Dynamic Social Impact: A Theory of the Origins and Evolution of Culture

Helen C. Harton* and Melinda Bullock
University of Northern Iowa

Abstract

Dynamic social impact theory suggests that culture is created and shaped by local social influence as defined by four phenomena: (i) clustering, or regional differences in cultural elements; (ii) correlation, or emergent associations between elements; (iii) consolidation, or a reduction in variance; and (iv) continuing diversity. This article describes dynamic social impact theory and its propositions and reviews research supporting its predictions using a variety of methodologies and several types of cultural elements. This research suggests that cultures can be created and changed from the bottom-up through everyday communication with neighbors, friends, and coworkers. Attributes that are more important, observable, and demonstrable and less heritable may be more likely to spread and differentiate cultures than others.

After decades of a social psychology focused largely on middle-class white Americans, psychologists are increasingly concerned with how cultural differences (especially Eastern versus Western) affect the way people think and behave. For example, in comparison to members of Western cultures, members of Eastern cultures tend to describe people and groups more actively (Kashima, Kashima, Kim, & Gelfand, 2006), express more group-oriented emotions (Kitayama, Mesquita, & Karasawa, 2006), use more holistic reasoning (Nisbett, Peng, Choi, & Norenzayan, 2001) and focus to a greater extent on the situation (Miyamoto, Nisbett, & Masuda, 2006).

But where did these differences come from initially? Dynamic social impact theory (DSIT) was one of the first theories to address this issue (Latané, 1996a; Nowak, Szamrej, & Latané, 1990). This theory posits that when people living in spatially distributed groups (groups where people do not have equal access to everyone else for geographic or other reasons) communicate with each other over time, four phenomena, or markers of culture will evolve. These are (i) clustering (regional differences in attitudes and behaviors); (ii) correlation (associations between once unrelated attitudes and behaviors); (iii) consolidation (a reduction in diversity of attitude and behaviors); and (iv) continuing diversity (whereby despite this reduction in diversity, unanimity does not result).

Stated more simply, DSIT proposes that culture is created from the bottom-up through everyday communication between people. 'Communication' refers to any of the countless ways people get across their beliefs, attitudes, preferences, and behaviors to others. This communication can be verbal (a conversation) or behavioral (putting a lawn statue in one's yard). It can be purposeful (an argument to convince someone else) or incidental (a Southern accent). This communication is also spatially dependent. People have a larger number of interactions with and greater influence on those who live closer to them (Cullum & Harton, 2007; Festinger, Schachter, & Back, 1950; Latané, Liu, Nowak, Bonevento, & Zheng, 1995; Newcomb, 1943).

This proximity effect leads to regional differences in cultural elements. As people influence each other on these different elements, they come to be related to each other, and 'cultures' are formed. These cultures change over time, with more popular elements of the culture (those held by a greater number of people) expanding at the expense of less popular elements. This process simultaneously results in cultural differences at various levels – from region of the world to country, state, and neighborhood.

DSIT grew out of social impact theory (SIT), Latané's (1981) earlier theory of social influence. According to SIT, social impact is the amount of social influence individuals have on one another and is a multiplicative function of strength (elements that make a person more persuasive or better able to resist persuasion, such as expertise, physical attractiveness, or personality), immediacy, and number. Immediacy is defined as closeness in social space. Social space is constrained by physical space (Latané & Liu, 1996; Nowak, Latané, & Lewenstein, 1994), but not completely equivalent to it. For example, in an apartment building, a person may be more immediate to a downstairs neighbor (Bob), than one who lives beside him (Joe), if the person passes by Bob's but not Joe's apartment every day on his way out of the building. Influence declines exponentially as social space increases (Latané et al., 1995). Number is the number of people doing the influencing or being influenced, and is also a power function. Each additional person adds a little less unique influence. You will be more influenced by two people arguing a position than one person, but the 301st person probably will not have much influence beyond the 300th.

