent to which agents can include or exclude each other in future decision making

Indirect reciprocity: cooperating (versus competing) with those who have a known or suspected positive, cooperative (versus negative, competitive) reputation

Partner control: the extent to which interacting individuals can punish or reward others' decision making

Punishment, Reward, and Partner Control

Perhaps the most prominent and widespread innovation in the field is the inclusion of sanctioning options, building on pioneering work by Yamagishi (1986) and Fehr & Gächter (2000). In these games, participants are given an endowment and, following a round of decision making, assign all or parts of this endowment to punish or reward one or more other participants in the game. Punishment (or reward) is costly to the punisher but costlier (or more rewarding) to the target of punishment (or reward), often at a 1:3 ratio (for examples, see Baldassarri & Grossman 2011, Engelmann et al. 2019b, Molenmaker et al. 2016). Other studies considered third-party sanctioning, in which individuals uninvolved in the mixed-motive decision making assign punishment (or rewards) to one or both of the interactants (for examples, see Chavez & Bicchieri 2013, Jordan et al. 2016, Molenmaker et al. 2014, Stallen et al. 2018).

When sanctioning decisions are made only once, punishment and reward can restore the unfairness that resulted from participants' free-riding and/or relieve decision makers' anger and empathy. When decisions are made repeatedly, second- and third-party sanctions afford partner control. Sanctions signal what is (un)desirable and thereby can shape future cooperation and coordination. The inclusion of sanctioning in experimental games with repeated play has, accordingly, contributed substantially to our understanding of when and how individuals manage reputations and how groups develop norms for cooperation and coordinate collective action through (in)direct reciprocity.

FACTORS UNDERLYING COOPERATION

To answer when and why humans cooperate, researchers often take a functionalistic approach grounded in the assumption that cooperation is immediately costly to the individual yet is needed for the social organization of the collective (De Dreu et al. 2020, Rand & Nowak 2013, Van Lange et al. 2013). Some reasons for cooperation are acquired through socialization (Thielmann et al. 2020) or triggered by situational circumstances such as the counterpart's sanctioning ability (e.g., Baldassarri & Grossman 2011, Engelmann et al. 2019b, Molenmaker et al. 2016) and the counterpart's facial cues or emotion statements (Bonnefon et al. 2013, Kret et al. 2015, Prochazkova et al. 2018, Van Leeuwen et al. 2018). Other mechanisms may have evolved over time as a function of natural and/or cultural selection (Hare 2017, Kurzban et al. 2015). For example, throughout much of human history, people have lived in stable groups in which they had to depend on each other for the cooperative provision of public goods such as collective security, food production, and health care. Because cooperation paid off in terms of survival and reproductive success, biological dispositions and cultural institutions that favor cooperation over noncooperation may have been selected for at the level of groups (Hare 2017, Tomasello & Vaish 2013).

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Table 1 Manifestations of prosocial preferences, selfish preferences, and (non)cooperative beliefs in common experimental games

Games	Prosocial preferences	Selfish preferences	(Non)Cooperative beliefs
Dictator games	Donate	Keep	NA
Public good/Resource games	Contribute/Not harvest	Free-ride/Harvest	Others will (not) contribute
Contest games	Withhold investment	Invest	Others will (not) withhold investment
Ultimatum bargaining games (proposers)	Offer above other's RP[a]	Offer at other's RP[a]	Other accepts offers at RP[a]
Ultimatum bargaining games (responders)	Accept any offer	Accept any offer	NA
Trust games (investors)	Transfer	(No) Transfer	Trustee will (not) back-transfer
Trust games (trustees)	Back-transfer	No back-transfer	NA
Second- and third-party sanctioning[b]	Punish noncooperation Reward cooperation	Not punish Not reward	(Malicious) Benign intentions (Malicious) Benign intentions

Abbreviations: NA, not available; RP, reservation price.

[a]The reservation price is also referred to as willingness to accept, least acceptable offer, or pain threshold.

[b]Second-party sanctioning is often added to any of the standard games played in repeated format.

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Whether originating in the distant past or in the here-and-now, many factors underlying cooperation can be understood in terms of goal-expectation theory (Pruitt & Kimmel 1977). The theory conjectures that cooperation emerges when two conditions are met. First, participants should have cooperative goals, or prosocial preferences (see the sidebar titled Revealing Social Preferences Through Dictator Games). Second, participants should have cooperative beliefs, in that they need to trust interdependent others to make cooperative decisions. **Table 1** summarizes how selfish and prosocial preferences and beliefs manifest in the archetypical games discussed in the previous section. Importantly, cooperation in dictator and public good provision games can be unambiguously interpreted as reflective of prosocial (rather than selfish) preferences; in other games, such as ultimatum bargaining and trust games, cooperative behavior may reflect either prosocial or selfish preferences. For example, in ultimatum bargaining games proposers may offer the recipient an equal share of the pie not only because they care for the recipient but also because they fear that if they offered less than half the recipient would reject their offer, leaving them empty-handed. Similarly, in trust games trustors may choose to invest not only because they care for the outcomes of the trustee but also because they expect a high return that will benefit them.

