From one mind to many: the emerging science of cultural norms

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Cultural norms permeate human existence. They shape our view of reality and the evolution of culture. In this review, we discuss the benefits of a cultural science that studies norms as well as values, and review research on (a) whether cultural norms are distinctly human, (b) when people will follow cultural norms, and (c) what factors shape the content and strength of cultural norms. We argue that studying cultural norms represents a critical cross-disciplinary, multi-level approach that is ideal for both understanding culture and tapping its potential for positive change.

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Social life is profoundly affected by cultural norms, or shared standards for behavior among members of a community [1]. People look to cultural norms when they cooperate [2], conform [3], express prejudice attitudes [4], and drink too much on Friday night [5]. Cultural norms are responsible for both cultural endurance — such as the continued existence of gender typecasting in Hollywood blockbusters [6] — and for cultural change — such as the recent surge in Americans' preferences for unique baby names [7] and increased environmental conscientiousness, as some of the world 'goes green' [8]. In their original theories, scholars differentiated between injunctive norms, which correspond to people should do, and descriptive norms, which refer to what people actually do [9–11]. Yet both fundamentally correspond to intersubjective consensus, or 'common sense' [12,13••], and it is this mutually shared knowledge that systematically guides human decision-making [14–17].

Despite their ubiquity and importance, research in cross-cultural psychology has only recently begun to explore the etiology and function of cultural norms, in part due to the field's almost exclusive focus on cultural values in the past [17–20,21••]. Because norms are represented at both the cultural and individual level, this emerging science of cultural norms engages scholars from numerous disciplines who study people's individual social tendencies and also those that study cultural collectives. In this paper, we survey a broad set of literatures, sampling studies from developmental, social, and cross-cultural psychology — as well as biology, and anthropology — that have sought to answer three summative questions concerning cultural norms: First, are cultural norms distinctly human? Second, what factors influence when people will follow versus deviate from norms? And third, what shapes the content and strength of norms across cultures? As we will argue, studying cultural norms represents a critical cross-disciplinary, multi-level approach that is ideal for not only understanding culture but also tapping its potential for positive change.

Are cultural norms distinctly human?

Humans are not the only species to behave in normative ways. Stickleback fish conform to group foraging decisions [22], and rats follow normative eating patterns when determining whether food is safe or not [23]. Furthermore, a significant body of literature (e.g. [24••,25]) has documented similarities between human and chimpanzee communities, suggesting that chimpanzees share the evolutionary roots that enabled people to follow and enforce cultural norms. Chimpanzees show differences across geographical populations in their foraging [26] and eating behavior [27], and will even focus attention on video scenes that exhibit non-normative aggression [28]. Some scholars note these studies as evidence that chimps, like humans, have the cognitive mechanisms needed for norm construction [29]. However, others argue that humans' tendency to actively seek out and follow intersubjective consensus is unlike any other species, and that this uniqueness underlies the ability of human culture to evolve across generations [30,31]. In explaining this human uniqueness, Göckeritz et al. [32] contend that cognitive proclivities such as language and memory have allowed for humans to transmit cumulative culture unlike any other species.

But aside from documenting language and memory advantages, comparative research increasingly suggests that only humans actively construct cultural norms, showing a highly motivated tendency toward emulating others, even when the tangible payoffs from normative behavior are nebulous [33]. Before they have developed a theory of mind, infants prioritize joint activities over individual ones [34], and toddlers choose collaborative options of gathering food, even when it is less efficient than a solo

option [35]. Haun *et al.* [36] find that humans (but not chimps) alter behavior that had previously been individually rewarded to match a peer's (see also [37] for a review on conformist transmission in children and chimpanzees). Moreover, once children begin to participate in social institutions (e.g., begin schooling), they also show a motivation to *enforce* cultural norms [38]. Preschoolers punish puppets that incorrectly perform a culturally prescribed action [39] or misuse a block of wood that has a culturally prescribed purpose [40], and such punishment is especially severe when transgressors are ingroup members [41].

Social psychologists have similarly affirmed a human motivation to actively construct social norms. Even knowing that one is looking at the same object as someone else facilitates belief in shared goals [42], emotional states [43], and attitudes [44]. Similarly, conversations with close others significantly shape memories of major events like the 9–11 bombings [45], and large social networks will develop increasingly shared memory as a function of selective communication [46**]. It is not surprising then that audience tuning, in which actors will tune their behaviors to be congruent with group norms [47], has been widely documented, and many studies have shown that people often rely on intersubjective consensus to a greater extent than objective information: Whether it is voting for members of an all-star baseball team [48] or judging the quality of an actor [15], we tend to draw from normative information to make decisions. Presumably, it is this active norm construction that has enabled humans to evolve cumulative culture [49], wherein individuals will emulate, interpret, and transmit cultural patterns of behavior and belief.