SIT has been well supported by studies examining a variety of types of influence situations. High strength persuaders, operationalized in terms of status (Williams & Williams, 1983), expertise (Wolf & Latané, 1983), or dress (Jackson & Latané, 1981a; Sedikides & Jackson, 1990; Williams & Williams, 1989) are more influential than lower strength persuaders. Immediacy also has an effect on influence. Zoo visitors comply more readily to requests made by an experimenter who is physically closer to them than to one in another room (Sedikides & Jackson, 1990), and people in the USA and China report more influence from those who

live closest to them (Latané et al., 1995). Number has received the most empirical attention, likely due to its easy manipulation. The number of people endorsing a particular restaurant choice (Wolf & Latané), donating money to cancer research (Jackson & Latané, 1981a), or choosing one answer over another (Asch, 1955) affect social influence. These factors also seem to combine multiplicatively as the theory suggests (e.g. Jackson & Latané, 1981a, b; Latané & Harkins, 1976; Wolf & Latané).

SIT is a static theory, however, predicting influence on one element at a time and from one person or group to another. In reality, of course, influence is reciprocal (you influence me as I influence you) and recursive (we continue to influence one another on a variety of issues over time). Hence, what happens when people repeatedly influence each other? Nowak et al. (1990) created a computer simulation program to find out. The simulations, across different group sizes and distributions, programming languages, and formulae (Harton, 1998; Latané & Bourgeois, 2001b; Latané & Nowak, 1997; Latané, Nowak, & Liu, 1994; Nowak & Latané, 1994), showed consistent effects. As people influence each other in spatially distributed groups in proportion to their strength, immediacy, and number, their characteristics (e.g. beliefs, attitudes, habits, behaviors) self-organized, showing the four phenomena described above: clustering, correlation, consolidation, and continuing diversity.

Consider two elements that define cultures – religion and food preferences. Obviously, there are Eastern versus Western differences in these elements, but there are also regional differences within the USA (e.g. Southern USA versus Midwestern USA). Within Christian denominations, Baptists are concentrated at higher levels in the Southeastern USA, whereas Lutherans are predominate in the upper Midwest (Kilpinen, 2004). Similarly, grits, biscuits, and sweet tea are much more popular in the Southern states, while Midwesterners love fried pork tenderloin sandwiches, potato salad, and sweet corn. These preferences may be due in part to geographical constraints (e.g. types of food grown in different areas), but they are also socially influenced. If everyone around you loves sweet tea and keeps offering it to you, you may come to try and like it yourself.

Because people influence and are influenced by those around them simultaneously on different elements, these elements come to be associated or correlated with one another. If you know that someone loves pork tenderloin sandwiches, you could make a reasonable guess that she might be Lutheran. These associations are not necessarily logical – there is no reason why Lutherans should eat deep fried pork more often than Baptists – but they come about simply as a result of elements clumping together via clustering.

Religious denominations and food preferences also show consolidation and continuing diversity. From 1952 to 1990 the Southern Baptist convention grew 133%, while the Lutheran churches grew only 13% (Newman & Halvorson, 2000). Other smaller denominations have shrunk (e.g.

Presbyterian) even in the face of large growths in the US population. Likewise, food preferences wax and wane. For example, grits have grown in popularity and become more 'gourmet' over the past few years (North Carolina Department of Commerce, 2007).

If you've lived in different regions of the USA or other countries, you've no doubt recognized these types of cultural differences yourself. In North Carolina, you might 'carry' someone to buy 'coke', which is put in a 'bag'. In Iowa, I would 'take' someone to buy 'pop', which is put in a 'sack'. There are myriad other cultural examples that show the predictions of DSIT, from accents (Harton & Bourgeois, 2004), life satisfaction (Plaut, Markus, & Lachman, 2002), and responses to violence (Vandello & Cohen, 2004) to music and television preferences (Harton, 2005; Weiss, 1994), dog ownership (Harton, 2005; Weiss), responses to direct mail (Harton & Latané, 1997a; Weiss), and what time to show up at a party or wear to a wedding.

Simply showing that existing cultural elements are self-organized provides some indirect support for DSIT, but it does not necessarily show that these differences could have emerged via everyday communication. To do that, researchers have used experimental studies to create 'subcultures' in short periods of time in the laboratory and surveyed participants who live in interacting communities over time.

What Evidence Is There for the Emergence of Culture from Communication?

