Cultural Sentiments and Schema-Consistency Bias in Information Transmission

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Sociologists have well documented the negative outcomes associated with race-, class-, and gender-based cultural stereotypes and related schema-consistency biases. How these biases become culturally entrenched is less well understood. In particular, previous sociological research has neglected the role of information transmission processes in perpetuating cultural biases. In this study, I combine insights from the cultural cognition, affect control theory, and cultural transmission frameworks to examine how one form of internalized culture—fundamental cultural sentiments—affects the content of information shared in communication. I argue that individuals communicate narratives in ways that minimize deflection of internalized cultural sentiments, resulting in cultural-consistency bias. I test this proposition using a serial transmission study in which participants read and retell short stories. Results show that culturally inconsistent, high-deflection information experiences an initial boost in memorability, but consistency biases ultimately win out as information is altered to increase cultural consistency in transmission. I demonstrate that deflection provides a promising measure of cultural schema-consistency. This measure is predictive of the information that individuals share in communication and the changes that occur to this information in the transmission process.

Much of the information individuals discuss in day-to-day life is obtained secondhand. From national news events to workplace gossip, individuals often share stories about people and events that they have not personally observed with others who likewise have never observed them. As these stories spread, each step away from the original source represents an opportunity for the information to be distorted. Despite the pervasiveness of this phenomenon, little sociological research has been devoted to understanding the systematic changes that information is likely to undergo as it is transmitted. In particular, previous research neglects the role of information transmission processes in perpetuating problematic cultural biases.

Psychological research on cultural transmission finds that information individuals share in communication is often colored by a schema-consistency bias (Mesoudi and Whiten 2008; Kashima and Yeung 2010). In the case of stereotypes (one type of cultural schema), individuals tend to retain more stereotype-consistent than stereotype-inconsistent information when retelling stories, even when attempting to exactly reproduce the story. In chains of communication, schema-consistency bias tends to increase with each retelling.
This phenomenon has wide-reaching implications, given that secondhand information is often used in important decision-making processes. For instance, jury members interpret and discuss others’ eyewitness testimonies to render verdicts, and hiring and promotion committee members discuss others’ peer performance evaluations to arrive at employment decisions; these discussions often result in race- and gender-biased outcomes (Levinson 2007; Correll, Benard, and Paik 2007).

In the aggregate, the selective transmission of schema-consistent information reinforces existing cultural biases, increasing the likelihood of receiving information that reaffirms cultural stereotypes and impeding the spread of information that might challenge or disconfirm them (Lyons and Kashima 2003; Hunzaker 2014). In recent years, increasing social media use has magnified this effect. Consistency bias and selection into homophilous content–sharing networks combine to create ideological echo chambers, facilitating the rapid spread of consistency-biased misinformation among like-minded individuals (Shin et al. 2016). Uncovering the mechanisms driving schema-consistency bias in information transmission is key to both understanding and potentially undermining the reproduction of cultural biases.

Previous cultural transmission research has focused primarily on inter-individual mechanisms generating cultural-consistency bias in communication (Lyons and Kashima 2003; Clark and Kashima 2007). This research suggests that such bias is generated as individuals work to create culturally consistent narratives for their audiences. However, recent findings in cultural sociology emphasize the importance of internalized culture as a source of individual motives for action and patterns of judgment (Vaisey 2009; Lizardo and Strand 2010; Vaisey and Lizardo 2010). This suggests there are also important intra-individual forces underlying schema-consistency bias.
In this paper, I apply affect control theory’s model of cultural meaning maintenance to the study of cultural information-transmission processes to examine one such internal mechanism. According to affect control theory, individuals construct their actions and experiences in ways that confirm previously held cultural meanings of their own and others’ identities in order to avoid deflection—a sense of strangeness or strain that results when experiences do not confirm internalized cultural meanings (Heise 1979; Smith-Lovin and Heise 1988; Robinson and Smith-Lovin 2006; Heise 2007). At the root of this (generally unconscious) motivation is a need “to experience an orderly, knowable world” (MacKinnon 1994:55). 

Individuals derive their expectations about what they should experience from culturally shared affective meanings. Affect control theory models this process of meaning maintenance mathematically, allowing deflection to be estimated as a quantitative score. 

In an information transmission framework, deflection—as an inverse measure of cultural schema-consistency—provides a theory-based metric of the extent to which information shared about events confirms cultural meanings. Similarly, observed change in deflection provides a measure of the increasing or decreasing cultural schema-consistency. Past research both in affect control theory and in cultural sociology has focused on the influence of internalized culture on action. It seems a natural extension of this premise that in addition to acting to confirm cultural understandings, individuals communicate narratives to confirm these meanings as well. The purpose of this study is to determine whether and how the theorized need for cultural schema-consistency—operationalized as the reduction of deflection—affects the content of information shared in interpersonal communication.

I begin with an overview of work in the cultural transmission tradition. Then, I discuss recent research in cultural sociology regarding internalized culture as a motivating force and the
implications of this work for studies of schema-consistency bias in information transmission. I then explore affect control theory’s concept of deflection as a tool for modeling internalized culture and its relationship to schema-consistency bias in communication. I draw on recent research from the cognitive sciences to outline a model linking the cognitive and affective components of cultural schema-consistency bias. Finally, I test the proposed relationship between deflection and information transmission empirically, using a serial transmission study in which participants read and retell narratives containing a mixture of low- and high-deflection information.

The results of this study show that culturally inconsistent, high-deflection information experiences an initial boost in memorability. Consistent with this study’s hypotheses, however, individuals tend to alter high-deflection information to increase its cultural consistency. This tendency, coupled with individuals’ tendency to add more low- than high-deflection information, leads to more culturally consistent (lower-deflection) narratives by the end of transmission chains.

These findings indicate that deflection provides a promising (inverse) measure of cultural schema-consistency. I show that this measure is predictive of the information that individuals are likely to communicate and of the changes that occur to information in the transmission process. Overall, these results demonstrate that fruitful connections can be made between the cultural cognition and affect control research traditions.
THEORETICAL BACKGROUND

Cultural Transmission Studies

In cultural transmission research, serial transmission studies examine the impact of cognitive and cultural biases on information shared in communication. In these experiments, narratives are retold along transmission chains (much like the game of “telephone”), and researchers measure changes to the narrative at each stage of the chain. This experimental task mimics word-of-mouth spread of information. Changes to information observed in the transmission process represent distortions that occur in communication.

Early work focused on cross-cultural narrative transmission. Bartlett (1932) found that narratives became distorted as participants altered unfamiliar accounts (Native American folktales) to conform to more familiar cultural schemas (drawn from European folktales). Work in this tradition has argued that this phenomenon is rooted in reconstructive memory processes (McClelland 1995). In this model, schema-consistency bias is produced as individuals draw on previously internalized schemas to interpret (often partial) accounts that they received. When this occurs, they fill in lost details and misremember information in schema-consistent ways (for overview of this work, see Kashima 2000:595–596; and Mesoudi and Whiten 2008:3491).

The tradition gained attention again in the early 2000s with the growing interest in social networks and cultural evolution (Mesoudi and Whiten 2008). This newer work focuses on how individuals use stereotypes to transform information, finding that as stories proceed through serial transmission chains, they are likely to contain more stereotype-consistent information with each retelling (Kashima 2000; Kashima and Yeung 2010).

This effect becomes more pronounced when the retelling task is presented as communication-based rather than memorization-based (Lyons and Kashima 2006). Individuals
also retain more stereotype-consistent information in their reconstructed narratives when they believe their audience shares the stereotype under study (Lyons and Kashima 2003; Clark and Kashima 2007). These findings led to the conclusion that stereotype-consistency bias forms as individuals draw on information that they perceive to be shared (schema-consistent, stereotypical information) in order to construct culturally consistent narratives for their audience.

Although this work establishes that individuals are subject to a cultural-consistency bias in communication, it has overwhelmingly focused on external mechanisms driving this bias to the exclusion of potential intra-individual mechanisms. This empirical gap likely has its roots in the definition of cultural stereotypes in these studies as external constructs available to be used by individuals. These studies have often used made-up “stereotypes” regarding a fictitious culture, precluding the possibility that the stereotypes are internalized by participants (Lyons and Kashima 2003; Klein, Clark, and Lyons 2010; Yeung and Kashima 2012). Therefore, this work has been less well suited to examining potential internal mechanisms driving cultural-consistency biases in information transmission.

*Insights from Recent Cultural Sociology*

Understanding the intra-individual forces generating cultural schema-consistency bias is particularly crucial given recent research in cultural sociology. Work on culture and cognition highlights the independent causal role of internalized cultural elements as motivation for individual action (Vaisey and Lizardo 2010). These internalized elements of culture—schemas—are defined as “deep, largely unconscious networks of neural associations that facilitate perception, interpretation, and action” (Vaisey 2009:1686).
According to this developing model of culture and cognition (Vaisey 2009; Lizardo and Strand 2010; Collett and Lizardo 2014; Shepherd 2014), although culture may at times facilitate individual action by providing external tools that enable action (as in Swidler’s [1986] “toolkit model” and recent cultural transmission studies), it more frequently provides an internal motivation for action. Internalized associative schemas guide routinized actions and perceptions, with a tendency toward self-affirming experiences and away from potentially challenging ones (Strauss and Quinn 1997; Bargh and Williams 2006; Vaisey 2009; Lizardo and Strand 2010).

Conceptualizing cultural consistency in terms of schema-consistency carries certain methodological considerations (Vaisey 2009). In the context of information transmission studies, this requires the use of a measure of cultural consistency designed to engage the cognitive and affective associations that govern schema-based cognition. I propose that affect control theory’s concept of deflection provides such a theoretical tool.

**Affect Control Theory and the Motivation for Cultural Consistency**

Affect control theory models the process by which individuals construct lines of social action to maintain cultural meanings (Heise 1979, 2007). The theory states that individuals enact and interpret interpersonal events (consisting of Actors, Behaviors, and Objects) in ways that confirm cultural meanings for their own and others’ identities and behaviors. This is done to minimize deflection—a sense of strangeness or strain that results when these meanings are violated. The confirmation of shared, cultural meaning in interaction through minimizing deflection is the motivation for action in the theory (MacKinnon 1994).

Meaning is conceptualized in two ways in affect control theory. Fundamental sentiments are stable (generally shared) cultural meanings. Affect control theorists conceptualize these
fundamental cultural meanings in three affective dimensions—Evaluation (good versus bad), Potency (powerful versus powerless), and Activity (active versus passive)—which broadly capture connotative meanings across cultures and correspond to the basic dimensions along which much of behavior and perception is organized (Osgood et al. 1957; Osgood 1969; Scholl 2013). Affect control theory researchers estimate fundamental sentiments by conducting studies in which participants rate identities and behaviors along 9-point semantic differential scales for each of the three affective dimensions. For each term, individual scores are aggregated across each of the scales to derive the specific Evaluation, Potency, and Activity (EPA) scores that constitute its fundamental cultural meaning. Large dictionaries of fundamental sentiments measured in this way allow analysis of these shared cultural meanings.