REVEALING SOCIAL PREFERENCES THROUGH DICTATOR GAMES

In the dictator game, an allocator unilaterally decides on the distribution of a resource between oneself and a recipient. Allocator decision making is not constrained by strategic considerations such as fear that low offers will be rejected (as, e.g., in ultimatum bargaining) or recipients will fail to reciprocate (as, e.g., in trust games). Because the recipient has no option other than to accept the decision, dictator games are well suited to reveal the allocator's true social preference. In some variants, such as triple dominance games and the slider measure, allocators choose between a fixed set of possible distributions that are manipulated such that choice reveals a particular social value orientation, like a preference for profit maximization, relative gain (winning), or collective efficiency.

Social Preferences

Social preferences differ between individuals. Individuals with a more prosocial value orientation are consistently inclined to value fairness, collective welfare, and another individual's outcomes (Van Lange et al. 2013). Recent work also identified individual differences in antisociality, with some individuals consistently valuing winning at a cost to others (Hilbig et al. 2014, Moshagen et al. 2018). A recent meta-analysis revealed strong positive linkages between prosocial preferences and cooperation in experimental games as well as strong negative linkages between cooperation and individual differences in envy proneness, greed, psychopathy, and Machiavellianism (Thielmann et al. 2020). These linkages may be subject to situational characteristics and incentives. For example, whether prosocial preferences translate into cooperative choices depends on the expected and revealed choices by interaction partners (Aksoy & Weesie 2012, Bault et al. 2017) or the specific type of social dilemma (Van Dijk et al. 2009). In contest games, prosocial preferences lower aggressive exploitation of others but not protection against such exploitation (De Dreu et al. 2019), and people with antisocial personality exploit others' trust unless there is a threat of punishment (Engelmann et al. 2019b, Hilbig et al. 2014).

Recent work has started to identify the neural correlates of social preferences. A pioneering study by Sanfey and colleagues (2003) on ultimatum bargaining showed that unfair offers elicited activity in the anterior insula and the dorsolateral prefrontal cortex, suggesting that both emotions (coded in the insula) and cognitive control (coded in the prefrontal cortex) modulate concerns for fairness and others' outcomes (see also Corradi-Dell'Acqua et al. 2013, Stallen et al. 2018). This indicates that social preferences, including fairness concerns and consideration of others' welfare, may be grounded in both strategic deliberation and more intuitive, emotional processing. Other studies revealed that stronger deviation from an individual's preferred self–other allocation positively correlated with neural activity in the amygdala, a neural structure involved in threat detection and emotion processing (e.g., Liu et al. 2019). Possibly, deviations from fairness are emotionally more aversive to individuals with prosocial as opposed to selfish preferences.

Beliefs

Decisions to cooperate may reveal social preferences but also expectations, or beliefs, about the interdependent others' cooperativeness (see also **Table 1**). In trust games, how much to transfer to one's receiver depends on beliefs about the receiver's trustworthiness (i.e., about whether and how much the receiver will back-transfer). In ultimatum bargaining games, how much to offer one's responder depends on beliefs about the recipient's reservation price (i.e., the lowest amount that is still acceptable). And in public good provision games, the decision to cooperate depends on beliefs about others' propensity to cooperate or free-ride instead (Fehr & Gächter 2000).

When decisions are made simultaneously, as in standard public good provision and contest games, participants need to base their choices on some assumption or estimation of what others will do. When considering whether to cooperate or not, participants may, for example, start from the assumption that the other players have no preferences and decide randomly between cooperation and noncooperation. They may, however, also reason that the other players will expect them to follow this assumption and may incorporate this to come up with an alternative strategy. In short, beliefs about others may be grounded in more or less sophisticated cognitive reasoning of the "I think that you think that I think" kind, ad infinitum (Camerer et al. 2015, Crawford 2019, Mauersberger & Nagel 2018). Cognitive ability and temporary constraints on reasoning capacities may then moderate belief formation and updating, as several studies have shown (e.g., Lee & Seo 2016, Spiliopoulos et al. 2018).

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Table 2 Manifestations of (in)direct reciprocity in common experimental games played in repeated format

Games	Direct reciprocity[a]	Partner control[b]	Partner selection[c]
Dictator games	NA	NA	NA
Public good/Resource games	Match contribution or harvest	Sanction mismatching contributions[d] or harvests/Gossip	Include cooperators/Exclude free-riders
Contest games	Match other's investment	Sanction mismatching investments/Gossip	Include weak contestants/Exclude strong contestants
Ultimatum bargaining games	Accept (reject) offers above RP[e]	Sanction offers above RP/Gossip	Include (exclude) proposers offering at or above (below) RP/ Include (exclude) recipients with low (high) RP
Trust games	Proportional back-transfer[f]	Sanction disproportional (back-)transfer/Gossip	Include proportional and generous investors and responders

Abbreviations: NA, not available; RP, reservation price.
[a]This assumes direct reciprocity of either observed or expected behavior in two-player versions of the experimental game.
[b]Partner control can be second- or third-party (for direct or indirect reciprocity, respectively).
[c]Partner selection can be second- or third-party (for direct or indirect reciprocity, respectively).
[d]Sanctions can involve costly punishment, costly reward, or both.
[e]The RP is also referred to as willingness to accept, least acceptable offer, or pain threshold.
[f]Proportionality in back-transfers is one of several rules for reciprocating in trust games; another rule would be to return half of the multiplied investment.