Clustering

Clustering refers to regional differences in attitudes and behaviors and is the most robust prediction of DSIT, having been shown consistently in computer-mediated studies, face-to-face discussions, and field studies. As people influence those closest to them, they will come to be more similar to them than those further away, resulting in spatial distributions of cultural elements.

In some of the earliest tests of clustering, participants were randomly assigned a location in a social space where they could communicate with only 4 members (their 'closest neighbors') in a 24-person interconnected group. Participants indicated their preferences on a variety of types of topics, sometimes with a short rationale, and then read the responses of their 'neighbors' in the next round, for five rounds of communication across 2.5 weeks. Different communication geometries modeled the types of communication patterns people may have in the real world (e.g. Latané & L'Herrou, 1996).

Initially, people's preferences were randomly distributed, as would be expected. After communication, however, clustering of attitudes emerged in virtually every group for every type of issue tested. In the first studies

(Latané & L'Herrou, 1996; Latané & Bourgeois, 1996), participants chose between two arbitrary choices (e.g. red or blue). They were monetarily rewarded for each issue on which they could guess the majority viewpoint of their 24-person group. Despite this incentive for unanimity, clustering still emerged. Because participants could only communicate with a subset of their group members directly, they often thought they were in the majority when in fact they were in a global minority, resulting in an incorrect vision of the 'majority' opinion. In these studies, however, participants were just picking choices arbitrarily; they were not giving their opinions, hence, it could be argued that when actual opinions were involved, attitudes might not cluster. But other studies using this paradigm consistently found clustering when participants 'discussed' legal decisions (Jackson, Bourgeois, & Latané, 2002), attitudes (Latané & Bourgeois, 2001a; Richardson & Latané, 2001), and even their own personalities (Latané & Bourgeois, 2001a**)**. Behaviors were impacted too; participants in one version chose to give 50 cents or take $1 from each of their 'neighbors', for five rounds, and choices were communicated to each neighbor every time. Behavior in this social dilemma clustered over time, as regions of 'givers' and 'takers' emerged (Latané & Bourgeois, 2001a).

In the studies mentioned thus far, participants were limited in their communication, usually to two lines of text for each issue per round. In other studies, participants chatted for longer periods of time with subsets of a larger group using a computer chat program. Once again, clustering consistently emerged on discussions of social (Binder, Russell, Sievers, & Harton, 2001; Okdie, 2007; Okdie, Wren, & Harton, 2006) and school issues (Bullock, Okdie, & Harton, 2007).

Face-to-face communication paradigms have shown similar results. In these paradigms, participants typically give their opinions on items, then discuss some items with those seated next to them before responding privately again. In contrast to studies of discrete groups (e.g. Sherif, 1935), these participants communicated directly with only two group members, who, in turn, communicated with other members, modeling the case in the 'real world' where we have contact with some people who, in turn, have contact with others we may not know. Students in one study who discussed quiz questions for only 1 minute each with those seated to their left and right became more similar to those with whom they discussed the items (Harton, Green, Jackson, & Latané, 1998). Despite the inter-connections of large number of students, the proportion of correct answers did not necessarily increase over time, and there were clear regional differences in beliefs about the correct answer (Harton et al., 1998). There is also clustering after face-to-face discussion on opinion items; estimates of temperature, line length, and future event likelihoods; easy and difficult math problems; and questions with a demonstrably correct answer (aka 'eureka' problems; Harton, Eshbaugh, & Binder,

2006). Even social scientists are not immune to these effects; spatially distributed groups of social psychologists discussing analogies at conferences also show clustering of opinions (Harton, Green, Jackson, & Latané, 1996).

In these computer and face-to-face paradigms, however, who people discuss issues with and how long those discussions occur are controlled. What happens in the 'real world'? Do people still disproportionately influence those who live closest to them? College students who interact with each other more frequently because they share group memberships (sororities; Crandall, 1988) or major (Guimond & Palmer, 1996b) become more similar in attitudes and behaviors over time. But to what extent does social space – where the students live – affect this process? In line with classic findings showing that people interact more with and become influenced by those who live closer to them (e.g. Festinger et al., 1950; Newcomb, 1943), Bourgeois and Bowen (2001) found that students' end-of-year alcohol-related attitudes and behaviors were more similar to those who lived on their floor than to those in other parts of the residence hall.