By contrast, transient impressions are the situation-specific meanings an identity or action takes on in the context of an Actor-Behavior-Object event. For example, actors may seem more or less good, powerful, or active (compared with the baseline fundamental cultural meaning of their identity) depending on what actions they take or with whom they are interacting. These transient impressions are estimated using the theory’s impression formation equations (for more details, see Smith-Lovin and Heise 1988; Heise 2007). Deflection occurs when the transient impressions created by an event are different from the fundamental sentiment meanings associated with the identities and behaviors involved.

Operationally, deflection is formalized as the sum of squared differences between fundamental sentiments and transient impressions for each of the core components of the event (Actor, Behavior, and Object) along each of the three dimensions of affective meaning (Evaluation, Potency, and Activity). For example, the event “the mother kicks the baby”—which involves a good, powerful actor (Mother: $E = 2.80$, $P = 2.47$, $A = 1.30$), doing a bad, moderately
powerful thing (Kick: $E = -2.03$, $P = 0.50$, $A = 1.42$) to a very good and powerless object (Baby: $E = 2.10$, $P = -1.16$, $A = 0.94$)—makes the mother seem much less good (transient $E = -1.35$) and produces a very high level of deflection (deflection = 21.2). By contrast, a more expected event, “the mother kisses the baby” involving a very good action (Kiss: $E = 2.98$, $P = 2.31$, $A = 1.08$), produces little deflection (deflection = 1.5).

Conceptually, deflection is a measure of the extent to which a perceived event is consistent or inconsistent with internalized cultural sentiments. Thus, deflection represents a more truly cultural consistency, in contrast to other consistency-based theories (Festinger 1957; Heider 1958) in which individuals strive to avoid dissonance between within-individual inconsistent cognitions (MacKinnon 1994; Scholl 2013).\(^5\)

Deflection provides a generally implicit affective signal, alerting individuals to the rupture of the expected order and spurring action to bring their experience back into line with fundamental cultural sentiments. This action may involve (1) initiating new deflection-reducing interaction (e.g., someone who has committed a bad action may apologize to the object of the action); or (2) when action is not possible, cognitively redefining or reinterpreting one or more elements of the event to reduce deflection (e.g., an individual may redefine the mother who kicked the baby in the above example as a “monster” or reinterpret the kick as a “nudge” [Nelson 2006]). In sum, affect control theory suggests that individuals are motivated to construct social experiences to confirm their own preexisting expectations about reality, based on cultural meanings of identities and behaviors (Robinson and Smith-Lovin 1992).
Cultural Sentiments, Schema-Consistency, and Motivation

Like the cognitive schemas that form the core of recent cultural cognition models, affect control theory’s fundamental sentiments represent internalized elements of culture derived from repeated associations made over the course of experience in a shared cultural environment (Heise 2007). Further, both are theorized to motivate action (often subconsciously) by influencing the evaluation of and response to social experiences in order to affirm these associations. At this point the models ostensibly diverge, with one detailing the cognitive and the other the affective pathways to achieving a sense of cultural consistency. However, the strict segregation of these pathways is by and large a distinction of analytical expedience, rather than a natural one.

Although it is not often empirically examined, cultural cognition scholars do note the likely influence of affective states and “hot” cognition in the automatic processes schema-based cognition (DiMaggio 2002:277–278; Ignatow 2007:126; Vaisey 2009:1686; Cerulo 2010:121; Lizardo and Strand 2010:219; Vaisey and Lizardo 2010:1599). Research in this tradition acknowledges that schemas encode conceptual and affective elements in their neural associations, often describing abstract, conceptual elements as grounded in more basic affective and sensorimotor associations, which provide motivational thrust for action (Bachrach and Morgan 2013; D’Andrade 1981, 1995; Lakoff and Johnson 2003).

Similarly, affect control theory proposes that “all cognitions evoke affective association and that affective reaction [deflection] and processing, in turn, engenders new cognitions” (MacKinnon 1994:48). In this model, observing or experiencing a social event begins with an initial definition of the situation. Individuals initially perceive and (generally implicitly) label actor, behavior, and object, using context as a guide. In
turn, the affect control process guides selection from among the multiple conceptual event interpretations available in that cognitive-schematic framework toward the interpretation that is most affectively consistent (Heise 2007:37).

Schröder and Thagard (Schröder and Thagard 2013; Schröder et al. 2014) explicitly model the interrelation of these cognitive and affective pathways using parallel constraint satisfaction models of cognition (Kunda and Thagard 1996). Parallel constraint satisfaction models are quite similar to the connectionist models often used in cultural cognition work on schemas. Both conceptualize cognition in terms of neural associations, modeled as networks of concept elements connected by weighted associations. These weights represent the likelihood of an element’s activation (that is, the likelihood that it will be expected or perceived) given the activation of another element with which it is associated.

Parallel constraint satisfaction models are distinguished from the connectionist models typically used in sociology by their greater emphasis on the role of negative weights (indicating disassociation between elements) in inhibiting the spread of activation. Inhibition, in turn, is influential in the production of consistency bias, accounting for the exclusion of schema-inconsistent elements in the interpretation and generation of interaction events. Schröder and Thagard (2013:260) propose that these conceptual networks are organized hierarchically, with “shallow” symbolic associative meanings (e.g., mothers are “female” “family members”) grounded in “deep” affective and sensorimotor associative meanings (e.g., feelings of “warmth,” “happiness,” and “love” associated with one’s experiences with mothers). They demonstrate that the affective meaning distance between concept elements—operationalized in terms of affect control theory’s fundamental sentiments—can be used to model inhibition efficiently in neural
association networks. These findings indicate that affective consistency *does* constrain available cognitive interpretations and formulations of action.

In sum, there is strong reason to believe cognitive and affective processes are closely entwined in the production of cultural schema-consistency bias. When individuals experience or observe a social interaction event, their initial observations spur the activation of relevant conceptual schemas. In the affect control process, internalized cultural sentiments associated with conceptual elements in that schematic context constrain the availability of possible (re)interpretations and formulations of events through inhibition. In this model, deflection provides motivation (generally at the subconscious level) to reinterpret events or create new actions by signaling an event’s inconsistency with internalized cultural sentiments. For these reasons, I argue that deflection provides a measure of cultural consistency that is congruent with the schema-based model of cultural cognition when affect control theory’s scope conditions hold—that is, when (1) one or more Actor-Behavior-Object interaction events occur, and (2) one or more individuals (a) are actively attending to (labeling) the event(s) (b) and are members of the shared language culture under study (Robinson and Smith-Lovin 2006:139).9

**THE PRESENT STUDY**

Having established deflection’s potential to engage the mechanisms involved in cultural schema-based cognition, I set out to test the following proposition:

*Individuals communicate narratives in ways that minimize deflection and confirm previously internalized cultural sentiments.*
Previous research in the affect control theory and cultural cognition traditions demonstrates that individuals tend to act in ways that are consistent with previously internalized cultural meanings. In what follows, I demonstrate that individuals also communicate narratives in ways that confirm previously internalized cultural meanings. Because it is language-based, affect control theory is well suited to the study of communication and information transmission processes. Prior research (Alhothali and Hoey 2015; Dunphy and MacKinnon 2002) has used the theory to explore how individuals respond to information shared in news stories and folklore. However, this study represents the first test of the theory’s model of meaning maintenance in the context of communication and also of its relationship to the production of schema-consistency bias.

I test the core proposition using a serial transmission study in which participants are asked to read and retell narratives containing mixture of schema-consistent and schema-inconsistent information along short transmission chains. In this context, deflection operates as an inverse indicator of cultural schema-consistency. Low-deflection statements theoretically are those that would seem most culturally consistent, whereas statements producing higher levels of deflection would seem more inconsistent because of their distance from stable, cultural sentiment meanings. Implementing the concept of deflection in this way provides a formal, theory-based specification of cultural schema-consistency.

I propose two general mechanisms by which participants may reduce deflection and increase cultural consistency in the transmission process:
*Hypothesis 1* (*H1*): *Selection-based mechanisms*. Individuals will tend to retain low-deflection information and discard high-deflection information in their reproduced version of the narrative.

*Hypothesis 2* (*H2*): *Modification-based mechanisms*. Individuals will modify the content of the narrative they received in their own reproduced version of the narrative to reduce deflection. This may occur in two ways:

*Hypothesis 2a* (*H2a*): Individuals may transform initially high-deflection information by redefining actors, behaviors, or objects in their reproduced version of the narrative.

*Hypothesis 2b* (*H2b*): Individuals may add low-deflection information to their reproduced version of the narrative.

Two of the proposed strategies (*H1* and *H2b*) parallel those that participants have used in previous cultural transmission studies. Past work in the cultural transmission literature also proposes the strategy outlined in *H2a*—that information is sometimes *transformed* be more schema-consistent in the transmission process (Lyons and Kashima 2006). However, in the past, this has been difficult to operationalize quantitatively and thus to test directly. Here, the use of the deflection concept allows me to assess transformed events for their cultural consistency in a systematic way.

In what follows, I begin by providing a detailed description of the study design and the procedures used to collect data. I then present the analyses and results in three steps. First, I examine overall trends in deflection-reduction across the transmission chains. In the two
subsequent sets of analyses, I provide a detailed description of two classes of mechanisms that lead to the observed reduction in overall deflection.

**DATA AND METHODS**

This study used an online format, with data collected using Qualtrics survey software, and was conducted using Amazon Mechanical Turk (hereafter, MTurk). Although serial transmission studies have traditionally been conducted in a laboratory setting, at least one previous study used an online format effectively (Hunzaker 2014).

MTurk is a crowdsourcing website operated by Amazon that allows “requesters” (typically businesses or researchers) to post short tasks to be completed by site users (“workers”) in exchange for payment. In recent years, social science researchers have increasingly adopted the site as a platform for efficient participant recruitment (Paolacci and Chandler 2014; Shank 2016). This online method allows for recruitment from a more diverse participant pool than the typical undergraduate experimental participants but sacrifices some control. Recent research (Weinberg, Freese, and McElhatten 2014) shows that data from MTurk participants—particularly in response to vignette experiments—are of comparable or higher quality than those obtained from traditional undergraduate lab-based participants.