When will people follow cultural norms?

Humans might be unique in their active construction of cultural norms, but people's normative behavior is critically moderated by social and epistemic factors. Norms are critical for helping individuals coordinate their social action and to achieve favorable evaluations from others and avoid sanctions [17,50]. Accordingly, norm compliance is much higher in contexts where reputational concerns and group identity are salient, such as in public as compared to anonymous conditions [51], when there is mutual knowledge of shared group membership [52], and when individuals are embedded in densely connected networks [50]. Though diverse in their source, these factors all serve to increase *felt accountab*ility [19], where individuals feel subject to monitoring and evaluation. This sense of felt accountability serves as a general norm enforcement mechanism, and influences people's behavior according to dominant cultural values [53,54]. Yamagishi and Suzuki [55], for example, show that Japanese are much more likely to behave in line with their culture's interdependent descriptive norms when they are told that reputational information could be shared with others

(see also [56]). The tendency to tune to the normative expetations of one's audience affects the behavior of biculturals — who use norms in American culture as behavior guides when identifying with Americans and norms common in Chinese culture when identifying with Chinese [16,18]. Children will also show peer conformity to a greater extent when that peer is present [36, Study 2]. Beyond human audiences, research shows that when people are primed with supernatural monitoring, they follow cooperation norms at a greater extent than at baseline [57,58].

Apart from norms' array of social functions, they are also epistemic tools. Humans are meaning-makers who are motivated to resolve ambiguity through simple analytic principles [59**,60]. Norms, which come with epistemic authority and communicative ease, serve as perfect solutions to our need for cognitive closure (NFC; [61]). As such, we appear to rely most on norms when we are in need of this closure. Studies have found that people demonstrate more shared attention and in-group bias when they are primed with uncertainty [18] and have a greater tendency to make culture-conformist decisions after these primes [62]. Livi and colleagues [61] also find that experimentally increasing the need for cognitive closure will lead people to transmit already-held norms from previous generations at a greater rate. NFC even affects the normative audience to which bicultural tune, with those high on NFC increasingly adhering to norms of the culture with whom they are interacting [16,63].

However, despite the general symbolic and pragmatic benefits of cultural norms, not all norms are created equal, and the influence of norms on behavior sometimes extends only as far as their subjective functionality. Kendal *et al.* [64] show that unsuccessful social learning, where socially learned behavior repeatedly has a low payoff, can result in 'anti-conformism' (i.e., a subsequent refusal to follow group norms), and others find conformist decision-making to be less popular in the context of stable environmental conditions and easy tasks [65]. This subjective functionality also includes the extent to which norms help people coordinate with their group and gain social approval, and as such, norm-inconsistent behavior is most likely in contexts of low accountability [53] and among indiviudals who have high power and low dependence on others [66,67], although the latter relationship is significantly weaker amongst members of collectivist cultures [68].

Norms' subjective functionality also depends on people's motivation to simultaneously feel individually distinctive and also identified with a favorable group [69**,70]. Consistent with these claims, individuals tend to abandon a norm after an unpopular group adopts it [71], and people who are motivated to be personally distinct will act in consistently anti-conformist ways (see [72]). It is also

worth noting that classic literature viewed deviance as dysfunctional for a group, and labeled dissent as a marker of group disloyalty and rebellion [73]. However, recent research on dissent comes with a renewed recognition that normative deviance is a normal and healthy expression of group membership, and can be shown out of loyalty. Indeed, many positive deviants remain identified with a reference group, but will deviate out of a moral responsibility to change their group's values and norms ([74]; see [75••] for a review). Together with literature on norm functionality, this research suggests that norm creation and adherence includes both instrumental and symbolic elements. People's identity concerns, the relational context of their decision-making, and their epistemic goals will combine to predict which norms they choose to follow, or if they eschew normative behavior altogether.

What shapes the content and strength of norms across cultures?