To address to what extent these differences may be due to social influence rather than selection (e.g. choosing to live with like-minded others), Cullum and Harton (2007) conducted a more elaborate longitudinal survey of students living in four residence halls across an entire semester. Residents interacted with and befriended those in their 'house' (part of a floor) to a greater extent than those who lived in other houses or off campus, even when these initial room assignments were made randomly. As a result, clustering increased significantly for a variety of issues (e.g. premarital cohabitation, the war in Iraq) from the beginning to the end of the fall semester (Cullum & Harton, 2007). This influence occurred for attitudes as well as behaviors, and increased further at a posttest at the end of the school year (Cullum & Harton, 2006).

Clustering can emerge on issues even when people do not verbally communicate their attitudes. In the field studies cited above, clustering occurred independent of any planned discussions. Participants were not required, or even asked, to discuss the issues assessed, and in fact, self-reported discussion levels for many of the issues were fairly low (Cullum & Harton, 2007). Information about whether one believes that campus is safe can be communicated by actions and responses to others at least as much as by one's verbal comments. Attitudes may also cluster simply because of their relationship with other attitudes that are discussed (Binder & Bourgeois, 2006).

Correlation

Correlation refers to the emergent associations between elements over time. As clustering develops on a number of attributes, these attributes

come to be correlated with one another (Abelson, 1979; Latané, 1996b). These correlations are due at least in part to a loss of independence due to clustering. That is, when clusters emerge, individuals essentially begin to form groups, and these 'group' attitudes tend to overlap with group attitudes on other issues. It is these correlations, DSIT proposes, that result in what is considered a 'culture'.

Correlation has been found in all the DSIT paradigms. Computer-mediated studies have shown increases in both magnitude of correlations and number of significant correlations from pre- to post-discussion (Latané & Bourgeois, 1996, 2001a). Similarly, answers in the face-to-face discussions of quiz answers became associated over time. Although the items themselves were not directly related, people who thought the answer to the first question was A, for example, were also likely to think that the answer to the next question was C (regardless of the correct answer; Harton et al., 1998). Field studies of college students have shown this as well. Attitudes toward issues such as fraternities/sororities, the legalization of marijuana, unions, and human cloning become increasingly related to each other over time as a result of the similarities that develop through clustering (Cullum & Harton, 2007; Guimond & Palmer, 1996b; see also Finney, 1974; Guimond & Palmer, 1996a).

Correlation can emerge as a result of individuals becoming more similar to one another, but it can also emerge because participants' own repre-sentations of the issues become more similar to one another (Lavine & Latané, 1996). In one study, participants who discussed a subset of human rights issues developed more coherent factor structures of the entire list of human rights issues after discussion. Furthermore, these factor structures differed by group, suggesting that the content of the individual discussions, rather than just thinking about the issues alone, led to these changes (Huguet, Latané, & Bourgeois, 1998). Another longitudinal study showed not only that college students' attributions about poverty and attitudes toward social groups became more intercorrelated after 2 years of college, but that the interrelationships between the issues differed for social science versus commerce students. At least part of these changes seemed to be due to the influence of professors and courses on students' thinking about issues (Guimond & Palmer, 1996b). People's attitudes converge not just on discussed issues, but also on those that are related to them (Binder & Bourgeois, 2006), further supporting cognitive reorganization as a process for correlation.

Consolidation and continuing diversity

Whereas clustering and correlation address what a culture is, consolidation and continuing diversity address how cultures change. Consolidation is essentially a tendency toward majority influence. In general, as a result of

minorities being more exposed to majority viewpoints than vice versa, the size of the majority will increase over time. However, because the spatial distribution of communication 'protects' some minority viewpoints from influence, there is rarely a complete obliteration of the minority, resulting in continuing diversity.

Support for consolidation comes from the electronic and face-to-face DSIT paradigms. The number of group members holding minority opinions over time decreased for preferences (Latané & Bourgeois, 1996; Latané & L'Herrou, 1996), attitudes (Binder et al., 2001; Jackson et al., 2002; Latané & Bourgeois, 2001a; Okdie, 2007), and behaviors (Latané & Bourgeois, 2001a) in electronic groups. Overall, seven of the eight face-to-face discussion groups examined by Harton et al. (1998) showed decreased opinion diversity after discussion as well.