*Narrative Construction*

To construct the study narrative, I began by selecting an identity for the focal character. I selected the “unemployed person” identity because of its relatively strong, negative fundamental cultural meaning across each sentiment dimension ($E = -1.49, P = -2.37, A = -1.67$), which is likely to generate high levels of deflection.$^{10}$
In the second step, I selected a setting and premise for the story. To avoid implicit redefinition of the main character based on the narrative context or chosen alters, I set the narrative in an impersonal setting (a store) with impersonal alters (e.g., a mother, as opposed to his mother). Choosing potential alters, then, was the third step. I considered 12 potential alters—salesclerk, shoplifter, mother, grandmother, baby, businesswoman, pastor, nurse, doctor, police officer, and employee—in order to include a mixture of possible evaluation, potency, and activity values.

For each of these potential alters, I then used affect control theory’s Interact software\textsuperscript{11} to simulate all possible Actor-Behavior-Object combinations of each alter and the main character with all 500 behaviors in the 2003 Indiana sentiment dictionary, resulting in 12,000 potential events. Deflection levels for these events ranged from 1.06 (the salesclerk requests something from the unemployed person) to 21.38 (the mother murders the unemployed person).

I narrowed the list of potential events to low- and high-deflection events. To maximize the distinction between levels of deflection, I selected events from the top and bottom 10\% of deflections from the simulated events. Low-deflection statements were those with deflection less than 3.0, and high-deflection statements were those with deflection greater than 11.0. Finally, with the initially selected premise in mind (an unemployed person interacting with the selected impersonal alters in a store setting), I arranged an initial draft narrative, selecting 10 high-deflection and 10 low-deflection statements from the narrowed pool of events to be pretested for perceived cultural consistency.

After the statement pretesting (described below), I selected the eight low-deflection events and eight high-deflection events that showed consistent patterns of response for inclusion in the final narrative. Deflections for these events ranged from 1.51 to 2.96 for low-deflection
events, and from 11.19 to 14.52 for high-deflection events. I arranged these Actor-Behavior-Object events (for instance, “police officer, question, unemployed person”) into the final narrative’s structure, including equal numbers of low- and high-deflection statements interspersed as evenly as possible throughout the narrative; I then elaborated the events into complete sentences (in the case of the previous example, “the police officer questioned the unemployed person about the missing items”). I also included 12 non–Actor-Behavior-Object statements as introductory and transitional information. The final study narrative centers on an unemployed man who attempts to stop a theft in progress in a convenience store and is later accused of shoplifting himself. See Appendix A for full narrative content.

Statement Pretesting

A crucial step prior to conducting the final study was to determine whether deflection in fact provides a measure of a statement’s cultural consistency. To this end, I pretested each of the 20 statements considered for use in the study narrative to determine whether low- and high-deflection statements were perceived to be culturally consistent and inconsistent (respectively) as proposed. In the pretest, 52 respondents recruited from MTurk rated each statement for its cultural consistency. The participant sample was 58% female and 75% white, with a mean age of 39. Nearly half were college educated. The sample leaned Democrat (46%) rather than Republican (14%). Although I used MTurk qualifications to limit participation to current U.S. residents, two participants reported being born outside of the United States, and two others declined to report their country of birth. I excluded these four participants from analyses.12

To evaluate the perceived cultural consistency of each statement, the pretest asked respondents to rate each of the 20 statements (presented in random order) on a scale of 1 to 5,
where 1 represented “Unexpected” or “Bizarre,” and 5 represented “Expected” or “Typical,”
given their knowledge of the sorts of people involved in each interaction. To test the
relationship between deflection and perceived cultural consistency, I first examined whether low-
deflection events were, on average, perceived as more consistent than high-deflection events.
For this set of analyses, each event statement was treated as an observation (n = 20).

Results show that deflection (measured continuously) has a strong, significant, and
inverse correlation with perceived cultural consistency (r = −.720, n = 20, p < .001). A t-test
further confirms that low-deflection events were, on average, perceived as more culturally
consistent (M = 3.503, SD = .514) than high-deflection events (M = 2.578, SD = .498; t(18) =
4.087, p < .001).

Figure 1 graphically displays participants’ consistency ratings for each event statement
examined, including the mean rating, with error bars representing +/− 1 SD. Again, as proposed,
most low-deflection events were perceived as more culturally consistent than not (M > 3.0), and
most high-deflection events were perceived as more inconsistent than not (M < 3.0). Two events
(“the unemployed person followed the shoplifter” and “the customer heaped abuse on [abused]
the unemployed person”) showed a bimodal distribution of ratings. Two others (“the shoplifter
left the unemployed person” and “the employee rescued the unemployed person”) showed no
strong pattern in either direction. However, no event’s ratings were distributed in the opposite
of the expected pattern.

[FIGURE 1 ABOUT HERE]
These analyses show that low-deflection events tend to be perceived as more culturally consistent, and higher-deflection events tend to be perceived as less consistent. The findings provide strong support for deflection’s proposed function as an inverse measure of cultural consistency in this study. They also represent a confirmation of affect control theory’s core proposition that deflection is inversely related to judgments of likelihood.

Serial Transmission Study Procedure

I recruited final study participants using MTurk. Participants were instructed that they would be given five minutes to read through a short story twice, and would then be expected to retell it later in the experiment to be read by the next participant in their chain. Participants were prompted to imagine how they might retell the story to a friend or acquaintance in conversation. They were prompted to “assume that the story’s original teller is not lying, but keep in mind that the information as they present it may be mistaken, misinterpreted, or misleading” (prompt adapted from Nelson 2006).

After the five-minute reading task, participants were redirected to a distracter task, which was included to remove the narrative from the participants’ working memories and to encourage narrative reconstruction rather than simple memorization.

Following the distracter task, participants were asked to retell the story they read and were reminded that their version would be used for the next participant in the chain. They were again encouraged to consider how they might retell the story to a friend or acquaintance and were prompted to focus on retelling the story as they believed it happened. Ten minutes were allotted for this task. This procedure was repeated for each of the four participants in each chain.
A number of steps were taken to ensure participants were engaged and actively participating. First, over the course of the study, participants were asked to respond to three active participation checks in which they were required to read instructions fully in order to be able to respond correctly. I excluded the data from five participants who failed these tests. Second, each element of the study was set to automatically advance after the allotted time for that task. I excluded data from 24 participants who did not meet baseline thresholds for time spent reading and retelling the narrative or for narrative length (based on pretesting), did not fully complete their narrative retell (because of the aforementioned page auto-advance), did not enter any words in the distractor task, or showed evidence of copying and pasting their narrative. I recruited new participants to replace the excluded participants so that all transmissions chains were complete.

Narrative Coding Procedure

After the data were collected, two hypothesis-blind research assistants independently coded each respondent’s narrative. Statements were coded into one of four categories. If the narrative retained an exact Actor-Behavior-Object event from the original narrative, that statement was coded as maintained. If a statement from the narrative was recognizable as coming from a specific Actor-Behavior-Object event from the original narrative but differed on one or more of the Actor-Behavior-Object event elements, it was coded as transformed (for example, “the mother accused the unemployed person” → “the customer accused the unemployed person”). Any Actor-Behavior-Object events that were entirely novel or where coders could not agree on the original statement from which the participant’s statement was derived were coded as added. Actor-Behavior-Object events from the original narrative that were
not at all present or became non–Actor-Behavior-Object statements—that is, statements that did not have an actor, behavior, and object (e.g., “the mother accused the unemployed person” → “the unemployed person was accused of stealing”)—were coded as lost.\(^{17}\) In this stage of coding, coders achieved a high level of reliability, with 90% agreement prior to discussion (Cronbach’s alpha = .88; Cohen’s kappa = .81). After coding independently, the two research assistant coders met to discuss and resolve any discrepancies prior to the analysis.

To calculate resulting deflections for participants’ transformed and added Actor-Behavior-Object events, identities and behaviors that participants used in these statements were translated into terms with ratings available in the 2003 sentiment dictionary. The researcher and one hypothesis-blind research assistant translated each participant-used identity and behavior independently. For example, in this step “talked him out of shoplifting” became “dissuaded.” Identities and behaviors were translated out of context of their events in order to avoid potential coding bias.\(^{18}\)

**Descriptive Statistics**

The final data include 50 transmission chains, each containing four individuals (200 participants). Participants in the final study are demographically similar to those of the pretest and of MTurk studies, generally.\(^{19}\) The study sample was 58% female and 74% white, with a mean age of 34. Half of participants are college educated (BA or higher), and 13% reported income below $20,000. As with the pretest, the sample tended to lean more Democrat (45%) than Republican (11%). All participants were current U.S. residents. Five participants reported being born outside the United States; however, these participants did not differ significantly from
U.S.-born participants in terms of narrative length or deflection-based narrative content and were therefore included in the final analysis.

Descriptive statistics of narrative content at each transmission chain link—including the average number of low- and high-deflection statements used, the average narrative length (in words), and the percentage of participants who included (maintained or transformed) each original Actor-Behavior-Object event—are available in Table B1 in Appendix B. On average, changes to the narrative were largest in the first transmission step (from the original narrative to link 1), followed by gradual information loss—as shown by decreasing average word count and statement counts—over the course of links 2–4.

OVERALL TRENDS IN NARRATIVE CONTENT

Analyses

In this first set of analyses, I examine whether changes to participants’ narratives at each stage of the transmission chain increased the narratives’ cultural consistency by reducing deflection. I first compare within-participant differences in amount of low- versus high-deflection information used to test whether individuals on average demonstrate a cultural schema-consistency bias. Because the thresholds for high- and low-deflection used to generate the study narrative represent the very extremes of possible deflections (the top and bottom 10% only), these categories are expanded in these analyses to include the top and bottom quartiles of the distribution of possible deflections resulting from events involving identities used in the narrative (high-deflection > 8.5; low-deflection < 4.0). Then, I compare average changes in overall deflection of participants’ narratives from link to link to determine whether the narratives’ overall cultural consistency increased over the course of the chains.
Results

Figure 2 displays the average number of low- versus high-deflection statements participants used at each stage of the transmission chain. As predicted, these descriptive results show that participants, on average, used greater total numbers of low- compared with high-deflection events (including maintained, transformed, and added statements) in their reproduced narratives. Paired $t$-tests comparing participants’ average number of low- versus high-deflection statements find that the difference displayed in Figure 2 is statistically significant at each stage in the transmission chain (link 1, $p < .05$; links 2–4, $p < .00$; all significance tests are two-tailed).

Next, I examine the cumulative impact of these within-individual differences over the course of the transmission chain. Table 1 displays results from paired $t$-tests comparing average deflection of narratives that participants received (link $n - 1$) to their reproduced version (link $n$). Average deflection steadily declines over the course of the transmission chain. These results provide strong support for the study’s overarching proposition: individuals tend to construct narratives that increase cultural consistency, as represented by the reduction of deflection.