Almost a century ago, Malinowski [76] conducted ethnographic fieldwork amongst the Trobriand fisherman, noting a pattern of behavior that would foreshadow much of the contemporary literature on cultural norm functionality. Malinowski noted that norms differed critically across lagoon-fishing and open sea fishing. While lagoon fishing (a reliable practice conducted with minimal effort) featured relatively loose and pragmatic norms, open sea fishing (which was dangerous and uncertain with highly fluctuating payoffs) was marked by magical norms that were ritualistically practiced. This work, alongside the expansive evidence that has amassed since, alludes to the important role of *ecology* in cultural norm formation. Just as the Trobriand fishermen's norms were ecologically customized to facilitate their invaluable work, norms across cultures are continually evolving as a result of environmental challenges [1,77,78].

While the human tendency to socially learn and culturally tune enables social norms to emerge without an ecological basis [79], ecology nevertheless has particular significance for cultural norms. This is not only because humans tend to draw from environmental experience when they construct and adopt norms [80], but also because norms often represent people's coordinated efforts to understand and adapt successfully to their ecology. Empirical research supports the importance of ecology and norm content. Using linguistic analysis, Greenfield [81••] illustrate the emergence of norms for free choice in the United States as people moved to urban areas, while Grossmann and Varnum [7] document the effects of pathogen prevalence and family size (among other variables) on a variety of cultural norms in the USA, including baby-naming trends and divorce. Even instantaneous environmental change can alter descriptive norm content [82,83]. In one series of studies, for example, exposure to a song in a public place shaped personal

attitudes toward that song, a relationship that was moderated by participants' social motivations and mediated by perceived descriptive norms [83].

Just as ecology influences the content of norms, ecological uncertainty and threat influences the *strength* of norms and the tolerance for normative deviance, or what has been termed cultural tightness–looseness [19,84,85,86••]. In a large-scale international study, Gelfand *et al.* [86••] related systematic differences in the strength of norms to cultures' exposure to natural disasters, history of territorial conflict, and population density, among other ecological and human threats. Subsequent agent-based modeling efforts find that the relationship between ecological threat and normative tightness is explained by a need for cultural coordination: cultures with high levels of threat that do not have strong norms and punishment tend to die out [87••]. This hypothesis has been echoed by other cross-cultural research [88,89], and been demonstrated within the USA, using states as the unit of analysis [90]. Moreover, recent research has found that cross-cultural differences in tightness are associated with stronger neurobiological reactions to social norm violations, an effect that also correlates with perceived territorial threat [91••]. The effect of ecological threat on norm strength even appears to have biological consequences, shaping genetic expression [92]. These results suggest that ecological threat may predispose future generations of a culture toward strong norms [87••].

Conclusion and future directions

The literature reviewed here, while sampled largely from the past five years, illustrates a decades of progress in the study of cultural norms. By drawing from cross-disciplinary research, we find that social identity, reputational concerns, and cognitive closure are important ingredients in the human proclivity for normative behavior, and that norms serve an invaluable function in cultural transmission. In this sense, cultural norms have both proximal and distal functions. To individuals, norms are valuable tools for communication and affiliation, but to cultures, norms are a mechanism for adaptation, a means by which cultures can evolve in changing socioecological conditions. This multilevel conceptualization of cultural norms serves as a thread by which cultural scholars can link psychological studies of identity, values, prejudice, and stereotyping with biological and anthropological studies of socioecology and cultural evolution.

As the science of cultural norms advances, it will be important to further our understanding of how cultural and individual processes are linked, and how distal factors affect proximal factors related to the evolution of norm content and strength. We are now in a position to identify whether ecological uncertainty and threat strengthens norms and enables conformist transmission processes through altering cultural participants' need for cognitive

closure and group belonging, and/or selecting for these traits within a culture's institutions (e.g. schools, organizations, religious groups). Conversely, future studies should study whether cultural norms influence genetic makeup through the reproductive fitness of those individuals who have specific genetic dispositions (e.g., DRD4, see Kitayama *et al*. [93], in this special issue). Finally, research should investigate the processes by which norms change (see [94]). Especially in an age of social media, cultural change can occur rapidly overnight, and is usually driven by rapid shifts in intersubjective consensus [94–96]. Future research is needed to understand how ecological (e.g., threat), structural (e.g., characteristics of networks), and individual differences jointly affect the nature and speed of norm change in human groups.

An appreciation of cultural norms is also valuable in applied research. Recent work has demonstrated that the strength of cultural norms has implications for societies' well being, and is even associated with rates of depression and suicide [97••]. Other research has also found that the strength of norms affects macro trends such as stock price synchronicity [98], global creativity [99], and CEO behavior and leadership [100,101]. Moreover, as Wilson and colleagues' [102] work on intentional cultural change argues, the human ability to transmit culture gives us a unique ability to deliberately shape society [103]. And although norm-based interventions are not universally successful [104], they have been shown to reduce bullying in high schools [105••], unhealthy drinking habits [106], and ethnocentrism [107,108], indicating their power as clinical and policy tools. With this potential in mind, our continued study of cultural norms should aim to not only understand cultures, but to enact positive change around the globe.