When decisions are made sequentially, decision makers need to form beliefs about what others will do given their own strategic choices. In the absence of information, beliefs may be based on heuristic cues and social norms. For example, in one-shot ultimatum games, people believe, correctly, that many recipients reject unfair offers (Debove et al. 2016). A fair equal split of the resource is a relatively safe bet in the absence of further information about others' reservation price. Offering an equal split may then reflect a strategic motivation aimed to secure personal reward rather than a true taste for fairness (see also **Table 2**). Decision makers may also condition their beliefs on more or less diagnostic partner characteristics, including the partners' emotional states. For example, Kausel & Connolly (2014) showed that beliefs about partner trustworthiness are conditional upon the partner's (perceived) emotional state. In a trust game, investors learned that their partner had written about an incident that made them feel angry, guilty, grateful, or neutral. Investors anticipated that especially partners that were made to feel angry would be less trustworthy. Taking this into account, they trusted angry partners less. Other work showed that such emotion signals can be quite subtle. Several experiments using ultimatum bargaining and trust games showed, for example, that facial features (Bonnefon et al. 2013, Geniole et al. 2019, Van Leeuwen et al. 2018), including even the partner's pupil size (Kret et al. 2015, Prochazkova et al. 2018), modulate perceived partners' trustworthiness and investments.

Recent studies have asked how beliefs are encoded and updated in the brain. Some studies examined neural structures involved in mentalizing and perspective taking, such as the precuneus, superior temporal sulcus, temporoparietal junction, and medial prefrontal cortex (Schaafsma et al. 2015). This work revealed that positive (versus negative) emotion displays by one's partner activated this mentalizing neural network, which mediated trust and cooperation (Engelmann et al. 2019a, Prochazkova et al. 2018). Other studies focused on neural activity when beliefs are violated, for example, when partners fail to reciprocate. Prediction errors were associated with

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enhanced neural activity in emotion-processing areas such as the amygdala and anterior insula (e.g., Engelmann et al. 2019a), executive control areas such as the dorsolateral prefrontal cortex (King-Casas et al. 2005), and value computation areas such as the ventral striatum (Rojek-Giffin et al. 2020). Possibly, belief violations are emotionally aversive but are also processed in terms of their strategic consequences.

Direct and Indirect Reciprocity

Prosocial preferences and beliefs about others' trustworthiness enable individuals to solve the problem of cooperation in one-shot interactions, when parties have neither a history nor a future. In repeated interactions, individuals can solve the problem of cooperation also through (in)direct reciprocity (Axelrod & Hamilton 1981). The mechanism of (in)direct reciprocity does not require (assumptions about) social preferences and cooperative beliefs and thus provides an important complement to Pruitt & Kimmel's (1977) original goal-expectation framework.

Table 2 lists how the principle of direct reciprocity translates in behavioral choice in common experimental games with repeated play. Through direct reciprocity, individuals develop an exchange that in the longer run benefits each partner more than a cycle of mutual noncooperation would do (Axelrod & Hamilton 1981). Some tolerance for mistakes is required, however. For example, when participants learn that there is a probability that others' decisions will be randomly determined, direct reciprocity cannot be used as decision heuristic, and cooperation can break down (Cushman et al. 2009, Klapwijk & Van Lange 2009).

Direct reciprocity cannot explain why people donate to others who cannot directly return the favor, as in two-player games with random-partner matching and dictator games (Engel 2011) and in *N*-person public good provision games with repeated play. Such behavior can, however, be explained on the basis of indirect reciprocity. This mechanism rests on partner control, or the individual's ability to change partner behavior by punishing noncooperation and rewarding cooperation, and partner selection, or the ability to (de)select a partner for future interactions. Both partner control and partner selection rest on reputations, that is, how much one cooperated in past interactions and how much one was willing and able to sanction (non)cooperation. People may cooperate more with someone known to sanction noncooperation (Rand et al. 2009) and engage in second-party punishment and reward of others' (non)cooperative behavior (e.g., Baldassarri & Grossman 2011; for a review, see Balliet et al. 2011). People are also more likely to select partners known to be cooperative rather than noncooperative in past interactions (Barclay 2016, Gross & De Dreu 2019b, Martin & Cushman 2015). **Table 2** lists, for each of the archetypical games discussed in the section titled Games for Mixed-Motive Decision Making, how partner control and partner selection manifest in behavioral choice.

Indirect reciprocity has been observed also in third-party decision making. Results show that uninvolved people typically reward others' cooperation and punish noncooperation, and that such third-party sanctioning can promote cooperation. However, third parties are more likely to punish when they can conceal their identity (Rockenbach & Milinski 2011) and when they operate in groups rather than individually (Molenmaker et al. 2016). They also prefer others to do the punishing for them (e.g., they use a "gun for hire"; see Andreoni & Gee 2012). One reason is that allocating punishments begets third parties a negative reputation (Eriksson et al. 2016), and punishing noncooperators may backfire and elicit counter-punishment from punished group members (Fehl et al. 2012, Gross & De Dreu 2019a, Herrmann et al. 2008). Accordingly, third parties promote indirect reciprocity often through costly reward of cooperators and compensation of victims of exploitation (De Kwaadsteniet et al. 2019, Stallen et al. 2018).