I conducted additional analyses (not shown) to ascertain whether the use of high- and low-deflection statements varied by various demographic characteristics of participants. Results showed no significant variation in the amount of low-deflection, high-deflection, or total statements used by race, gender, political party, education, income, age, or recent experience.
with unemployment. This indicates that the deflection-reduction, cultural-consistency bias found here is likely a general social psychological tendency.

Robustness Check Analyses

I conducted further analyses to ensure the deflection-reduction tendencies observed here represent the meaning maintenance processes of interest and were not the result of random forgetting or variation in narrative quality. As noted in the theory, drawing on preexisting cultural schemas to fill in forgotten details is a primary mechanism through which schema-consistency bias is generated (Sperber 1996; Kashima 2000; Sperber and Hirschfeld 2004; Mesoudi and Whiten 2008). Thus, the goal of these analyses is not to rule out the impact of all recall errors on deflection-reduction. Rather, the goal is to rule out that undirected, meaning-independent errors in participants’ retellings could produce the observed levels of deflection-reduction.

To test for this alternative (less theoretically interesting) possibility, I use the Levenshtein distance between participants’ narratives and the narratives received as indicator of random, meaning-independent error in participants’ retellings (Brashears and Gladstone 2016).

Levenshtein distance is a natural language processing measure of the character-edit distance between two strings, calculated as the fewest number of edits—that is, character insertions (form → forum = 1), deletions (house → hose = 1), or substitutions (mug → pug = 1)—needed to transform one string into the other. Because the edit distance is measured character by character, it provides a context-free measure of the amount of error in a participant’s reproduction.

I use two-level multi-level linear regressions (with participants nested in chains) to test for the association of random error in a participant’s narrative with (1) the average deflection of
that participant’s narrative and (2) the change in average deflection from the narrative received to the participant’s narrative. If any memory-based omissions or changes to narrative content would necessarily produce the observed narrative deflections and reductions in deflection—indicating that random memory error, rather than the schema-consistency-based processes of interest, could be driving these outcomes—then I would expect the Levenshtein distance (the measure of this sort of error) to be significantly, negatively associated with the narrative deflection and the deflection-reduction outcome measures. By contrast, a lack of significant association between Levenshtein distance and these outcomes would show that random errors do not produce the observed decline in deflection, providing support for the hypothesized consistency bias.

[TABLE 2 ABOUT HERE]

Table 2 shows that error in participants’ retellings (as measured by Levenshtein distance) is not significantly associated with the average deflection of participants’ narratives, nor is it a significant predictor of the change in participants’ average narrative deflections from the narrative versions received. These results indicate that random recall errors in participants’ retellings are not responsible for (and do not inevitably produce) the changes in deflection observed here. Having established this general deflection-reduction tendency, in the following sections, I examine the two deflection-reduction mechanisms hypothesized to generate the overall decline in deflection.
SELECTION-BASED MECHANISMS

Analyses

The first hypothesized deflection-reduction mechanism (H1) predicts that participants will tend to retain low-deflection statements and lose high-deflection statements in their narratives. In this portion of the analyses, I first look descriptively at the relative amounts of low-versus high-deflection content from the original narrative that participants included in their own narratives, in order to show what information from the original narrative was available to participants to transmit at each stage of the chain.

Then, in the formal analyses, I use mixed-effects multi-level logistic regression models to examine the impact of a statement’s deflection on that statement’s propensity to be maintained, transformed, or included (that is, maintained or transformed, rather than lost) in that participant’s reproduced narrative. I use three-level models (with statements nested within participants nested within transmission chains) and include random intercepts at the participant and chain levels to account for baseline differences at these levels. Because participants often transformed statements, and a given statement therefore may have increased or decreased in deflection by the time it was actually received, I use a statement’s deflection as received by a participant (deflection in link $n - 1$, measured continuously) as my main predictor. I include a squared term for deflection in link $n - 1$ in each model to account for potential nonlinear effects of deflection on a statement’s propensity to be transmitted. I also control for link position.

Results

[FIGURE 3 ABOUT HERE]
Figure 3 presents average counts of low- and high-deflection event statements that were maintained (solid lines) and included (maintained or transformed; dashed lines) by participants from the original narrative. (Recall that maintained statements use the same Actor, Behavior, and Object as the original event statement, whereas transformed statements differ from the original event on one or more of these elements). Contrary to H1, Figure 3 demonstrates that participants maintained very nearly identical numbers of low- and high-deflection statements from the original narrative. Instead, participants were much more likely to include statements stemming from originally high-deflection statements in their own narratives. The difference in transmission rates only becomes apparent after transformed statements are added to the statement counts (included counts = maintained + transformed counts). This indicates that participants were more likely to receive information stemming from originally high-deflection statements, albeit in altered form.

Figure 4 graphically presents results from multi-level logistic regression models for statements’ likelihood of being maintained, transformed, or included (rather than lost) as predicted probabilities (see Online Appendix for a table of the full results). Variables for deflection and deflection squared are statistically significant in all models. Because these models are restricted to statements that were present in link \( n - 1 \) in order to generate the predictor variables, results should be interpreted as a statement’s probability of being maintained, transformed, or included, given that the participant received the statement.

[FIGURE 4 ABOUT HERE]
Figure 4 shows that participants were more likely to maintain lower-than-higher-deflection statements received from the original narrative. However, given that it was generally uncommon for participants to exactly maintain statements from the original narrative (either low- or high-deflection statements), these maintained, low-deflection statements comprise a very small proportion of participants’ narrative content.

Instead, participants were far more likely to include higher-than lower-deflection statements from the previous participant’s narrative. That the predicted probabilities of statement transformation map neatly onto those for inclusion illustrates that although participants were more likely to include (rather than lose) information stemming from higher-deflection events in their own narratives, these statements are also more likely to be transformations.

**MODIFICATION-BASED MECHANISMS**

*Analyses*

The second hypothesized mechanism (H2) predicted that participants would modify narrative content to increase cultural consistency by transforming initially high-deflection statements to reduce deflection (H2a) and by adding new low-deflection statements (H2b). In this final set of analyses, I begin by describing changes in deflection resulting from transformations of original statements in order to establish whether these transformations tended to result in a decrease in deflection, generally.

I then examine the link-to-link changes in deflection for transformed statements. I use multi-level linear regression models to assess the relationship between a statement’s deflection in the narrative a participant received and the change in deflection in the participant’s reproduced narrative (deflection in link \( n \) minus the deflection in link \( n - 1 \)). Again, these analyses use three-
level models (with statements nested within participants nested within transmission chains) and include random intercepts at the participant and chain levels. Following these regression analyses, I describe the specific types of statement transformations participants used. Finally, using a series of paired \( t \)-tests, I compare the relative number of low- versus high-deflection statements added by participants.

Results

Changes in Deflection

Figure 5 shows changes in deflection resulting from transformations of originally low-versus high-deflection event statements, by link position. Each dot represents a statement deflection; those below the reference line represent a decrease in deflection compared with the original statement, and those above the line represent an increase.

[FIGURE 5 ABOUT HERE]

Nearly all (97%) of the 442 transformed statements that were originally high-deflection resulted in a decrease in deflection compared with the original statements from which they were derived. Most (73%) of the 238 transformed statements that were originally low-deflection resulted in a slight increase or decrease in deflection (by less than 2 points) compared with the original statements.

As a robustness check to rule out that any transformations would necessarily result in deflections as low as those observed, I compare the observed deflections and changes in deflection with those resulting from randomly transformed events. The bottom right panel
displays deflections resulting from 1,000 simulated event transformations, which are intended to be representative of changes in deflection that might occur as the result of randomly filling in missing information (as opposed to the schema-consistency–based reinterpretation or filling-in mechanism proposed here). To generate these comparison events, I randomly replaced the Actor, Behavior, or Object—or two of these—of an original event from the pool of identities and behaviors that participants ever used in the study, given that these are those that seemed feasible to participants in the given context.

Comparing the observed transformations in panels for links 1–4 of Figure 5 with the random transformations shown in the last panel of Figure 5 shows that participants’ transformations of originally high-deflection events reduced deflection more often than would be expected by random chance. Additionally, participants’ transformations of originally low-deflection event statements were less likely to increase deflection than would be expected at random. As confirmed by $t$-tests comparing observed with random transformations, observed transformations resulted in significantly lower deflections ($M = 5.725, SD = 2.981$) than randomly transformed events ($M = 6.202, SD = 4.085$; $t(1,678) = –2.608, p < .01$). Observed transformations also resulted in significantly greater decreases in deflection from the original statement ($M = –3.043, SD = 4.171$) compared with random transformations ($M = –1.362, SD = 5.253$; $t(1,678) = –6.977, p < .001$). (See Online Appendix for the full table of results.)

Having established this general tendency, I now examine the link-to-link changes in deflection resulting from participants’ transformations. Figure 6 plots predicted values from models estimating the change in deflection of statements from the previous link, given the deflection of the statement as received by the participant. Models and predicted results shown in
the figure are separated by link position. (See Online Appendix for the full table of results and descriptive plots of the deflection change dependent variable.)

[FIGURE 6 ABOUT HERE]

As expected, model results show that participants tended to transform initially higher-deflection statements they received in order to reduce deflection. This tendency is consistent in link 1 ($\beta = -0.608, p < .001$), link 2 ($\beta = -0.447, p < .001$), and link 3 ($\beta = -0.427, p < .001$); however, it becomes weak and non-significant in link 4 ($\beta = -0.116, p > .05$), likely because of the decreasing availability of high-deflection statements across the chains. Only 27 high-deflection statements (including maintained, transformed, and added statements) remained among all narratives read by link 4 participants.

Description of Statement Transformations

To give the reader a sense of what these statement transformations might look like in practice, Table 3 displays examples of commonly used deflection-reducing transformation strategies along with resulting change in deflection for the examples shown. Of the 680 transformed statements included in participants’ narratives, most (53%) involved a change of only one event element—the Actor, Behavior, or Object—although sometimes participants changed two (39%) or all three (4%) elements.

[TABLE 3 ABOUT HERE]
Participants most commonly transformed event statements by altering the behavior (75%). This finding is consistent with previous research on event redefinition (Nelson 2006), indicating the relative stability of identities compared with behaviors in individuals’ reinterpretations of culturally inconsistent events. Changes of actors or objects were much less common (34% and 28%, respectively). The comparative stability of identities may be expected given the repetition of many identities within the narrative in contrast to behaviors, which were mentioned only once. In day-to-day experiences and interactions, we are also repeatedly exposed to others with stable identities—and identities tend to be more stable characteristics of people—while new behaviors are enacted moment to moment (Heise 2007). For this reason, redefinition of behaviors likely provided the least cognitively taxing route to deflection-reduction.