Acknowledgments

References and recommended reading

Papers of particular interest, published within the period of review, have been highlighted as:

- of special interest
- •• of outstanding interest

1. Chudek M, Henrich J: **Culture–gene coevolution, norm-psychology and the emergence of human prosociality**. *Trends Cogn Sci* 2011, **15**:218-226.

2. Baum WM *et al.*: **Cooperation due to cultural norms, not individual reputation**. *Behav Process* 2012, **91**:90-93.

3. Morgan TJH, Laland KN: **The biological bases of conformity**. *Front Neurosci* 2012, **6**.

4. Crandall CS, Eshleman A, O'Brien L: **Social norms and the expression and suppression of prejudice: the struggle for internalization**. *J Pers Soc Psychol* 2002, **82**:359.

5. Baumgartner SE, Valkenburg PM, Peter J: **The influence of descriptive and injunctive peer norms on adolescents' risky sexual online behavior**. *Cyberpsychol Behav Soc Netw* 2011, **14**:753-758.

6. Eagly AH, Wood W: **Feminism and evolutionary psychology: moving forward**. *Sex Roles* 2013, **69**:549-556.

7. Grossmann I, Varnum ME: **Social structure, infectious diseases, disasters, secularism, and cultural change in America**. *Psychol Sci* 2015. p. 0956797614563765.

8. Smith AM, O'Sullivan T: **Environmentally responsible behaviour in the workplace: an internal social marketing approach**. *J Market Manage* 2012, **28**:469-493.

9. Cialdini RB, Kallgren CA, Reno RR: **A focus theory of normative conduct: a theoretical refinement and reevaluation of the role of norms in human behavior**. *Adv Exp Soc Psychol* 1991, **24**:1-243.

10. Bicchieri C: *The Grammar of Society: The Emergence and Dynamics of Social Norms*. Cambridge University Press; 2006.

11. Berkowitz AD: *The Social Norms Approach: Theory, Research And Annotated Bibliography*. Higher Education Center for Alcohol and Other Drug Abuse and Violence Prevention. US Department of Education; 2004.

12. Eriksson K, Coultas JC: **The advantage of multiple cultural parents in the cultural transmission of stories**. *Evol Hum Behav* 2012, **33**:251-259.

13. Eriksson K, Strimling P, Coultas JC: **Bidirectional associations
•• between descriptive and injunctive norms**. *Org Behav Hum Decis Process* 2014, **129**:59-69.
Eriksson's paper is part of a recent push to critically examine the distinction between injunctive and descriptive norms. In these studies, both sets of norms are frequently conflated in paradigms that use measurement techniques as well as manipulations. The research suggests that norms can be perceived as injunctive, even if they are not enforced.

14. Shteynberg G, Gelfand MJ, Kim K: **Peering into the "Magnum Mysterium" of culture the explanatory power of descriptive norms**. *J Cross-Cult Psychol* 2009, **40**:46-69.

15. Wan C, Tam KP, Chiu CY: **Intersubjective cultural representations predicting behaviour: the case of political culture and voting**. *Asian J Soc Psychol* 2010, **13**:260-273.

16. Zou X *et al.*: **Culture as common sense: perceived consensus versus personal beliefs as mechanisms of cultural influence**. *J Pers Soc Psychol* 2009, **97**:579.

17. Chiu C-Y *et al.*: **Intersubjective culture the role of intersubjective perceptions in cross-cultural research**. *Pers Psychol Sci* 2010, **5**:482-493.

18. Chao MM, Zhang Z-X, Chiu C-y: **Adherence to perceived norms across cultural boundaries: the role of need for cognitive closure and ingroup identification**. *Group Process Intergroup Relat* 2009, **12**:69-89.

19. Gelfand MJ, Nishii LH, Raver JL: **On the nature and importance of cultural tightness–looseness**. *J Appl Psychol* 2006, **91**:1225.

20. Leung K, Morris MW: **Values, schemas, and norms in the culture-behavior nexus: a situated dynamics framework**. *J Int Bus Stud* 2014, **46**:1028-1050.

21. Morris MW *et al.*: **Normology: integrating insights about social
•• norms to understand cultural dynamics**. *Org Beh Hum Decis Process* 2015, **129**:1-13.
This review paper was the introduction to a special issue in Organizational Behavior and Human Decision Processes. The paper, and the entire special issue, provides an excellent window into contemporary research on social norms, featuring many advancements in how social norms are conceptualized and studied.