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Indirect reciprocity is managed not only through explicit reward and punishment but also more implicitly through gossip—i.e., by informing others about someone's past cooperative or unfair behavior (Sommerfeld et al. 2007). Gossip facilitates the spreading of (negative) reputations, which may prohibit people from selfish keeping in dictator games (Piazza & Bering 2008), from free-riding during public good provision (e.g., Feinberg et al. 2014), and from not reciprocating in trust games (Fonseca & Peters 2018). Gossip can thus promote trustworthiness and cooperation because it reveals descriptive information about what people did and because it provides normative information about what is deemed (in)appropriate behavior (Shank et al. 2019).

FACTORS UNDERLYING COORDINATION

Social preferences, beliefs, and (in)direct reciprocity are key factors underlying cooperation and may help decision makers to solve problems of coordination. For example, prosocial preferences lead proposers in ultimatum games to offer more generously, thus increasing the likelihood that their recipients will accept the offer. Yet coordination benefits from three additional factors: communication, sequential decision making and leadership, and focal points and prominent solutions.

Communication

Communication among group members is often seen as a pathway to cooperation because it increases pressures to comply with a group norm of cooperation, and it induces group members to commit themselves to cooperate (Crawford 2019, Fehr & Schurtenberger 2018, Mauersberger & Nagel 2018). The beneficial effects of gossip described above fit with this notion. An additional benefit of communication, however, is that it helps people to coordinate their actions (He et al. 2019). For example, communication can be helpful in identifying how much each member should contribute in step-level public good games in which some but not all effort potentially available in the group is needed to provide the public good (De Kwaadsteniet & Van Dijk 2012).

Communication can be subtle and does not need to involve verbal statements. Indeed, even communicating emotions can promote coordination. For example, in ultimatum bargaining games, recipients' communication of anger may be taken as a signal that low offers will be rejected and thereby extract higher offers from the allocators (Van Dijk et al. 2018). In contrast, displays of guilt may be perceived as a signal of future cooperation and thereby promote coordination and trust (De Melo et al. 2014, Shore & Parkinson 2018). However, the problem with communication as a means to coordinate decision making is that participants should be convinced that they can rely on each other's honest transmission of information (Schelling 1960). Communication may not provide such certainty (e.g., it could be "cheap talk"; see He et al. 2019). In trust games, for example, the beneficial effects of communicated emotions depend on the extent to which signals are deemed credible (e.g., Shore & Parkinson 2018).

That communication may be deceptive has been shown repeatedly in sender–receiver games in which senders have the power to (mis)inform and strategically maneuver their interdependent receivers' choices (Ellingsen et al. 2018, He et al. 2019). This effect has also been shown in trust games, where selfish responders promise cooperation in order to secure a generous offer from their investors and then do not reciprocate, and in ultimatum bargaining games, where recipients try to invite high(er) offers by signaling an excessively high reservation price (Besancenot et al. 2013) or exaggerate their anger and/or disappointment over low offers (Van Dijk et al. 2018).

Sequential Decision Making and Leadership

A second factor underlying coordination involves making decisions sequentially rather than simultaneously. For example, in a special case of the step-level public good game, the volunteer's

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dilemma, a group's success is already secured if one of its members volunteers to contribute; any additional contribution is no longer needed. To facilitate coordination of who contributes and who does not contribute, sequential play can be introduced in which one participant first announces their decision, then the second announces theirs, and so on (Diekmann & Przepiorka 2016; for extensions in step-level public good provision see, e.g., Normann & Rau 2015).

As a related mechanism for coordination, participants may also defer to a group leader (Cappelen et al. 2016, Gächter & Renner 2018). Gächter & Renner (2018) studied this in a repeated experimental public good game with and without a leader who makes a contribution to the public good before others (the followers). Their results show that leaders strongly shape their followers' initial beliefs and contributions, especially in early rounds of the game.

Focal Points and Prominent Solutions

In the absence of communication and leading by example, participants resort to tacit coordination around so-called focal points and prominent solutions (Schelling 1960). Examples of focal points and prominent solutions in mixed-motive decision making are the collectively efficient solution (Halevy & Chou 2014) and a fair 50/50 split in bargaining and negotiation (Carnevale & Pruitt 1992, Debove et al. 2016). Finally, and similar to leadership, social status cues can serve as a focal point used to coordinate mixed-motive decision making. For example, De Kwaadsteniet & Van Dijk (2012) showed that low-status individuals were inclined to defer to the preferences of high-status individuals, and this facilitated coordination.

Tacit coordination requires participants to think through what interdependent others will do and to adapt their own decisions to these predictions. This becomes more complex when multiple focal points exist that require different decisions—e.g., a fair split leads to different decisions than deferring to a high-status participant. In such cases, participants need to engage in reasoning of the "I think that you think that I think" kind, ad infinitum (see Mauersberger & Nagel 2018 for a review on *k*-level reasoning and cognitive hierarchies in coordination games) (see also the section titled Beliefs). *k*-level reasoning helps coordination especially in repeated games, where it enables participants to learn from prediction errors and to update their expectations about what interdependent others will do (e.g., Coricelli & Nagel 2009, De Freitas et al. 2019).