When participants transformed an actor or object, outright reidentification was uncommon. A small number of participants transformed statements to lower deflection by reassigning a behavior to a different actor or object from the original narrative. More often, actor or object transformations involved changes from specific identities to more general ones (e.g., mother → woman, or unemployed person → guy). MacKinnon and Heise’s (2010) Durkheim-Mauss taxonomy axiom proposes that identities exist in nested taxonomies that run from specific to general (e.g., mother → woman → human). Perhaps, then, moving up a level in the taxonomy (from the specific to general) may provide a means for reducing deflection without engaging in outright redefinition.

I conduct additional robustness check analyses to rule out that this sort of generalization is the result of purely undirected or unmotivated recall limitations rather than the schema-consistency, deflection-reduction processes of interest. In these analyses, I use a multi-level logistic regression model to assess the impact of (1) deflection of the statement in the narrative
received (measured as continuous) and (2) Levenshtein distance between participants’ received and reproduced narratives (used here, again, as an indicator random, meaning-independent error in participants’ retellings) on statements’ propensity to undergo transformation from a specific to a general identity (controlling for link position).

If these generalizations are driven by deflection-reduction tendencies, as hypothesized here, we should expect to find a significant, positive association between a statement’s deflection in link \( n - 1 \) and the likelihood of transforming a specific identity in that statement to general identity in link \( n \). Conversely, if observed generalizations are simply the result of random, undirected recall errors, then we should expect Levenshtein distance (as an indicator of this sort of error) to be significantly and positively associated with likelihood of transforming a specific to general identity, while deflection in link \( n - 1 \) should have no effect.

Results from this model found no significant association between Levenshtein distance and transformation from specific to general identities (\( \beta = 0.374, p = .282 \)). This indicates that generalization is not associated with random error in participants’ retellings. A significant, positive association between deflection in link \( n - 1 \) and transformation to general identity (\( \beta = 0.081, p < .01 \)), however, shows that higher-deflection statements were more likely to undergo specific to general identity transformations.\(^{24}\) Taken together, these results indicate that deflection-reduction, and not undirected recall errors, is motivating transformations from specific to general identities.\(^{25}\)

Finally, in addition to Actor, Behavior, and Object changes to events, participants sometimes attached mood modifiers to initially high-deflection statements in order to reduce deflection (6%). Although not a part of the original study design, affect control theory proposes (and is able to model) that individuals may modify identities with moods to make sense of social
events and reduce deflection, as an alternative to actor relabeling (Averett and Heise 1987; Robinson, Smith-Lovin, and Wisecup 2006). The most frequent instance of this is related to the most commonly included high-deflection statement: “the unemployed person kissed the employee” (deflection = 12.27; 58% of participants included this statement in some form). Participants frequently added the prefix “the unemployed person was so happy” to their version of this statement; for example, one participant stated, “The unemployed person was so happy that he kissed the employee before he left.” This alteration (to the happy unemployed person kissed the employee) reduces deflection by nearly half (7.06 for “happy”).

As noted earlier, not all transformations reduced deflection. The most common increases involved the statement, “The unemployed person begged the salesclerk to believe he was innocent.” Participants often reinterpreted “beg” (E = −1.42, P = −1.85, A = −0.58) as “explain the situation to” (translated to “explain something to” [E = 2.22, P = 1.80, A = 0.15] in the study dictionary terms) or “tell his side of the story to” (translated to “tell something to” [E = 1.06, P = 0.83, A = 0.52])—both of which are more good, powerful, and active behaviors than “beg.” However, participants also frequently modified these behaviors with the qualifier “tried to”; for example, one participant stated, “The unemployed person tried to explain the situation [to the salesclerk].” Perhaps behavioral modifiers modify a behavior’s meaning, as mood modifiers do for identities (as described earlier). However, this is not a part of the current affect control theory model.

Results for Added Statements

Finally, in addition to transforming statements, I hypothesized that participants would add low-deflection information to increase the narrative’s cultural consistency. Table 4 shows
results from a series of paired \( t \)-tests, comparing the average number of high-deflection (>8.5) versus low-deflection (<4.0) statements participants added by link. Participants were unlikely to add either low- or high-deflection events to their narratives (many added neither). When participants did add event statements, they were, as predicted, significantly more likely to add low-deflection statements. This tendency holds for all stages of the transmission chains except link 1, and it generally increased over the course of the transmission chain.

TABLE 4 ABOUT HERE

GENERAL DISCUSSION

In this study, I examine how one form of internalized culture and motivation—fundamental cultural sentiments and deflection-reduction—affects the content of information shared in communication. I proposed that, in addition to acting to confirm preexisting, culturally shared affective and schematic understandings, individuals also tend to communicate narratives in ways that confirm these understandings. This process generates a cultural-consistency bias in narrative transmission.

I proposed two possible mechanisms that individuals may use to reduce deflection and construct culturally consistent narratives: (1) selection-based mechanisms involving the selective maintenance of low-deflection statements and loss of high-deflection statements (H1); and (2) modification-based mechanisms involving the alteration of original narrative content to reduce deflection (H2)—either through the transformation of originally high-deflection events to reduce deflection (H2a) or the addition of novel low-deflection content (H2b).
The results show support for the latter of these hypotheses. Contrary to the selection hypothesis (H1), participants were equally (un)likely to maintain low- and high-deflection statements from the original narrative and tended to include (that is, to retain rather than lose) more information stemming from initially high-deflection events. Perhaps culturally inconsistent, high-deflection information stands out to participants in comparison with more mundane, low-deflection information, in the way that “man bites dog” is more inconsistent with our understanding of the relationship between men and dogs but is more memorable than the more commonplace “dog bites man.”

However, results also show—consistent with the study’s second set of hypotheses—that participants tended to transform the initially high-deflection events they included to decrease resulting deflection (H2a). This indicates that although culturally inconsistent, high-deflection information may be more memorable initially, cultural schema-consistency biases ultimately overpower this initial advantage as individuals tend to alter this information to make it more culturally consistent, in line with expectations from affect control theory and models of cultural cognition. Participants also increased the consistency of their narratives by adding more low-than high-deflection information, in line with hypothesis H2b. Over the course of the transmission chain, these deflection-reduction tendencies decreased overall narrative deflection, supporting the study’s overarching proposition that individuals communicate narratives in ways that increase cultural consistency and reinforce cultural meanings.

Scope Limitations of Results

This study and its theoretical predictions focus on one form of information transmission—the communication of narratives between individuals—placing some limitations
on the scope of the theory and results described. First, the predictions and results of this study speak only to the transmission of narratives or story-like information. Prior research indicates that a different process likely governs the transmission of discrete, context-free statements, which instead tends to favor schema-inconsistency (for an overview of this work, see Kashima 2000:595) and encourage message diversification (Brashears and Gladstone 2016). This tendency likely occurs because isolated statements are not subject to two of the primary forces encouraging schema-consistency bias in narrative transmission: filling in or making sense of gaps in story detail lost in previous transmission or in one’s own recollection because of memory limitations (Kashima 2000; Mesoudi and Whiten 2008). Similarly, this study’s predictions are limited to instances where information is transmitted more than one step from the original source. Prior work shows that schema-inconsistency bias is often greater in first- or single-step transmission (Kashima 2000), whereas schema-consistency wins out over repeated transmissions. Still, because individuals often discuss stories obtained secondhand (or beyond secondhand)—for instance, rumors, stories of friends of friends, social media discussions of news stories they have not personally read—the deflection-reduction, schema-consistency processes described in this paper applies to many forms of day-to-day communication.

CONTRIBUTIONS, FUTURE DIRECTIONS, AND CONCLUSIONS

This study represents the first attempt to integrate two prominent theories of culture and action in sociology: cultural cognition (Vaisey 2009; Lizardo and Strand 2010) and affect control theory (Heise 2007). It is also the first to extend insights from these action-based frameworks to the communication-based processes involved in the cultural transmission of information—a previously understudied process in the field of sociology. As such, the results and arguments
presented here stand to contribute to each of these fields, as well as to the discipline of sociology generally, in many ways.

First, previous cultural transmission studies have tended to rely on informal or ad hoc measures of cultural or schema-consistency (such as stereotypes). Cultural sociology has similarly struggled to develop formal measures of culture and cultural consistency (Mohr and Ghaziani 2014). In this paper, I argue that cultural schema-consistency can be parsimoniously modeled as affective consistency and thus that affect control theory’s concept of deflection provides a useful formal operationalization of cultural schema-consistency. In support of this argument, results from the statement pretest demonstrate that an event’s deflection has a strong, inverse relationship to perceptions of that event’s cultural consistency. Though this test was limited to the statements considered for use in the transmission study, future research should expand to test wider array of event statements. Because deflection has the dual benefit of being language-based as well as quantitative, this operationalization is likely to prove powerful for future research, given its natural synergy with the budding field of computational sociology and growing interest in “big data” and text-analysis methods (Bail 2014). Alhothali and Hoey (2015) recently made huge strides in this direction, implementing natural language processing-based solutions to two of the more time-intensive human coding processes in the present study: (1) extracting Actor-Behavior-Object events from text data (using grammar tree parsing), and (2) handling out-of-dictionary terms (developing a method to estimate EPA values for out-of-dictionary terms from known values of related terms). Using these methods, future studies will be able to extend the insights of this study to examine more “organic” communication processes—for example, the relationship of the processes described here to the production of ideological echo chambers on social media.
This implementation of deflection as a measure of cultural schema-consistency will further contribute to cultural transmission research by paving the way for future studies aimed at better understanding internal motivations generating cultural-consistency bias. Past research in this field has tended to focus on other-driven motivations for consistency, often using artificially generated stereotypes (precluding their internalization). Although inter- as well as intra-individual mechanisms likely underlie cultural-consistency bias, understanding internal mechanisms is crucial to avoid the conception of people as wholly externally determined, which is another form of oversocialization (Wrong 1961). Understanding both forms of motivation will also ultimately be required to combat the reproduction of cultural-consistency biases. Still, although deflection-reduction by its theoretical nature is an internal motivation, this study is unable to empirically adjudicate whether the initial benefits of higher levels of deflection for transmission is the result of greater memorability (an internal dynamic) or perceived interest value to others (an external motivation). Future experimental work manipulating participants’ knowledge of involvement in a transmission chain or knowledge about characteristics of the recipient of their narrative could more definitively test which is the case.