22. Pike TW, Laland KN: **Conformist learning in nine-spined sticklebacks' foraging decisions**. *Biol Lett* 2010. p. rsbl20091014.

23. Galef BG, Whiskin EE: **'Conformity'in Norway rats?** *Anim Behav* 2008, **75**:2035-2039.

24. Boesch C, Tomasello M: **Chimpanzee and human cultures**.
•• *Curr Anthropol* 1998, **39**:591-614.
This review provides a groundbreaking collaboration in which Tomasello and Boesch outline how cultural norms can be broken down into uniquely human elements and elements that are shared with chimpanzees. This nuanced perspective on cultural norms informs any scholar who seeks to study the origin of human culture.

25. Whiten A, Horner V, De Waal FB: **Conformity to cultural norms of tool use in chimpanzees**. *Nature* 2005, **437**:737-740.

26. van de Waal E, Borgeaud C, Whiten A: **Potent social learning and conformity shape a wild primate's foraging decisions**. *Science* 2013, **340**:483-485.

27. Luncz LV, Mundry R, Boesch C: **Evidence for cultural differences between neighboring chimpanzee communities**. *Curr Biol* 2012, **22**:922-926.

28. von Rohr CR *et al.*: **Chimpanzees' bystander reactions to infanticide**. *Hum Nat* 2015, **26**:143-160.

29. von Rohr CR, Burkart JM, Van Schaik CP: **Evolutionary precursors of social norms in chimpanzees: a new approach**. *Biol Philos* 2011, **26**:1-30.

30. Tomasello M: **The ontogeny of cultural learning**. *Curr Opin Psychol* 2016, **8**.

31. Tomasello M: **Human culture in evolutionary perspective**. *Adv Cult Psychol* 2011, **1**:5-51.

32. Göckeritz S, Schmidt MF, Tomasello M: **Young children's creation and transmission of social norms**. *Cogn Dev* 2014, **30**:81-95.

33. Herrmann PA *et al.*: **Stick to the script: the effect of witnessing multiple actors on children's imitation**. *Cognition* 2013, **129**:536-543.

34. Warneken F, Gräfenhain M, Tomasello M: **Collaborative partner or social tool? New evidence for young children's understanding of joint intentions in collaborative activities**. *Dev Sci* 2012, **15**:54-61.

35. Rekers Y, Haun DB, Tomasello M: **Children, but not chimpanzees, prefer to collaborate**. *Curr Biol* 2011, **21**:1756-1758.

36. Haun DB, Rekers Y, Tomasello M: **Children conform to the behavior of peers; other great apes stick with what they know**. *Psychol Sci* 2014. p. 0956797614553235.

37. Van Leeuwen E, J.C., Haun D: **Conformity in nonhuman primates: fad or fact?** *Evol Hum Behav* 2013, **34**:1-7.

38. Tomasello M, Vaish A: **Origins of human cooperation and morality**. *Ann Rev Psychol* 2013, **64**:231-255.

39. Rakoczy H, Warneken F, Tomasello M: **The sources of normativity: young children's awareness of the normative structure of games**. *Dev Psychol* 2008, **44**:875.

40. Wyman E, Rakoczy H, Tomasello M: **Normativity and context in young children's pretend play**. *Cogn Dev* 2009, **24**:146-155.

41. Schmidt M, Rakoczy H, Tomasello M: **Young children enforce social norms selectively depending on the violator's group affiliation**. *Cognition* 2012, **124**:325-333.

42. Shteynberg G, Galinsky AD: **Implicit coordination: sharing goals with similar others intensifies goal pursuit**. *J Exp Soc Psychol* 2011, **47**:1291-1294.

43. Shteynberg G *et al.*: **Shared attention increases mood infusion**. *J Exp Psychol: Gen* 2014, **143**:123.

44. Shteynberg G: **A social host in the machine? The case of group attention**. *J Appl Res Mem Cogn* 2014, **3**:307-311.

45. Coman A, Manier D, Hirst W: **Forgetting the unforgettable through conversation socially shared retrieval-induced forgetting of September 11 memories**. *Psychol Sci* 2009, **20**:627-633.

46. Coman A, Hirst W: **Cognition through a social network: the**
•• **propagation of induced forgetting and practice effects**. *J Exp Psychol: Gen* 2012, **141**:321.
Coman and Hirst's research on shared memory serves as an excellent example of how unique experimental paradigms can investigate the conditions of cultural construction amongst networks of anonymous participants. This particular study was run using interlinked mechanical turk workers.