EMERGING TRENDS AND OPEN QUESTIONS

The previous sections emphasized what can be considered the main themes and findings in the empirical study of experimental games. Specifics aside, there is by now robust evidence that (the neurobiological correlates of) social preferences and beliefs, reputation and (in)direct reciprocity, and communication and focal points underlie mixed-motive decision making. The evidence provides a solid basis for new work that extends the use of experimental games to study differences within groups, between groups, and between cultures. Parallel to these trends, there are developments in cognitive and affective neuroscience and computational modeling and in agent-based simulations that pave a new way of using experimental games.

Cooperation Among Unequals

Much of the research literature on cooperation and coordination assumed that participants are interchangeable, in the sense that all have the same ability to contribute to the public good, that their contributions are equally productive, and that all experience the same consequences when the public good is, or is not, established. Increasingly, studies have started to address these simplifying

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assumptions. Hauser et al. (2019), for example, showed that when participants' endowments and productivities are independently manipulated, overall welfare is maximized when the two sources of heterogeneity are aligned, such that more productive individuals contribute more only when they are wealthier than their counterpart.

Efficiency: the solution, or combination of participants' strategic choices, that gives the highest outcome at the level of the collective

A related line of work introduced the so-called social dilemma of self-reliance, in which group members facing a collective problem can solve the problem through public good provision (e.g., publicly available health care or national security) or, alternatively, by investing in a private solution (e.g., private health insurance or private security). Although the private solution is costlier, it avoids the risk of free-riding and cooperation failure. Initial findings show that when self-reliance is possible, group members invest more often in their private solution than in the public good (Gross & De Dreu 2019a), and that within-group differences in self-reliance increase wealth disparities and undermine group cohesion (Gross et al. 2020). One reason for these effects is that differences in productivity, wealth, and self-reliance often come with differences in power—the ability to control others' choice behavior (Van Dijk et al. 2019)—that change both fairness perceptions and exploitative tendencies (Malluci et al. 2019, Tost & Johnson 2019).

Differences between individuals may also be unrelated to ability, self-reliance, and power and yet still have an impact on group cooperation and coordination. Human groups are notably diverse in that members differ in demographic and cultural backgrounds or hold contrasting ideological orientations. When members of a group are both male and female, come from two distinct cultural or ethnic backgrounds, or adhere to two contrasting ideologies, heterogeneity may create fault lines between distinctly different yet internally homogenous factions (Winter & Zhang 2014). Fault lines may threaten group cooperation and coordination because people trust dissimilar others less than similar others and expect dissimilar others to cooperate less (Mussweiler & Ockenfels 2013, Romano et al. 2017). More work on fault lines is needed, however, as research evidence is mixed. For example, several lab-in-the-field experiments in India (Keuschnigg & Schikora 2014) and Tanzania (Gehrig et al. 2019) showed no differences in public good provision and preservation between groups composed of members from the same ethnic community and groups composed of members from two ethno-politically distinct communities.

Intergroup Polarization and Competition

Experimental games are also used to understand intergroup polarization and competition. Traditionally, researchers used (variants of) the archetypical games shown in **Figure 1** and examined decision making when partners were from the same group or social category or from different, more or less rivaling, groups. Large-scale meta-analysis of this type of work revealed an in-group bias in cooperation, with more cooperative choices toward in-group members than toward out-group members (and strangers; see Balliet et al. 2014, Lane 2016).

One possible explanation for these findings is that people have more prosocial preferences toward, and hold more benign beliefs about, in-group than out-group members, and that norms of (in)direct reciprocity more readily develop within rather than between groups (Balliet et al. 2014, Romano et al. 2017). Initial evidence for this possibility comes from studies using so-called two-level games, in which individuals are nested in groups that are, in turn, nested in intergroup systems (Bornstein 2003). Examples of such two-level games include the nested social dilemma (Aaldering et al. 2018), the intergroup prisoner's dilemma–maximizing differences game (Halevy et al. 2012), and intergroup contest games (e.g., Abbink et al. 2010) (**Figure 2**). Across these games, individuals face a choice between selfish keeping (e.g., free-riding), contributing to in-group efficiency (parochial cooperation), contributing to collective efficiency (universal cooperation), and contributing to intergroup competition. Typically, this research shows, first, that parochial

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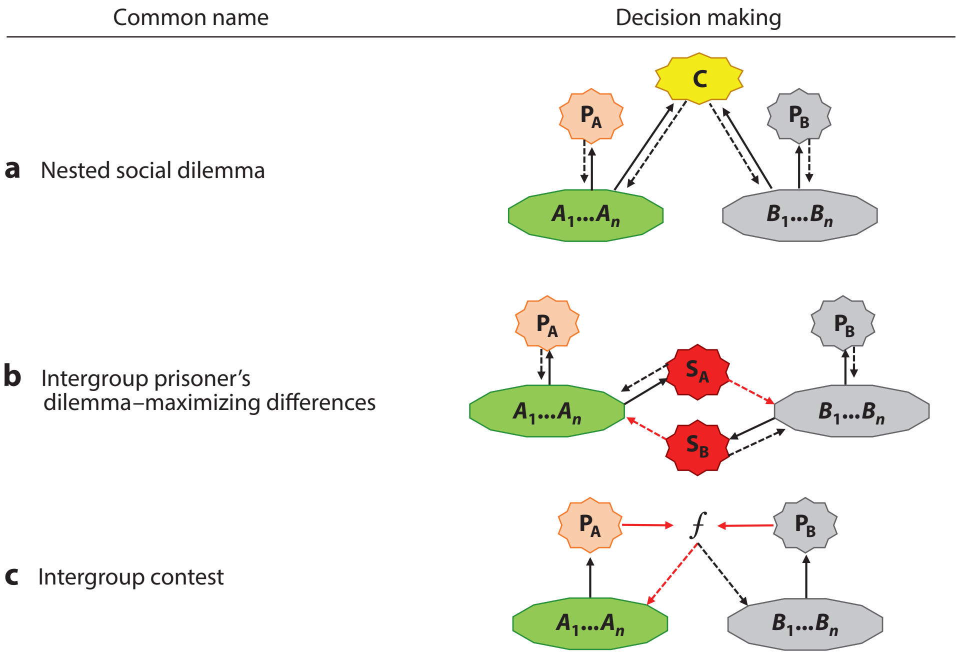