Similarly, although cultural cognition scholars frequently acknowledge the likely important role of affective processes in schema-based cognition, this research has yet to formally incorporate affect in theory or measurement. Previous affect control theory research (Heise 2007; Heise and MacKinnon 1987) also suggests, but does not test, that there are likely cognitive as well as affective components to consistency. In this paper, I set out to bridge this cognitive-affective divide. I draw on Schröder and Thagard’s (2013) work in the cognitive sciences to outline a model of the relationship between affect and cognition in schema-based processes, as well as their relationship to consistency bias, through the mechanism of deflection-reduction.
While Schröder and Thagard’s own extensive cognitive simulation-based tests provide support for their cognitive-affective model, I do not test it here. To improve our understanding of the relations between these processes, future research is needed to develop conceptual-level measures of cognitive schemas in order to test the contribution of each to the production of schema-consistency.

This study also contributes to an understanding of the cognitive portion of the affect control model—particularly with regards to definition-of-the-situation processes. Consistent with previous research (Nelson 2006), I find evidence of the stability of identities. When faced with culturally inconsistent, high-deflection statements, participants tended to reduce deflection by redefining behaviors or adding mood modifiers. Changes to identities were much less common. This suggests that identities play a key role in individuals’ initial definition of the situation and may be resistant to change even in the face of deflecting information. This finding has important implications for our understanding of stratification processes, particularly with regard to understanding the difficulties individuals face in attempting to overcome stigmatized identities on the one hand (Link and Phelan 2001) and the potentially protective powers of high-status identities on the other (Wahrman 2010). Future research should test whether this study’s findings hold for narratives centering on high-status individuals and narratives in other contexts with other stigmatized identities.

Finally, taken altogether, results from this study show that predictions from cultural cognition and affect control theory regarding actions and meaning maintenance apply not just to personal action but also to narrative construction in communication. Despite the crucial role of information transmission in all human interactions (Sperber 2011), the field of sociology has largely ignored cultural information transmission processes or (when it has addressed these
processes) has often assumed that transmission is complete and error-free (Lizardo 2015).

Results of this study show not only that information is prone to change as it is shared in communication but also that changes to information in transmission tend to be driven largely by cultural-consistency biases rather than purely random copying error. Although prior cultural transmission research (Sperber 1996; Kashima 2000; Sperber and Hirschfeld 2004; Mesoudi and Whiten 2008) indicates that copying error itself reflects schema-consistency bias, I am unable to test this claim here.

With this research, I hope to encourage future sociological work aimed at understanding cognitive and schematic processes contributing to systematic biases in information transmission. In this paper, I examine the effect one sort of cultural-consistency bias (affective consistency with shared cultural sentiments). One fruitful avenue for future research might be to examine the effects of subcultural variation in sentiments (Heise 2007) on polarization processes (Baldassarri and Bearman 2007) or frame resonance (Benford and Snow 2000).

Previous cultural transmission research finds that individuals are prone to schema-consistency bias in communication and that this bias often reinforces problematic cultural biases, such as stereotypes. This study provides an important first step toward understanding the impact of internalized cultural sentiments on information transmission. By helping sociologists understand the mechanisms involved in the cultural-consistency biases in information transmission, this and similar future research promises to improve our understanding of how cultural cognition and affect control principles may help construct culturally effective messaging aimed at overcoming such biases.
REFERENCES


Appendix A: Study Narrative

What follows is the study narrative. ABO events statements are followed by the resulting deflect information for that event (deflection information was not included in the narratives participants read).

A 27-year-old unemployed person, who has been chronically unemployed for the past few years, was recently apprehended in a local convenience store.

The unemployed person entered the store to borrow money from a customer (2.26) but then noticed a man attempting to shoplift some items. When he caught up to the shoplifter, the unemployed person counseled him to stop what he was doing (11.75). The shoplifter listened to the unemployed person (11.70) and then turned to leave and walked out of the store. The unemployed person applauded the shoplifter as he left (14.52), and then he finished his own shopping and went home.

When he returned the next day for some items he’d forgotten, the salesclerk immediately began to interrogate the unemployed person (2.87) about items he’d discovered were missing during inventory that morning. A mother accused the unemployed person of being the shoplifter she saw the day before (11.19). The unemployed person begged the salesclerk to believe he was innocent (1.51) and offered to help the salesclerk in the investigation (14.16). A passing grandmother harassed the unemployed person (12.76).

Just then a police officer arrived. The police officer questioned the unemployed person about the missing items (1.73). The unemployed person stammered at the police officer (2.26) as he educated the police officer about what had happened (12.99). The police officer silenced the unemployed person (1.98) and then proceeded to frisk the unemployed person (1.67). But then an employee intervened by verifying his account of the events.

The unemployed person then kissed the employee (12.27), and the employee said farewell to the unemployed person as he left the store (2.38). No other suspects have been apprehended in this investigation.
## Appendix B

### Table B1: Narrative Content Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Link 0 (Original)</th>
<th>Link 1</th>
<th>Link 2</th>
<th>Link 3</th>
<th>Link 4</th>
</tr>
</thead>
<tbody>
<tr>
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<td>--</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
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<tr>
<td>Avg. No. LD Used (Def &lt; 4.0)</td>
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<td>2.90</td>
<td>1.86</td>
<td>1.44</td>
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<td>2.76</td>
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<td>184</td>
<td>146</td>
<td>121</td>
<td>99</td>
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<td>Avg. Levenshtein Distance from Narrative in Link n-1</td>
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<td>659.16</td>
<td>487.04</td>
<td>398.54</td>
</tr>
<tr>
<td>Event from Original</td>
<td>Orig. HD v LD</td>
<td>% Included</td>
<td>% Included</td>
<td>% Included</td>
<td>% Included</td>
</tr>
<tr>
<td>Unemployed person, borrow money from, customer</td>
<td>LD</td>
<td>48%</td>
<td>32%</td>
<td>22%</td>
<td>12%</td>
</tr>
<tr>
<td>Unemployed person, counsel, shoplifter</td>
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<td>94%</td>
<td>84%</td>
<td>78%</td>
</tr>
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<td>12%</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>Unemployed person, applaud, shoplifter</td>
<td>HD</td>
<td>40%</td>
<td>20%</td>
<td>14%</td>
<td>8%</td>
</tr>
<tr>
<td>Salesclerk, interrogate, unemployed person</td>
<td>LD</td>
<td>86%</td>
<td>74%</td>
<td>62%</td>
<td>48%</td>
</tr>
<tr>
<td>Mother, accuse, unemployed person</td>
<td>HD</td>
<td>58%</td>
<td>38%</td>
<td>28%</td>
<td>24%</td>
</tr>
<tr>
<td>Unemployed person, beg, salesclerk</td>
<td>LD</td>
<td>58%</td>
<td>24%</td>
<td>22%</td>
<td>16%</td>
</tr>
<tr>
<td>Unemployed person, help, salesclerk</td>
<td>HD</td>
<td>30%</td>
<td>8%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>Grandmother, harass, unemployed person</td>
<td>HD</td>
<td>56%</td>
<td>34%</td>
<td>14%</td>
<td>8%</td>
</tr>
<tr>
<td>Police officer, question, unemployed person</td>
<td>LD</td>
<td>46%</td>
<td>24%</td>
<td>14%</td>
<td>8%</td>
</tr>
<tr>
<td>Unemployed person, stammer at, police officer</td>
<td>LD</td>
<td>26%</td>
<td>8%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>Unemployed person, educate, police officer</td>
<td>HD</td>
<td>56%</td>
<td>34%</td>
<td>14%</td>
<td>10%</td>
</tr>
<tr>
<td>Police officer, silence, unemployed person</td>
<td>LD</td>
<td>14%</td>
<td>4%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Police officer, frisk, unemployed person</td>
<td>LD</td>
<td>52%</td>
<td>28%</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>Unemployed person, kiss, employee</td>
<td>HD</td>
<td>82%</td>
<td>58%</td>
<td>54%</td>
<td>40%</td>
</tr>
<tr>
<td>Employee, say farewell to, unemployed person</td>
<td>LD</td>
<td>12%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
### TABLE 1: Paired $t$-Tests Comparing Average Deflection in Link $n$ to Link $n - 1$

<table>
<thead>
<tr>
<th>Link</th>
<th>Average Narrative Deflection</th>
<th>Average Difference from Narrative Received</th>
<th>$t$</th>
<th>df</th>
<th>$p$ (two-tailed tests)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original</td>
<td>9.331</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>1</td>
<td>6.563</td>
<td>-2.768</td>
<td>-19.08</td>
<td>49</td>
<td>0.000</td>
</tr>
<tr>
<td>2</td>
<td>5.820</td>
<td>-0.743</td>
<td>-3.79</td>
<td>49</td>
<td>0.000</td>
</tr>
<tr>
<td>3</td>
<td>5.391</td>
<td>-0.429</td>
<td>-1.97</td>
<td>49</td>
<td>0.054+</td>
</tr>
<tr>
<td>4</td>
<td>4.943</td>
<td>-0.448</td>
<td>-2.05</td>
<td>49</td>
<td>0.045</td>
</tr>
</tbody>
</table>

$+ p < .05$ (one-tailed test).
### TABLE 2: Multi-Level Linear Regressions of Levenshtein Distance on Participants’ Average Narrative Deflection and Average Change in Deflection from Narrative Received

<table>
<thead>
<tr>
<th></th>
<th>Average Narrative Deflection</th>
<th>Average Change in Deflection from Narrative Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levenshtein Distance (standardized)</td>
<td>−0.160 (0.170)</td>
<td>−0.028 (0.167)</td>
</tr>
<tr>
<td>Link 2</td>
<td>−0.950** (0.328)</td>
<td>1.988*** (0.352)</td>
</tr>
<tr>
<td>Link 3</td>
<td>−1.462*** (0.394)</td>
<td>2.288*** (0.411)</td>
</tr>
<tr>
<td>Link 4</td>
<td>−1.954*** (0.431)</td>
<td>2.26*** (0.446)</td>
</tr>
<tr>
<td>Constant</td>
<td>6.771*** (0.313)</td>
<td>−2.731*** (0.293)</td>
</tr>
<tr>
<td>n</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

Note: Standard errors are in parentheses. Link 1 = reference. Models are two-level models with participants nested within transmission chains; chain-level intercepts are not shown.