However, consolidation does seem to be more subject to initial conditions than clustering or correlation, and DSIT does not predict that it will always occur. Consolidation occurs regularly in small discrete groups as long as there is an initial majority (Binder & Bourgeois, 2006; Conway, 2004). In spatially distributed groups, it often depends on how much minority opinion holders are exposed to majority positions. In cases where, because of the communication pattern and/or distribution of attitudes, people are able to maintain a belief that they are in a global majority even when it is only a local one, consolidation will be limited. Several studies have found limited evidence of consolidation in at least some conditions (Cullum & Harton, 2007; Huguet et al., 1998, Latané & L'Herrou, 1996).

Whether attributes consolidate or not, there is a strong tendency toward continuing diversity. Computer simulations show that this persistence of minority attributes is a stable outcome of the assumptions of DSIT (Latané & Nowak, 1997; Nowak et al., 1990). In face-to-face (Harton et al., 1998, 2006) and electronic (Binder et al., 2001; Bullock, 2007; Jackson et al., 2002; Latané & Bourgeois, 1996, 2001a; Okdie, 2007) studies, as long as the majority is not larger than 66%, the minority, while potentially reduced, does not generally disappear. Even when people are paid in computer games to agree with the majority, about a fourth of them still chose minority positions – a reasonable decision, as most of the people they communicate with agree with them, making them appear to be in the majority (Latané & L'Herrou, 1996).

DSIT also suggests that there are times when the initial minority will actually become a majority. In contrast to some other theories (e.g. Moscovici, 1985), DSIT posits that majority and minority influence occur via the same processes (Latané, 1996b; Latané & Wolf, 1981). When minorities are particularly high in strength, seem to have 'truth' on their side, or are protected geographically or by selective isolation from majority viewpoints, they may be more likely to retain their numbers and even grow (Harton & Bourgeois, 2004; Latané, 1996b). Groups such as the

Amish and ultraorthodox Jews maintain their culture by eschewing the outside culture. Even more mainline Christian denominations spread to a greater extent when they isolate themselves from progressive ideas (Blau, Redding, & Land, 1993).

Which Elements Are Most Likely to Become Part of a Culture?

There is strong evidence for the predictions of DSIT across a variety of methodologies and attributes, but the findings we have discussed thus far are largely process oriented. What about the *content* of culture? Are some cultural elements more likely to spread and become self-organized (i.e. cluster, correlate, and consolidate) than others? Research reviewed below suggests that attributes that are more important to people, less genetically transmitted, easier to observe, and 'true' are more likely to be among those that define cultures.

Involvement

Because DSIT is based on the reciprocal effects of individual influence, one place to look for moderators of its effects is among factors that affect persuasion. One of the most researched moderators of attitude change is personal involvement (Eagly & Chaiken, 1993). There are a number of reasons why involvement might affect DSIT's outcomes (see Cullum & Harton, 2007), with one of the main reasons being the different ways in which involving (e.g. personally important, relevant) and uninvolving attitudes change in response to influence. According to the catastrophe theory of attitudes (Latané & Nowak, 1994), attitudes about issues that are very uninvolving will tend to be neutral and change in proportion to information. If an argument is provided in favor of the issue, the attitude should become slightly more positive, and vice versa. Highly involving attitudes, on the other hand, are predicted to act as categories – someone is either very for the issue or very against it. These attitudes are less likely to change, but when they do change, the change occurs disproportionally, meaning that it is larger than would be expected based on the amount of influence just encountered. For example, arguments against abortion are likely to have little effect on the attitude of someone for whom the issue of reproductive rights is very important, until some point when there is so much counterinfluence that, like the straw that broke the camel's back, her attitude suddenly switches to the opposite stance. Several studies, using a variety of issues and methodologies, have shown that involving attitudes do tend to be more extreme and stable, but when they do change, the change occurs in larger increments (e.g. Cullum & Harton, 2007; Harton, 1998; Harton & Latané, 1997b; Krosnick, 1988; Liu & Latané, 1998).