Figure 2

Two-level intergroup games in which individuals are nested in groups A and B that are, in turn, nested in an overarching collective. Individuals have an endowment from which they can make contributions; contributions (*solid arrows*) are non-recoverable, and what is not contributed is for the individual to keep. Returns provide a benefit (*black dashed arrows*) or cost (*red dashed arrows*) to the individual's earning. (*a*) In nested social dilemmas, individuals can contribute to their in-group public good P (parochial cooperation) and to a collective public good C (universal cooperation). Parochial cooperation benefits in-group members, and universal cooperation benefits both in-group and out-group members (using for each the rules of the standard public good provision game). (*b*) In an intergroup prisoner's dilemma–maximizing differences game, individuals can contribute to their in-group public good P (parochial cooperation) and to a between-group public good S (intergroup competition). Contributions to P and S benefit in-group members in the same way (along the rules of the standard public good provision game), but contributions to S additionally impose a cost on out-group members. (*c*) In an intergroup contest, individuals can contribute to their in-group's ability to compete against another group to obtain (avoid) a group reward (punishment). The contest success function *f* sets the conditions for winning the contest (e.g., the group with the highest overall contributions wins) and its consequences for all contestants (e.g., whether winners earn the losers' non-invested resources and how the reward is distributed across victorious group members). Figure adapted with permission from De Dreu et al. (2020).

cooperation exceeds universal cooperation even when universal cooperation is more efficient (e.g., Aaldering et al. 2018, Halevy et al. 2012, Israel et al. 2012). Second, parochial cooperation exceeds contributions to intergroup competition (e.g., Halevy et al. 2012, Schweda et al. 2019, Weisel & Böhm 2015), and contributions to intergroup competition are more substantial when they protect the in-group against the out-group threat than when they enable the in-group to exploit rivaling out-groups (Böhm et al. 2016, De Dreu et al. 2016).

Recent work has used decision making in two-level games to identify the neurobiological correlates of parochial cooperation on the one hand and of intergroup competition and out-group spite on the other (e.g., Cikara & Van Bavel 2014, De Dreu et al. 2010, Han et al. 2020, McClung et al. 2018, Schweda et al. 2019, Yang et al. 2020). Other studies are examining how group-level

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institutions, such as sanction systems and leadership, impact the interplay between parochial cooperation and between-group polarization and conflict. This emerging work shows that peer punishment not only promotes within-group public good provision but is also a mechanism for escalating intergroup conflict (Abbink et al. 2010). Group leaders can, however, promote the coordination of collective action and, hence, increase the in-group's likelihood of winning intergroup conflicts (De Dreu et al. 2016, Gavrilets & Fortunato 2014). Leading one's group to victory in intergroup conflict can increase personal wealth (Doğan et al. 2018) and serves as impetus for status conferral and re-election (Halevy et al. 2012). An emerging insight from these lines of work is that core mechanisms for cooperation and coordination within groups, such as social preferences and indirect reciprocity, can escalate wasteful conflict between groups (De Dreu et al. 2020).

Societal and Cross-Cultural Differences

Henrich et al. (2010b) criticized the behavioral sciences for overreliance on research participants from Western, educated, industrialized, rich, and democratic (WEIRD) societies. The problem they highlighted is that research evidence, including results from cooperation and coordination in experimental games, may have limited generalizability. A survey of recent meta-analyses of social decision making underscores the biased sampling. In Balliet et al.'s (2014) study, which found more cooperation with in-group than out-group members, 154 of the 198 effect sizes (78%) were from WEIRD societies and 30 (15%) were from Japan and China. In Balliet & Van Lange's (2013) research, which found that punishment of free-riding more strongly promotes cooperation in societies with high rather than low trust, no less than 70 of the 79 effect sizes (89%) were from WEIRD societies. Although not always reported, similar bias may be present in other meta-analyses, including those on the linkages between cooperation and individual differences in social preferences (e.g., Thielmann et al. 2020).