*p < .05, **p < .01, ***p < .001.
### TABLE 3: Examples of Commonly Used Deflection-Reducing Transformation Strategies

<table>
<thead>
<tr>
<th>Strategy Type (n = times used&lt;sup&gt;a&lt;/sup&gt;)</th>
<th>Original Event</th>
<th>Deflection</th>
<th>Example Transformation</th>
<th>Resulting Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Altering a Behavior</strong></td>
<td>Unemployed person, counsel, shoplifter</td>
<td>11.75</td>
<td>Unemployed person, <em>dissuade</em>, shoplifter</td>
<td>4.90</td>
</tr>
<tr>
<td><strong>n = 336</strong></td>
<td>Unemployed person, help, salesclerk</td>
<td>12.99</td>
<td>Unemployed person, <em>tell something to</em>, salesclerk</td>
<td>4.72</td>
</tr>
<tr>
<td></td>
<td>Unemployed person, educate, police officer</td>
<td>12.99</td>
<td>Unemployed person, <em>tell something to</em>, police officer</td>
<td>4.54</td>
</tr>
<tr>
<td></td>
<td>Shoplifter, listen to, unemployed person</td>
<td>11.70</td>
<td>Shoplifter, <em>agree with</em>, unemployed person</td>
<td>8.70</td>
</tr>
<tr>
<td><strong>Replacing Specific Identity with a General One</strong></td>
<td>Mother, accused, unemployed person</td>
<td>11.90</td>
<td><em>Woman</em>, accused, unemployed person</td>
<td>5.97</td>
</tr>
<tr>
<td><strong>n = 125</strong></td>
<td>Grandmother, harassed, unemployed person</td>
<td>12.76</td>
<td><em>Woman</em>, harass, unemployed person</td>
<td>7.84</td>
</tr>
<tr>
<td><strong>Reassigning an Action</strong></td>
<td>Unemployed person, applaud, shoplifter</td>
<td>14.52</td>
<td><em>Passerby</em>, applaud, shoplifter</td>
<td>9.63</td>
</tr>
<tr>
<td><strong>n = 51</strong></td>
<td>Mother, accused, unemployed person</td>
<td>11.90</td>
<td><em>Customer</em>, accused, unemployed person</td>
<td>5.78</td>
</tr>
<tr>
<td><strong>Mood Modification</strong></td>
<td>Unemployed person, kissed, employee</td>
<td>12.27</td>
<td><em>Happy</em> unemployed person, kissed, employee</td>
<td>7.06</td>
</tr>
<tr>
<td><strong>n = 36</strong></td>
<td>Unemployed person, kissed, employee</td>
<td>12.27</td>
<td><em>Thankful</em> unemployed person, kissed, employee</td>
<td>7.19</td>
</tr>
</tbody>
</table>

<sup>a</sup>Counts shown represent the number of events using this strategy, resulting in deflection-reduction. These categories are not mutually exclusive; for example, a participant might alter a behavior and use a generalized identity.

### TABLE 4: Paired t-Test Comparing Average Number of Low-Deflection (LD) versus High-Deflection (HD) Statements Participants Added, by Link Position

<table>
<thead>
<tr>
<th>Link</th>
<th>Mean LD</th>
<th>Mean HD</th>
<th>t</th>
<th>df</th>
<th>p (two-tailed tests)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link 1</td>
<td>.52</td>
<td>.30</td>
<td>1.85</td>
<td>49</td>
<td>.070</td>
</tr>
<tr>
<td>Link 2</td>
<td>.68</td>
<td>.28</td>
<td>2.80</td>
<td>49</td>
<td>.007</td>
</tr>
<tr>
<td>Link 3</td>
<td>.70</td>
<td>.16</td>
<td>4.31</td>
<td>49</td>
<td>.000</td>
</tr>
<tr>
<td>Link 4</td>
<td>.48</td>
<td>.08</td>
<td>3.50</td>
<td>49</td>
<td>.001</td>
</tr>
</tbody>
</table>
FIGURE 1

Mean Cultural Consistency Ratings for Event Statements from Pretest
(Ordered from Highest to Lowest Deflection)

<table>
<thead>
<tr>
<th>Event Statement</th>
<th>Mean Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>The unemployed person applauded the shoplifter</td>
<td>14.52</td>
</tr>
<tr>
<td>The unemployed person offered to help the salesclerk</td>
<td>14.16</td>
</tr>
<tr>
<td>The employee rescued the unemployed person</td>
<td>13.2</td>
</tr>
<tr>
<td>The unemployed person educated the police officer</td>
<td>12.99</td>
</tr>
<tr>
<td>A grandmother harassed the unemployed person</td>
<td>12.76</td>
</tr>
<tr>
<td>The customer heaped abuse on the unemployed person</td>
<td>12.49</td>
</tr>
<tr>
<td>The unemployed person kissed the employee</td>
<td>12.37</td>
</tr>
<tr>
<td>The unemployed person counseled the shoplifter</td>
<td>11.75</td>
</tr>
<tr>
<td>The shoplifter listened to the unemployed person</td>
<td>11.7</td>
</tr>
<tr>
<td>A mother accused the unemployed person</td>
<td>11.19</td>
</tr>
<tr>
<td>The shoplifter left the unemployed person</td>
<td>2.96</td>
</tr>
<tr>
<td>The salesclerk began to interrogate the unemployed person</td>
<td>2.87</td>
</tr>
<tr>
<td>The unemployed person followed the shoplifter</td>
<td>2.64</td>
</tr>
<tr>
<td>The employee said farewell to the unemployed person</td>
<td>2.38</td>
</tr>
<tr>
<td>The unemployed person stammered at the police officer</td>
<td>2.26</td>
</tr>
<tr>
<td>The unemployed person entered the store to borrow money from the customer</td>
<td>2.26</td>
</tr>
<tr>
<td>The police officer silenced the unemployed person</td>
<td>1.98</td>
</tr>
<tr>
<td>The police officer questioned the unemployed person</td>
<td>1.73</td>
</tr>
<tr>
<td>The police officer frisked the unemployed person</td>
<td>1.67</td>
</tr>
<tr>
<td>The unemployed person begged the salesclerk</td>
<td>1.51</td>
</tr>
</tbody>
</table>

Mean Consistency
FIGURE 2

Average Number of Low- and High-Deflection Events Used
(Maintained + Transformed + Added)
by Participants, across Link Positions

Statements

Original 1 2 3 4
Link

Low-Deflection, Used
High Deflection, Used
Average Number of Low– and High–Deflection Events Maintained and Included (Maintained + Transformed) by Participants from Original Narrative, across Link Positions
FIGURE 4

Statements' Predicted Probability of being Maintained, Transformed, or Included (Maintained or Transformed, rather than Lost) in Link n by Deflection in Link n−1
The black reference line denotes no change in deflection. Dots above the line represent an increase in deflection compared with the original statement, and those below the line represent a decrease in deflection.
FIGURE 6

Transformed Statements' Predicted Change in Deflection by Deflection in Link n-1 and Link Position
ENDNOTES:

1 The use of the term “construct” in this sense is not meant to imply active, conscious construction.

2 Because extensive treatment of affect control theory and its associated research methods is available in a number of published resources, I provide only an overview here. For a comprehensive treatment of affect control theory and its methods, see Heise (2007, 2010).

3 Affect control theory uses a culture-as-consensus approach (Romney, Weller, and Batchelder 1986; Heise 2010). Cultural responses to survey items (here, affective meaning ratings) are represented by the central response tendency among individuals sampled from a single culture.

4 Data on cultural sentiments regarding the identities and behaviors used in the examples here and in the study were drawn from the 2003 sentiment dictionary (unisex version) collected by Francis and Heise at Indiana University. The study involved a sample of 1,027 Indiana University students, all of whom had been U.S. residents since age 16 (to ensure familiarity with U.S. culture and cultural sentiments).

5 Because the theory posits that all actors are driven to confirm shared fundamental sentiment meanings in interaction, low-deflection events should be more likely to occur (Schröder and Scholl 2009) and to be perceived as more likely than high-deflection events (Heise and MacKinnon 1987; MacKinnon 1994). This produces an inverse correlation between deflection and perceived likelihood, although this relationship is not perfect.
6 A recently developed Bayesian model of affect control theory (BayesACT; see Schröder, Hoey, and Rogers forthcoming), relaxes this labeling assumption and instead models identities as probabilistic beliefs (rather than mean point estimates).

7 “Concept elements” are abstractions used for modeling purposes, given that biologically, any given concept is encoded in a pattern of activation across many neurons.

8 For a detailed description of these models, see Kunda and Thagard (1996) or Thagard (2012).

9 This theory, therefore, cannot speak to (a) (the production of) schema-consistency bias in information not containing an interaction event (e.g., an action without object, or general descriptive information about a person outside the context of an interaction event), (b) interactions an individual has noted in passing but has not taken time or effort to label, or (c) cross-language/cross-cultural interactions.

10 Smith-Lovin and Robinson (2015) found a slight shift in affective meanings associated with the unemployed person identity after the 2007–2009 recession (E = −0.55, P = −2.12, A = −1.16). This shift represents just under a 1-point increase in its evaluation rating, but the identity remains negatively evaluated. Substituting this new unemployed person rating in the original study events resulted in small shifts in deflection scores (generally within 2 points); however, initially low-deflection events continued to have deflection scores in the lower quartile of initially simulated event deflections, and initially high-deflection events maintained scores in the upper quartile.
Interact, a computer program that David Heise created for simulating affect control theory events using the theory’s impression formation equations, may be downloaded at no cost here: http://www.indiana.edu/~socpsy/ACT/interact.htm

Analyses including versus excluding these four participants yielded the same substantive results; differences in estimates of (1) correlation between cultural-consistency rating and deflection and (2) mean cultural-consistency ratings for high- and low-deflection events including versus excluding the four non-U.S.-born participants were all less than 0.1. Differences in mean cultural consistency ratings for each of the 20 statements pretested including versus excluding these participants were all less than .12 (on 5-point scale). However, because t-tests showed that these participants differed significantly from U.S.-born participants on ratings of 3 of 20 statements, I excluded them here.

This ratings method is modeled on that traditionally used to assess statement consistency in previous transmission studies (Kashima and Yeung 2010). In addition to these statements of interest, I included three active participation-check statements with specific instructions throughout this portion of the pretest. The final data include only those participants who passed the active participation checks, indicating that they were reading and following study instructions rather than rating statements randomly. This procedure eliminated data from eight participants. As an additional data quality check, I conducted a consensus analysis (Romney et al. 1986) of participants’ ratings to assess between-participant consistency in response patterns. Results indicate that there is sufficient agreement among raters to indicate that responses were drawn from a shared culture.
This variation may be due to subcultural variation in the meanings of one or more terms in these events, or may be due to denotative differences in interpretations of one or more terms. For example, “the unemployed person followed the shoplifter” could be interpreted as “the unemployed person tailed the shoplifter” or “the unemployed person went with the shoplifter.”

I included this instruction here (and in the retell step below) to discourage implicit redefinition of events in which participants perceive or reinterpret an event one way but feel constrained by the experimental task to provide an exact retelling.