This nonlinear or nonproportional change process for involving issues matters for DSIT because both mathematical proofs and computer simulations have consistently shown that if attitudes change as uninvolving ones are suggested to above (in direct proportion to influence), everyone in the group will eventually share a single 'average' opinion (Abelson, 1964; Latané & Nowak, 1997; Woelfel & Fink, 1980). The 'stickiness' and extremity of attitudes that seem to occur for more involving issues are necessary in order for the stable differences we see in attitudes and behaviors across the globe to have emerged (Latané & Nowak, 1994, 1997). Thus, attitudes or attributes that are at least somewhat involving should be more likely to cluster, correlate, and consolidate (Harton & Bourgeois, 2004). This process should occur more quickly for moderately involving issues (e.g. attitudes about fraternities) than for extremely involving issues (e.g. religion), but computer simulations (Latané & Nowak, 1997) suggest that as long as attitudes are at least somewhat 'nonlinear', stable regional differences will emerge.

Supporting this idea, Cullum and Harton (2007) showed in their field study that issues that the campus community rated as initially more important showed greater increases in clustering and correlation over time than those that were less important, even when controlling for levels of discussion. Increases in clustering over time were also related to increases in the importance of the issue due to outside events. Clustering of attitudes toward the Iraq war increased from before to after the actual war began (Cullum, 2007), when it presumably became a more immediate and involving issue. Laboratory studies have shown that important attitudes cluster to a greater extent than less important attitudes as well (Okdie, 2007).

Heritability

Another factor that affects individual attitude change is heritability; at least some attitudes contain a genetic component, and this fact may make them more resistant to change (Tesser, 1993). This heritability coefficient is often assessed via twin studies, which show that some attitudes are more likely shared by monozygotic twins (who share genetics and environment) than by dizygotic twins (who share environment but are less genetically similar). While it is unlikely that these highly heritable attitudes, such as liking of jazz and support for the death penalty (Tesser, 1993), are directly encoded in our DNA, they may be related to temperament and physical differences that are more directly inherited (Olson, Vernon, Harris, & Jang, 2001). For example, liking of jazz may be affected by sensation seeking or by differences in how people process sounds, which may be genetically transmitted.

Because highly heritable attitudes are less open to influence (Tesser, 1993), they may also be less likely to self-organize and become defining elements

of cultures. Consistent with this idea, Bourgeois (2002) found greater consolidation in small group discussions on low heritable issues (e.g. 'People should realize that their greatest obligation is to their family') than on ones with higher heritability estimates (e.g. 'The death penalty is barbaric and should be abolished'). Similarly, residence hall residents were more similar to their floormates at the end of the school year on attitudes with lower heritability estimates than higher ones (Bourgeois, 2002), seemingly as a result of more local social influence on the low heritability items.

Observability

Another variable that may affect the extent to which an issue spreads is the degree to which it is observable (Rogers, 2003). Social influence does not have to occur through verbal communication; people are also influenced by what they see others do. For instance, clothing styles are influenced by what we see others wearing at least as much as by what they tell us they like to wear. This moderating effect of observability has been demonstrated in several field studies. For example, behaviors that are more observable (e.g. leaving doors open, binge drinking) show greater increases in clustering than those that are less observable (e.g. eating fruits and vegetables, studying; Cullum & Harton, 2006; Harton, 2005). A similar study examining environmentally conscious behaviors in two residence halls also found greater increases in clustering for behaviors that fellow residents were more likely to observe, such as recycling, opening windows, and turning off water while brushing teeth than for those less visible to housemates such as driving less or leaving the car running during errands (Harton, 2005; Yates & Yates, 2005).

Demonstrability

The degree to which we show that an opinion or answer is 'correct' also affects self-organization (Harton et al., 2006; Heath & Heath, 2007; Rogers, 2003). Clustering increases to a greater extent after discussion for more demonstrable items (one that have a clearer 'true' answer) than for less demonstrable ones (Harton et al., 2006); people should be more open to influence on factual items (unless they think they already know the correct answer) than on opinion ones. Interestingly, however, in this study, even for 'eureka' problems – problems that have a clear answer that, when someone figures it out should become obvious to all (e.g. how to get a fox, rabbit, and head of lettuce across a river) – there was clustering and continuing diversity, in part because some people were convinced and convinced others that their incorrect answers actually were correct. Although 'truth' may make an element more likely to spread, different interpretations of that 'truth' ensure continuing diversity.