The bias towards WEIRD samples may be nontrivial, as substantial cross-country and cultural differences exist in how individuals cooperate and coordinate in mixed-motive games. For example, Herrmann et al. (2008) studied peer punishment in public good games across 16 societies (e.g., United States, South Korea, Turkey) and discovered that some non-Western cultures had high prevalence of antisocial punishment—punishing individuals for being (too) cooperative. Henrich et al. (2010a) conducted cross-cultural research in 15 societies (e.g., United States, Ghana, Kenya), finding less concern for fairness or for punishing unfairness in cultures that are not dominated by major world religions and lack market integration (operationalized as the percentage of household spending on purchases from the market as opposed to homegrown, hunted, or fished resources) (also see Debove et al. 2016, Xie et al. 2017). When Lang and colleagues (2019) studied dictator giving in small-scale societies practicing Buddhism, Christianity, and Hinduism, but also forms of animism and ancestor worship, they found higher ratings of gods as monitoring and punishing to be related to increased sharing of resources with distant coreligionists (for similar results with volunteer dilemmas, see Olivola et al. 2020). Perhaps beliefs in monitoring and punitive gods help expand the circle of sustainable social interaction and facilitate cooperative behavior toward out-groups.

A tentative conclusion emerging from these and related studies is that decision making in experimental games can also reveal the impact of local institutions, including formal rule of law and informal norms for cooperation and antisociality (Enke 2019). Some of the main functions of institutions are to help individuals navigate mixed-motive interdependencies and to heuristically solve the problem of cooperation and coordination. The extent to which institutions do so effectively may create collectively efficient decision making and further support for such institutions.

Possibly, the specific form institutions take may matter less than their functionality for helping decision makers' problems of cooperation and coordination. Experimental games offer a useful tool to examine these and related possibilities.

Neurocomputational Mechanisms for (Updating) Preferences and Beliefs

In experimental games with repeated play, preferences and beliefs change as a function of the interaction, the implementation of (second- or third-party) sanctions, and partner selection. When trust is betrayed, for example, participants need to update their beliefs about the interdependent other's trustworthiness. When an ultimatum is rejected, participants need to change their beliefs about the responder's reservation price. And when an angry person cooperates, perceivers may need to conclude that anger does not always come with aggression or, alternatively, that some Machiavellian trick is being played.

Research is beginning to unravel how preferences and beliefs are formed and shaped in the course of interactive decision making. Some work uses computational modeling approaches. Participants are assumed to learn from rewards (e.g., when others reciprocate one's cooperation) and punishments (e.g., when others punish one's free-riding) and to be motivated to minimize prediction errors—that is, the deviation between expected rewards and punishments and those that are actually received. Reinforcement learning and Bayesian updating models are fitted to decision making in experimental games, with the best-fitting model providing a mechanistic account of whether and how participants change their social preferences and update their beliefs (e.g., FeldmanHall et al. 2018, Fontanesi et al. 2019; see also Camerer et al. 2015, Mauersberger & Nagel 2018).

Computational modeling of decision making in experimental games has been fruitfully combined with process-tracing, neuroimaging, and neuromodulator technology. Using eye-tracking technology, Fiedler and colleagues (2013) found that social preferences associate with differential attention to and processing of personal and collective welfare consequences from decision making, suggesting that social preferences modulate how individuals learn and update during interactive decision making. In the section titled Social Preferences, we reviewed studies suggesting that cooperative choice, generosity, and trust recruit and depend on activity in prefrontal regions involved in executive control, as well as subcortical regions involved in value computation, perspective taking, and emotion processing. These brain regions have been linked also to key parameters from computational models of (updating) social preferences and beliefs, including prediction errors for reward and risk that are imminent in social decision making (for examples, see Apps & Ramnani 2017, Lockwood et al. 2016, Park et al. 2019, Rojek-Giffin et al. 2020, Wittmann et al. 2016). A neurocomputational approach may be fruitfully used also to better understand how hormones such as oxytocin, vasopressin, and testosterone influence strategic choice in mixed-motive interdependency (e.g., Chen et al. 2017, Gabay et al. 2019).

Agent-Based Simulations

Evolutionary theory conjectures that the human capacity to cooperate with genetically unrelated others may be the outcome of natural and cultural selection (Hare 2017, Kurzban et al. 2015, Tomasello & Vaish 2013). The timescales and population sizes at which biological and cultural evolution takes place cannot be meaningfully recreated in experimental laboratories, and the complex interplays between social preferences, cooperative beliefs, and possibilities for (in)direct reciprocity escape analytical (mathematical) solutions. To address this limitation, research increasingly engages with (evolutionary) agent-based simulations (Adami et al. 2016, Perc et al. 2017).

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AGENT-BASED SIMULATION

In agent-based simulations, computer agents are programmed to play certain strategies at certain probabilities when they are paired to another agent in, for example, prisoner's dilemmas or ultimatum bargaining games. Agent-based simulation often defines outcomes as the agents' reproductive fitness, operationalized as the number of new agents of the same type that spread into the population. Simulations can manipulate, for example, which strategy profiles are paired and at what probability, the agents' capacity to adapt decisions to their partners' profiles, or the agents' ability for partner control (e.g., punishment) and/or partner selection (e.g., blocking certain strategy profiles from future interaction). Furthermore, random mutations in strategy types and/or nature shocks can be exogenously imposed. Agent-based simulation allows researchers to develop and test theory on cooperation and coordination (*a*) as a combined function of several agent characteristics or traits, such as their strategic preferences, partner control and partner selection; (*b*) across large timescales or generations; and (*c*) in large populations with predefined or emerging network structures. A caveat with agent-based simulations is that small fluctuations in model parameters can have unknown consequences, especially when several parameters are manipulated in combination. Careful and transparent definition is key to avoiding spurious outcomes that obfuscate our understanding of (the development and sustainability of) cooperation and coordination.