47. Echterhoff G, Higgins ET, Groll S: **Audience-tuning effects on memory: the role of shared reality**. *J Pers Soc Psychol* 2005, **89**:257.

48. Fast NJ, Heath C, Wu G: **Common ground and cultural prominence how conversation reinforces culture**. *Psychol Sci* 2009, **20**:904-911.

49. Tennie C, Call J, Tomasello M: **Ratcheting up the ratchet: on the evolution of cumulative culture**. *Philos Trans Roy Soc B: Biol Sci* 2009, **364**:2405-2415.

50. Gelfand MJ, Harrington JR: **The motivational force of descriptive norms: for whom and when are descriptive norms most predictive of behavior**. *J Cross-Cultural Psychol* 2015, **46**:1273-1278.

51. Yamagishi T, Hashimoto H, Schug J: **Preferences versus strategies as explanations for culture-specific behavior**. *Psychol Sci* 2008, **19**:579-584.

52. Yamagishi T, Mifune N: **Does shared group membership promote altruism? Fear, greed, and reputation**. *Ration Soc* 2008, **20**:5-30.

53. Gelfand MJ, Realo A: **Individualism-collectivism and accountability in intergroup negotiations, Journal of**. *Appl Psychol* 1999, **84**:721.

54. Liu W, Friedman R, Hong Y-Y: **Culture and accountability in negotiation: recognizing the importance of in-group relations**. *Org Behav Hum Dec Process* 2012, **117**:221-234.

55. Yamagishi T, Suzuki N: **An institutional approach to culture**. *Evol Cult Hum Mind* 2009:185-203.

56. Chen J, Chiu C-y, Chan SF: **The cultural effects of job mobility and the belief in a fixed world: evidence from performance forecast**. *J Pers Soc Psychol* 2009, **97**:851.

57. Gervais WM, Norenzayan A: **Like a camera in the sky? Thinking about God increases public self-awareness and socially desirable responding**. *J Exp Soc Psychol* 2012, **48**:298-302.

58. Shariff AF, Norenzayan A: **God is watching you priming God concepts increases prosocial behavior in an anonymous economic game**. *Psychol Sci* 2007, **18**:803-809.

59. Kashima Y: **Meaning, grounding, and the construction of social**
•• **reality**. *Asian J Soc Psychol* 2014, **17**:81-95.
In this paper, Kashima summarizes his work on cultural dynamics and the construction of shared reality. The paper provides an excellent summary of how individual tendency towards meaning-making leads to a process of culture-informed information transmission, ultimately resulting in cultural norms and essentialist cognition.

60. Kruglanski AW: *Lay Epistemics and Human Knowledge: Cognitive and Motivational Bases*. Springer Science & Business Media; 2013.

61. Livi S *et al.*: **Epistemic motivation and perpetuation of group culture: effects of need for cognitive closure on trans-generational norm transmission**. *Org Behav Hum Decis Process* 2014, **129**:105-112.

62. Fu JH-y *et al.*: **Epistemic motives and cultural conformity: need for closure, culture, and context as determinants of conflict judgments**. *J Pers Soc Psychol* 2007, **92**:191.

63. Chao MM, Chiu C: **Epistemic functions of culture**. *Cult Process: Soc Psychol Persp* 2011:81-95.

64. Kendal J, Giraldeau L-A, Laland K: **The evolution of social learning rules: payoff-biased and frequency-dependent biased transmission**. *J Theor Biol* 2009, **260**:210-219.

65. McElreath R *et al.*: **Applying evolutionary models to the laboratory study of social learning**. *Evol Hum Behav* 2005, **26**:483-508.

66. Galinsky AD, Magee JC, Gruenfeld DH, Whitson JA, Liljenquist KA: **Power reduces the press of the situation: implications for**

creativity, conformity, and dissonance. *J Pers Soc Psychol* 2008, **95**:1450.

67. Bowles HR, Gelfand M: **Status and the evaluation of workplace deviance**. *Psychol Sci* 2009, **21**:49-54.

68. Shavitt S, Cho H: **Culture and consumer behavior: the role of horizontal and vertical cultural factors**. *Curr Opin Psychol* 2016, **8**.

69. Brewer MB: **The social self: on being the same and different at** ●● **the same time**. *Pers Soc Psychol Bull* 1991, **17**:475-482.
Optimal distinctiveness theory, as introuced in this seminal paper, provides an excellent framework for when people will choose to disobey norms that might even be pragmatically functional. People are conceptualized as simultaneously balancing a distinctive identity while allying with favorably groups of high status. The paper is an integration of previous social identity theory with perspectives on the self.