What Are Some DSIT Controversies, Critiques, and Areas for Future Research?

Is the attitude change real?

One possible criticism of some of these studies is that the attitude change effects in the computer-mediated and face-to-face studies may be simply due to demand characteristics. That is, people may realize that researchers are examining attitude change and change their attitudes accordingly. While it would be erroneous to contend that this *never* occurs, we do not believe that it is a major explanation of these results for several reasons.

First, the text of the discussions and the debriefing sessions suggest that participants are taking the discussions seriously and thinking about the issues. Second, there are similar effects of immediacy in both longitudinal and one-time field studies, where there are no reasons for people to think that researchers are necessarily looking at spatial attitude change. Participants are not made privy to the attitudes of their house or floormates as part of the study, so they have no study-provided reference of what their attitudes 'should' be. Third, people do not always change in expected ways; if demand characteristics were major influences in the studies, researchers would actually get greater amounts of self-organization than they do. Even when all their communication partners disagree with them, people often change less than 20% of the time (e.g. Harton, 1998).

How do we know these effects are due to communication and not to some other factor?

Of course, social influence is not the only possible explanation for regional differences in attitudes and behaviors. For example, climate affects aggression (Anderson, 1987) and depression (Molin, Mellerup, Bolwig, Scheike, & Dam, 1996) and may have an influence on other attitudes and behaviors as well. There are also demographic differences by region in characteristics such as gender (US Census Bureau, 2001), race (US Census Bureau, 2003), and income (US Census Bureau, 2006) that may affect attitudes. Furthermore, people may choose to move to places where like-minded people already live.

DSIT does not propose that these other factors have no effect, but rather that they are not the whole story (Harton, 2005). Geography alone cannot explain differences in accents or religious preferences, and demographic differences do not explain why people choose certain types of foods or are more individualistic or collectivistic. Similarly, selection seems to have limited effects on cultural differences. When people move, it is usually within their state or region (and culture; Berkner & Faber, 2003), and the minority who do move to different regions tend to change their attitudes and behaviors to be closer to those of people in their new

locale (e.g. Glaser & Gilens, 1997). DSIT does not suggest that local social influence is the *only* process that affects culture, but that it is a sufficient cause. The studies reviewed in this article demonstrate that regional differences in associated beliefs and attributes can emerge simply as a result of communication.

What is strength, and what are its effects on the group-level consequences of influence?

Although SIT research has supported strength (e.g. expertise, persuasiveness) as a factor in social impact, very few DSIT studies have examined strength effects. One problem with investigating strength is that it is at least partly subjective – one person may see Shirley MacClaine as an expert (high strength) source on spirituality, whereas another may see her as essentially zero (or even negative) in strength. It is also difficult to separate out the effects of individuals' characteristics on group-level outcomes of clustering and consolidation. If two groups with members of varying degrees of 'strength' have different levels of clustering, how can we discern which member or members of group A versus B are responsible for this difference? One way to deal with this problem is to study dyads (e.g. Bullock, 2007); another is to control the information that people get about other participants by limiting communication (e.g. by only giving people information about the choices and expertise of their 'neighbors'). Research using such techniques should help to clarify how individual differences in strength may affect where and to what degree clusters form.

What about globalization and electronic communication?

Books such as *The World Is Flat* (Friedman, 2005) suggest that individuals are becoming increasingly interdependent on one another. To some, this seems to herald a coming 'oneness' of cultures. This prediction echoes the fear of the 1950s of a 'gray suit' homogenization of culture as a result of national mass media. However, despite years of national television programming, there is more disagreement and diversity in the USA than ever. Even large international chains such as McDonald's and Wal-Mart make changes to suit their local audiences – offering lobster sandwiches in Maine or selling live frogs in China. DSIT allows that some, very unimportant issues may eventually show global convergence, but for the vast majority of cultural elements, local social influence should result in regional differences in attitudes and behaviors even when people are exposed to some of the same national or international sources of influence.