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Agent-based simulations (see the sidebar titled Agent-Based Simulation) allow repeated play to mimic evolutionary timescales and to incorporate a larger range of agent strategy profiles than is possible in experiments with human participants (Axelrod & Hamilton 1981). These advantages are being increasingly recognized, and a small but growing literature engages (evolutionary) agent-based simulations to test hypotheses about human cooperation (Gross & De Dreu 2019b, Perry et al. 2018) or to complement laboratory studies on cooperation and coordination in experimental games (Debove et al. 2016, Hauser et al. 2019, Lindstrom et al. 2018, Szekely et al. 2020). Much of this work focuses on natural or cultural selection of behavioral strategies, including partner control through punishment (e.g., Perry et al. 2018, Szekely et al. 2020) and partner selection (Bianchi et al. 2020, Gross & De Dreu 2019b). Our review revealed solid evidence for social preferences, cooperative beliefs, and capacity for reputation-based (in)direct reciprocity as core psychological mechanisms underlying cooperation and coordination. Agent-based simulations offer an exciting tool to identify whether, and to what extent, natural and cultural selection shape not only the ultimate (evolutionary) but also the proximate (psychological) mechanisms underlying cooperation and coordination (Akcay et al. 2009, Aktipis 2011, Bear & Rand 2016).

SUMMARY AND CONCLUSIONS

Experimental games as a tool for analysis and empirical study have a long-standing tradition in psychological science and related disciplines such as experimental economics, sociology, and biology. Recent advances are seen in the development of new games and in variations of existing games that allow for substantial flexibility in identifying when and why cooperation and coordination emerge and break down. With these methodological innovations, researchers have studied repeated interactions in which cooperation can unfold over time and individuals learn to coordinate, and they discovered the critical role of reputation by studying partner control (through second- and third-party punishment and reward) and partner selection. Adding to the classic insight that cooperation and coordination hinge on prosocial preferences and cooperative beliefs, research has documented the neurobiological underpinnings of preferences and beliefs and has added (in)direct reciprocity as a key mechanism for group cooperation and coordinated collective action. These core

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findings provide a solid foundation for several emerging trends we identified, including the study of within-group heterogeneity in wealth and productivities, of how within-group cooperation interacts with intergroup competition, of how cross-cultural differences condition cooperation, and of how preferences and beliefs evolve over time when learning and updating are possible.

Compared with previous treatises on experimental games published in the *Annual Review of Psychology*, one thing in our review certainly stands out: The field has become strongly interdisciplinary. One reason for successful interdisciplinary outreach and cross-fertilization is that the emergence and breakdown of competition and cooperation, and the coordination of joint action, are of concern not only to (social) psychology and economics but also to disciplines like evolutionary biology and animal behavior. Another reason is that game theory and the methodology of context-free experimental games provide for a common language that is independent from specific disciplines. At the same time, important differences between disciplines continue to exist that hinder their rapprochement. For example, the use of deception is restricted but condoned in psychology and the cognitive and affective neurosciences. Deception allows one to study situations of special interest that are unlikely to occur naturally, to maintain experimental control, or to use (neuroscience) methods that cannot be implemented without some form of deception. These reasons notwithstanding, deception is strictly denounced in economics. The argument is that deception compromises the ethical conduct of research and undermines the credibility of research if participants realize they may be fooled. Vice versa, psychological science has a strong tradition of complementing behavioral and neural measures with self-report measures of motivations, emotions, and social perceptions, beliefs included. While sometimes denounced as cheap talk and as uninformative about the actual underlying process, self-report measures of personality and individual differences (e.g., agreeableness, need for cognitive closure) can capture latent constructs in economic theory (e.g., social preferences, uncertainty aversion) and have predictive value for many behaviors, including economic behavior (Ferguson et al. 2019, Hilbig et al. 2014, Moshagen et al. 2018, Thielmann et al. 2020, Van Lange et al. 2013). Indeed, combining personality measures with decision making in experimental games can generate new cross-disciplinary insight (e.g., Engelmann et al. 2019b, Olivola et al. 2020, Thielmann et al. 2020).

Disciplinary idiosyncrasies notwithstanding, experimental games are fruitfully used across the social and behavioral sciences to study basic behavioral group phenomena like cooperation and competition, trust and reciprocity, the building and spreading of reputations and norms, the sanctioning of wrongdoers, and the helping of victims. How people interact within groups is at the core of social psychology. When social psychologists Levine & Moreland (1990, p. 620) reviewed the literature on group dynamics and group performance, they observed that studies of "groups are alive and well, but living elsewhere" (i.e., in organizational sciences rather than in social psychology). When it comes to social decision making and the use of experimental games, we can end with a more optimistic note: The study of cooperation and coordination, including their social psychological mechanisms and consequences, is alive and well not only in economics and decision neuroscience but also in psychology. Indeed, experimental games offer a tool to rigorously study pressing issues of theoretical and societal concern—how humans interactively shape their own and others' future.

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Annual Review of
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Contents

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Indexes

Annu. Rev. Psychol. 2021.72:415-438. Downloaded from www.annualreviews.org
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