70. MacCoun RJ: **The burden of social proof: shared thresholds and social influence**. *Psychol Rev* 2012, **119**:345.

71. Berger J, Heath C: **Who drives divergence? Identity signaling, outgroup dissimilarity, and the abandonment of cultural tastes**. *J Pers Soc Psychol* 2008, **95**:593.

72. Leung AK-Y, Cohen D: **Within-and between-culture variation: individual differences and the cultural logics of honor, face, and dignity cultures**. *J Pers Soc Psychol* 2011, **100**:507.

73. Warren D: **Constructive and destructive in organizations**. *Acad Manage Rev* 2003, **28**:622-632.

74. Spreitzer GM, Sonenshein S: **Toward the construct definition of positive deviance**. *Am Behav Sci* 2004, **47**:828-847.

75. Jetten J, Hornsey MJ: **Deviance and dissent in groups**. *Ann Rev* ●● *Psychol* 2014, **65**:461-485.
In this annual review chapter, Jetten and Hornsey provide an excellent review of the study of deviance and dissent. The authors discuss the reasons for deviance and dissent, and the motives behind rejecting or accepting dissent within a group, and why deviance and dissent can be valuable. Their discussions are framed by a strong argument to study deviance and dissent more broadly, in terms of its function for groups as well as its role in conflict.

76. Malinowski B: **Fishing in the Trobriand Islands**. *Man* 1918, **18**:87-92.

77. Berry JW, Annis RC: **Acculturative stress the role of ecology, culture and differentiation**. *J Cross-Cult Psychol* 1974, **5**:382-406.

78. Ensminger J, Henrich J: *Experimenting with Social Norms: Fairness and Punishment in Cross-cultural Perspective*. Sage Foundation; 2014.

79. Cohen D: **Cultural variation: considerations and implications**. *Psychol Bull* 2001, **127**:451.

80. Kashima Y, Wilson S, Lusher D, Pearson LJ, Pearson C: **The acquisition of perceived descriptive norms as social category learning in social networks**. *Soc Netw* 2013, **35**:711-719.

81. Greenfield PM: **The changing psychology of culture from** ●● **1800 through 2000**. *Psychol Sci* 2013, **24**:1722-1731.
In this paper, Greenfield used a new linguistic tool — the google ngram viewer — to track words of interest over time. Greenfield selected words that either represented individual expression, or collective duty, and showed that these words changed in their expression depending on the rates of individuals from rural to urban areas.

82. Chiu CY, Lee SL, **Implicit learning of descriptive norms**. In *Paper presented at the Annual Meeting of the Society for Experimental Social Psychology*. Washington, DC.

83. Kwan LY-Y, Yap S, Chiu C-y: **Mere exposure affects perceived descriptive norms: Implications for personal preferences and trust**. *Org Behav Hum Dec Process* 2015, **129**:48-58.

84. Pelto PJ: **The differences between "tight" and "loose" societies**. *Society* 1968, **5**:37-40.

85. Triandis HC: **The self and social behavior in differing cultural contexts**. *Psychol Rev* 1989, **96**:506.

86. Gelfand MJ et al.: **Differences between tight and loose cultures:** ●● **a 33-nation study**. *Science* 2011, **332**:1100-1104.

An international sample of 33 countries was surveyed regarding the strength of cultural norms and tolerance for normative deviance. While previous work had foreshadowed the importance of norm strength — termed as tightness–looseness — this paper provided a systematic analysis of how norm strength influences processes at both the culture and individual level, and offered a careful examination of how ecological threat affects the tightening of cultural norms.

87. Roos P et al.: **Societal threat and cultural variation in the** ●● **strength of social norms: an evolutionary basis**. *Org Behav Hum Decis Process* 2015, **129**:14-23.
This paper modeled the evolutionary emergence of social norms. Integrating research in cross-cultural psychology with evolutionary game theory, the authors show that groups that face a high degree of threat develop stronger norms for organizing social interaction than those who face comparatively weaker threat. Their results informed the development of both cooperation and coordination norms, and represented the first mathematical formulation of cultural tightness–looseness theory.

88. Dutta S, Rao H: **Infectious diseases, contamination rumors and ethnic violence: Regimental mutinies in the Bengal Native Army in 1857 India**. *Org Behav Hum Dec Process* 2015, **129**:36-47.