These international sources obviously include the Internet. Email and the Internet have been heralded as advances that will make physical

distance obsolete, by making it as easy to communicate with someone across the world as with your next door neighbor. Interestingly, people believed the same thing about the telephone when that technology was new (Aronson, 1971). And as with the telephone, those fears (or hopes) have been largely discounted. Although email and the Internet may make it easier for people to find distant others who share their beliefs, people still use it to communicate most often with those who live closest to them (Latané et al., 1995) and with whom they also communicate face-to-face (Koku, Nazer, & Wellman, 2001; Zhao, 2006). Face-to-face communication is also more influential (e.g. Topi, Valacich, & Rao, 2002), possibly because of the richer amount of information that it provides (e.g. nonverbal communication). The Internet may introduce more outside influences on some issues, but it is unlikely to threaten the effects of daily, local communication for most people.

What can short-term laboratory studies really tell us about cultural processes?

The majority of the studies reviewed here involved college students communicating with each other for hours, or at the most, weeks. We cannot go back in time to examine how current cultures came to be, hence, researchers have instead used computer simulations or created their own laboratory 'subcultures' to examine DSIT's explanation for the origins of culture. These laboratory studies have shown that communication in spatially distributed groups consistently leads to self-organization. This research has been supplemented by field studies of cultural microcosms on college campuses that show the same outcomes, even when researchers do not control who talks to whom, when. The next step is to go up one more level and use historical and anthropological data to examine whether clustering, correlation, consolidation, and continuing diversity have occurred for existing cultural elements at larger scales (e.g. state, region, country). Harton and Bourgeois (2004) did just that, reviewing research from a variety of disciplines that demonstrate that language, stereotypes, and mental health show the self-organized patterns predicted by DSIT. Together, these three levels of analysis provide strong, converging evidence that the processes observed in the laboratory groups can lead to the differences observed among various cultures today. Other cultural elements, such as religions, attitudes toward aggression (Richardson & Latané, 2001; Vandello & Cohen, 2004), values (Schwartz & Rubel, 2005), and conceptions of enemyship (Adams, 2005), likely arose at least in part from local social influence as well.

Studies of laboratory groups have also contributed to our understanding of the psychological foundations of culture by suggesting several additional factors that may make cultural elements more likely to propagate. For example, researchers have shown that information that is easily passed on (Atran & Norenzayan, 2004; Berger & Heath, 2005; Heath & Heath,

2007; Lyons & Kashima, 2001), meets people's individual needs and goals (Schaller & Conway, 1999), or invokes emotions (Heath, Bell, & Sternberg, 2001; Heath & Heath, 2007) is more likely to be communicated to others. DSIT predicts that this communication advantage should lead elements holding these characteristics to be more likely than others to become *cultural* elements.

Conclusions

Research on dynamic social impact theory has shown that culture can emerge merely through everyday social influence from people who live close to us. This local social influence results in four markers of culture: spatial clustering of cultural elements, correlations between elements as a result of clustering, consolidation or a reduction in diversity over time, and continuing diversity. The cultural attributes that are most likely to spread and define a culture are those that are more involving, observable, and demonstrable and less heritable. This theory and area of research provides insights into how cultures form and change and which elements are most likely to proliferate and delineate cultures.

Acknowledgments

Short Biographies

Helen C. Harton obtained her PhD from Florida Atlantic University. She is currently Professor and Coordinator of Graduate Studies in Psychology at the University of Northern Iowa, where she teaches courses in Research Methods and Social Psychology. Her research interests include attitude change, social influence, prejudice, and the evolution of culture.

Melinda Bullock is a PhD student in social psychology at Saint Louis University. She completed her Master of Arts degree at the University of Northern Iowa. Her master's thesis explored dynamic social impact theory and focused on the multiplicative and reciprocal effects of strength and immediacy on social influence. Melinda's research interests lie broadly in social influence, attitudes, and prejudices/stereotypes.

Endnote

* Correspondence address: Department of Psychology, University of Northern Iowa, Cedar Falls, IA 50614-0505, USA. Email: harton@uni.edu.

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