In this distracter task, participants were instructed to use a pool of 10 letters to create as many word combinations of four or more letters as possible in five minutes. Participants were not allowed to advance in the study until the five minutes had passed.

Additionally, I coded non–Actor-Behavior-Object introductory and transitional statements from the original narrative as maintained if the main idea or gist of the original statement was present in the respondent produced narrative. Otherwise, I coded them as lost. Any novel non–ABO statements and ABO statements that became non–ABO statements were coded as added. However, the analyses focus on ABO event statements only because of the study’s focus on the relationship between deflection and transmission.

Twenty-seven statements initially coded as transformed were translated back into the original Actor-Behavior-Object event statement as the original statement terms were closest match in the
study sentiment dictionary for the terms used by participants. I do not include those statements here but instead treat them as maintained statements.

19 Statement pretest participants were not permitted to participate in the final study.

20 Calculated as the sum of deflections of all event statements the participant used divided by the number of event statements the participant used.

21 Analyses used multi-level Poisson models (with individuals nested within chains, and with random intercepts at the chain level) for counts of statements by deflection level. Participants who had a recent experience with unemployment (either directly or through a close friend/family member) included slightly more high-deflection transformed statements; however, these statements represented a very small number of transformed statements, and these participants did not differ significantly from other participants in the final total number of high- and low-deflection statements they used.

22 I calculated this variable using Stata’s strdist command (author M. Barker) and standardized it for ease of interpretation.

23 To construct the predictor and outcome variables, I limit these analyses to statements included in two consecutive links of a transmission chain.

24 I conduct similar analyses for behavior transformations, the most common type of event transformation. Results of these analyses similarly show that deflection, but not level of random
error (as measured by Levenshtein distance), is associated with transformation from the original behavior to a new one. (See Online Appendix for the table of results.)

25 General identity substitution would not inevitably decrease deflection regardless of event context. General identities, although often less strongly valenced than the identities they replaced, were not inherently more neutral, which would be required to produce an overall trend of deflection-reduction in the case of unmotivated shifts toward general identities. For instance, “woman” and “lady” are fairly good (E = 1.89 and E = 2.56, respectively), and “man” and “guy” are fairly powerful (P = 1.76 and P = 1.70, respectively).
ONLINE APPENDIX – Additional Results
Multi-Level Logistic Regression Models Predicting Statement Maintenance/Transformation/Inclusion in Link $n$ by Deflection in Link $n-1$

(Models results shown in Figure 4 of the main document)

<table>
<thead>
<tr>
<th></th>
<th>1 Included</th>
<th>2\textsuperscript{a} Included</th>
<th>5 Transformed</th>
<th>6\textsuperscript{a} Transformed</th>
<th>9 Maintained</th>
<th>10\textsuperscript{a} Maintained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deflection in Link $n-1$</td>
<td>0.0385*** (0.011)</td>
<td>0.465*** (0.072)</td>
<td>0.0330** (0.011)</td>
<td>0.813*** (0.078)</td>
<td>0.00906 (0.014)</td>
<td>-0.487*** (0.092)</td>
</tr>
<tr>
<td>Deflection in Link $n-1$, squared</td>
<td>-0.0283*** (0.005)</td>
<td>-0.0521*** (0.005)</td>
<td>-</td>
<td>-</td>
<td>-0.0326*** (0.006)</td>
<td></td>
</tr>
<tr>
<td>Link 2</td>
<td>0.377* (0.174)</td>
<td>0.131 (0.183)</td>
<td>0.653*** (0.135)</td>
<td>0.191 (0.149)</td>
<td>-0.568** (0.193)</td>
<td>-0.335 (0.208)</td>
</tr>
<tr>
<td>Link 3</td>
<td>0.745*** (0.197)</td>
<td>0.406 (0.209)</td>
<td>1.153*** (0.156)</td>
<td>0.540** (0.176)</td>
<td>-0.884*** (0.245)</td>
<td>-0.560* (0.261)</td>
</tr>
<tr>
<td>Link 4</td>
<td>1.011*** (0.222)</td>
<td>0.604* (0.235)</td>
<td>1.459*** (0.179)</td>
<td>0.745*** (0.200)</td>
<td>-1.181*** (0.301)</td>
<td>-0.755* (0.319)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.287* (0.137)</td>
<td>-1.077*** (0.191)</td>
<td>-1.187*** (0.122)</td>
<td>-2.656*** (0.195)</td>
<td>-1.476*** (0.172)</td>
<td>-0.552* (0.239)</td>
</tr>
<tr>
<td>$n$</td>
<td>1,625</td>
<td>1,625</td>
<td>1,625</td>
<td>1,625</td>
<td>1,625</td>
<td>1,625</td>
</tr>
<tr>
<td>BIC</td>
<td>2,202.2</td>
<td>2,171.3</td>
<td>2,118.8</td>
<td>2,007.3</td>
<td>1,474.3</td>
<td>1,450.5</td>
</tr>
</tbody>
</table>

Notes: Standard errors are in parentheses. Link 1 = reference. Observations are restricted to statements that were included in link $n-1$. Models are three-level models with statements nested within participants nested within transmission chains. Chain-level and participant-level intercepts are not shown.

\textsuperscript{a}Model displayed in graphical results in manuscript

*p < .05, **p < .01, ***p < .001.
Results of *t*-Tests Comparing Average New Deflection and Average Change in Deflection from Original Statement Resulting from Observed versus Random Statement Transformations

(Tests discussed on pp 29-30)

<table>
<thead>
<tr>
<th>New Deflection</th>
<th>Comparison Group</th>
<th>Observed</th>
<th>Random</th>
<th><em>t</em></th>
<th>df</th>
<th><em>p</em> (two-tailed tests)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>5.725</td>
<td>6.202</td>
<td>−2.608</td>
<td>1,678</td>
<td>.009</td>
</tr>
<tr>
<td></td>
<td>Originally LD</td>
<td>3.847</td>
<td>4.501</td>
<td>−3.35</td>
<td>715</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>Originally HD</td>
<td>6.737</td>
<td>7.766</td>
<td>−4.109</td>
<td>961</td>
<td>.000</td>
</tr>
<tr>
<td>Change from Original</td>
<td>Comparison Group</td>
<td>Observed</td>
<td>Random</td>
<td><em>t</em></td>
<td>df</td>
<td><em>p</em> (two-tailed tests)</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>−3.04</td>
<td>−1.363</td>
<td>−6.977</td>
<td>1,678</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Originally LD</td>
<td>1.475</td>
<td>2.419</td>
<td>−4.737</td>
<td>715</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Originally HD</td>
<td>−5.475</td>
<td>−4.839</td>
<td>−2.554</td>
<td>961</td>
<td>.011</td>
</tr>
</tbody>
</table>
Distribution of Change in Deflection (Deflection in Link \(n\) – Deflection in Link \(n-1\)) by Link and Deflection Level in Link \(n-1\)

(Referenced on pp 31)
Multi-Level Linear Regression Models Predicting Change in Deflection Resulting from Statement Transformations, by Link Position

(Models results shown in Figure 6 of the main manuscript)

<table>
<thead>
<tr>
<th></th>
<th>Link 1</th>
<th>Link 2</th>
<th>Link 3</th>
<th>Link 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deflection in Link $n - 1$</td>
<td>$-0.608^{***}$ (0.038)</td>
<td>$-0.447^{***}$ (0.050)</td>
<td>$-0.427^{***}$ (0.064)</td>
<td>$-0.116$ (0.091)</td>
</tr>
<tr>
<td>Constant</td>
<td>$2.814^{***}$ (0.379)</td>
<td>$2.204^{***}$ (0.332)</td>
<td>$2.198^{***}$ (0.382)</td>
<td>$0.635$ (0.518)</td>
</tr>
<tr>
<td>$n$</td>
<td>226</td>
<td>133</td>
<td>118</td>
<td>103</td>
</tr>
</tbody>
</table>

Notes: Standard errors are in parentheses. Observations are restricted to transformed statements that were included in link $n - 1$. Models are three-level models with statements nested within participants nested within transmission chains; chain-level and participant-level intercepts are not shown.

*p < .05, **p < .01, ***p < .001.
### Multi-Level Logistic Regression Model Predicting Likelihood of Statement Transformation from Specific to General Identity and from Original to New Behavior by Levenshtein Distance and Deflection in Link \( n - 1 \)

(Model results discussed in manuscript, pp 32-33 and Endnote 24 pp 63)

<table>
<thead>
<tr>
<th></th>
<th>Transformations from Specific to General Identity</th>
<th>Transformations from Specific to General Identity</th>
<th>Transformations from Original to New Behavior</th>
<th>Transformations from Original to New Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levenshtein Distance (standardized)</td>
<td>0.374 (0.282)</td>
<td>0.374 (0.282)</td>
<td>-0.080 (0.191)</td>
<td>-0.074 (0.193)</td>
</tr>
<tr>
<td>Deflection in Link ( n - 1 ) (continuous)</td>
<td>0.081** (0.028)</td>
<td>—</td>
<td>0.044** (0.0151)</td>
<td>—</td>
</tr>
<tr>
<td>High Deflection in Link ( n - 1 ) (binary)</td>
<td>—</td>
<td>0.757** (0.268)</td>
<td>—</td>
<td>0.540** (0.161)</td>
</tr>
<tr>
<td>Link 2</td>
<td>1.602** (0.556)</td>
<td>1.646** (0.557)</td>
<td>-1.378*** (0.357)</td>
<td>-1.363*** (0.358)</td>
</tr>
<tr>
<td>Link 3</td>
<td>1.803** (0.676)</td>
<td>1.884** (0.681)</td>
<td>-1.466** (0.513)</td>
<td>-1.415** (0.514)</td>
</tr>
<tr>
<td>Link 4</td>
<td>2.094** (0.766)</td>
<td>2.215** (0.774)</td>
<td>-1.683* (0.655)</td>
<td>-1.613* (0.659)</td>
</tr>
<tr>
<td>Constant</td>
<td>-5.314*** (0.618)</td>
<td>-5.075*** (0.584)</td>
<td>-1.530*** (0.300)</td>
<td>-1.489*** (0.291)</td>
</tr>
<tr>
<td>( n )</td>
<td>1,513</td>
<td>1,513</td>
<td>1,203</td>
<td>1,203</td>
</tr>
</tbody>
</table>

**Notes:** Standard errors are in parentheses. Link 1 = reference. Observations are restricted to statements that were included in link \( n - 1 \) and version used in \( n - 1 \) did not already use the transformation strategy being predicted. Models are three-level models with statements nested within participants nested within transmission chains; chain-level and participant-level intercepts are not shown. *\( p < .05 \), **\( p < .01 \), ***\( p < .001 \).