89. Murray DR, Trudeau R, Schaller M: **On the origins of cultural differences in conformity: four tests of the pathogen prevalence hypothesis**. *Pers Soc Psychol Bull* 2011, **37**:318-329.

90. Harrington JR, Gelfand MJ: **Tightness–looseness across the 50 United States**. *Proc Natl Acad Sci* 2014, **111**:7990-7995.

91. Mu Y, Kitayama S, Han H, Gelfand MJ: **How culture is** ●● **embrained: cultural differences in event-related potentials of social norm violations and their behavioral consequences**. *Proc Natl Acad Sci* 2015 http://dx.doi.org/10.1073/pnas.1509839112.
This paper combined noninvasive EEG with a new social norm violation paradigm to examine the neural mechanisms underlying the detection of norm violations and how they vary across cultures. While both U.S. and Chinese showed consistent negative deflection of event-related potential around 400 ms (N400) over the central and parietal regions when detecting norm violations, only Chinese evidenced the N400 at the frontal and temporal regions. The frontal N400 predicted a variety of behavioral and attitudinal measurements related to the strength of social norms, including higher culture superiority and self-control but lower creativity.

92. Mrazek AJ et al.: **The role of culture–gene coevolution in morality judgment: examining the interplay between tightness–looseness and allelic variation of the serotonin transporter gene**. *Cult Brain* 2013, **1**:100-117.

93. Kitayama S, King A, Hsu M, Liberzon I: **Dopamine-system genes and cultural acquisition: the norm sensitivity hypothesis**. *Curr Opin Psychol* 2016, **8**.

94. Kashima Y: **Cultural dynamics**. *Curr Opin Psychol* 2016, **8**.

95. Lewis K, Gray K, Meierhenrich J: **The structure of online activism**. *Socio Sci* 2014, **1**:1-9.

96. Gao W, Qiu L, Chiu C, Yang Y: **Diffusion of opinions in a complex culture system: implications for emergence of descriptive norms**. *J Cross-Cult Psychol* 2015, **46**:1252-1259.

97. Harrington JR, Boski P, Gelfand MJ: **Culture and national well-** ●● **being: should societies emphasize freedom or constraint?** *PLoS One* 2015, **10**.
By gathering cultural indicators of well-being like depression, suicide rate, and self-reported happiness, the authors were able to show that cultural tightness–looseness has a curvilinear effect on well-being. Countries that report the lowest level of well-being are typically extremely tight or extremely loose.

98. Eun C, Wang L, Xiao S: *Culture and R². Working Paper*. Georgia Institute of Technology; 2014.

99. Chua RY, Roth Y, Lemoine JF: **The impact of culture on creativity how cultural tightness and cultural distance affect global innovation crowdsourcing work**. *Admin Sci Quart* 2014. 0001839214563595.

100. Crossland C, Hambrick DC: **Differences in managerial discretion across countries: how nation-level institutions affect the degree to which CEOs matter**. *Strat Manage J* 2011, **32**:797-819.

101. Atkas P, Hanges P, Gelfand MJ: **Cultural tightness–looseness and perceptions of effective leadership**. *J Cross-Cult Psychol* 2015 http://dx.doi.org/10.1177/0022022115606802.

102. Wilson DS *et al.*: **Evolving the future: toward a science of intentional change**. *Behav Brain Sci* 2014, **37**:395-416.

103. Wilson DS: **Intentional cultural change**. *Curr Opin Psychol* 2016, **8**.

104. Lee NR: *Social Marking: Influencing Behaviors for good*. Sage; 2011.

105. Paluck EL: **Peer pressure against prejudice: a high school field
•• experiment examining social network change**. *J Exp Soc Psychol* 2011, **47**:350-358.
In this paper, Paluck described an intervention in high schools where she explicitly targeted popular students as transmitters of intervention information. By conceptualizing popular students as norm-spreaders, Paluck was able to track the network of information dissemination outward, and identify how targeted interventions can best mobilize large-scale change.

106. Riordan BC *et al.*: **A brief orientation week ecological momentary intervention to reduce university student alcohol consumption**. *J Stud Alcohol Drugs* 2015, **76**:525-529.

107. Paluck EL: **Reducing intergroup prejudice and conflict using the media: a field experiment in Rwanda**. *J Pers Soc Psychol* 2009, **96**:574.

108. Paluck EL, Green DP: **Deference, dissent, and dispute resolution: an experimental intervention using mass media to change norms and behavior in Rwanda**. *Am Pol Sci Rev* 2009, **103**:622-644.