The Emergence of a Shared Identity:
A Simulation

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Abstract
Previous research has established that when individuals believe that an other state shares a common identity with their own, the other state is perceived as less threatening and the individuals indicate a greater willingness to cooperate with them. We build on this research by shifting the focus to the societal level: how does a sense of shared identity spread throughout, and become dominant in, a population? We employ an agent-based model to explore this question. Each agent is modeled using information gathered through experiments with human subjects. In the simulation, the interaction of individual agents leads to the emergence of a shared identity among members of the population. Three findings emerge from the analysis. First, there is a curvilinear relationship between the complexity of identities and the spread of a shared identity. While expanding the identity repertoire of individual agents increases the likelihood of a shared identity to a point, further expansion reduces the likelihood of a widely shared identity. Second, we find that the presence of leaders (i.e., agents with greater influence in the population) slows the emergence of a shared identity. Third, increasing the environmental bias, which randomly favors some identities and penalizes others, has a limited impact unless leaders are present in the population.

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Introduction

Realists have long argued that power considerations should dominate perceptions of threat in international relations. In an anarchic world characterized by self-help, states must constantly be wary of more powerful states. From the realist perspective, threat is an objective measure which can be calculated from the material balance of power. Constructivists have challenged this view by arguing that a shared sense of identity can reduce, or even eliminate, perceptions of threat posed by power asymmetries. While the constructivists have described collective identities (e.g., organizational culture in Kier (1997), national culture in Berger (1998), and global norms in Finnemore (1996)), the process of identity construction has been largely ignored (Kowert and Legro 1996: 46). This paper represents a first step toward filling this void by exploring the critical question: How do perceptions of shared identity spread through, and become dominant in, a population?

Constructing Identity

Psychologists have long been interested in identity construction. As reflective humans, we constantly evaluate the question "Who am I?" (Baumeister 1998). The answer to this simple question serves as a foundation for organizing relations with others (Brewer and Brown 1998). If you define yourself as a Republican (or homosexual or Catholic or white), the definition influences how you respond to both members of the in-group (e.g., other Republicans) and the out-group (e.g., Democrats or Libertarians). Within the context of international relations, how individuals define themselves as American (or any other state) can influence how they define other states and their sense of shared identity.

Identities are not fixed in time and space. Although self identity is relatively stable in the short term, it can change dramatically over time. An individual's assessment of what it means to be an "American" can change dramatically between one's twenty-first and forty-first birthdays. Moreover, the identity of other states can vary dramatically. Given that most individuals have limited knowledge about and interaction with foreign countries, it is not surprising that impressions of the foreign countries can vary widely across time.

But how are identities constructed? Suppose an individual is asked the following question: “Should Japan become a permanent member of the United Nations Security Council?” Immediately, the individual must construct some image of Japan. If we were able to ask the person this question repeatedly across time, we would find that he or she relied on a small set of dimensions to evaluate the other state. We refer to these dimensions as "latent" because on any given day, only a subset of the dimensions will be salient and used in the decision process.

Figure 1 illustrates the process of identity creation for an American when asked a question about Japan. From the list of thirteen latent dimensions, three dimensions are salient for the individual - - regime type, economic structure, and external orientation. This individual evaluates both her own country and the other country using these salient dimensions. She concludes that both countries are democratic and capitalist but that the United States is internationalist and that Japan is nationalist. Her net assessment is that the two states share a similar (but not identical) identity.1

*** Figure 1 about here ***

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1 The process is iterative in that the individual's self assessment may make certain dimensions more salient for the construction of the "other" and vice versa (Hopf 1999). So when Jane Doe thinks of the United States certain dimensions come to mind and when she thinks of Japan other dimensions come to mind. Ultimately, a comparison will be made on each dimension because both countries are salient.
Rousseau et al. (2001) explored this model of the construction of self and other within the context of international relations in an experimental setting. They found that individuals vary greatly in the number of dimensions used to evaluate others, more knowledgeable individuals employ more dimensions, states seen as more similar are viewed as less threatening, and priming individuals to view states as similar increases their willingness to cooperate with this "other."

The model developed and tested by Rousseau et al. (2000) focuses on how individuals construct images of others. The experiment demonstrated that subjects had images of other countries such as China and Russia, and that these images could be altered by making certain dimensions more or less salient. The current paper applies the insights of identity construction at the individual level from the experiment to the societal level. How does your image of China or Japan influence the images of constructed by others, and vice versa. In order to explore this societal level question, we develop and test an agent-based model of identity construction. The model will be used to test three hypotheses:

H1: A dominant shared identity is most likely to emerge with populations with "medium" levels of complexity. Low complexity inhibits the spread of a shared identity and high complexity allows new shared identities to invade as hegemony approaches.

H2: The greater the percentage of percentage of ideological (pragmatic) leaders, the greater slower (faster) the emergence of a shared identity.

H3: The more volatile the environmental bias (i.e., the favoring and disfavoring of specific identity dimensions), the slower the emergence of shared identity.

A full explanation of the logic of each hypothesis appears below.

**Simulation Model**

Our simulation model is based on Lustick’s Agent-Based Identity Repertoire (ABIR) model (see Lustick 2000). The ABIR model derives its inspiration from constructivist insights regarding both the stickiness of identities in the short run and their fluidity in the long run. Agents have repertoires of identities whose composition changes over time in response to the identities of agents encountered in the simulation. Agent repertoires are limited in size, so that it is never possible for any agent to have the full spectrum of possible identities in its repertoire. In Lustick’s model, a single identity in each agent’s repertoire is ‘activated’ at any one time, i.e. currently most salient to that agent. This is also the only identity that is visible to other agents. An identity is added to a repertoire (and may become activated in turn) when a certain percentage of agents in the neighborhood share a similar identity. In order to make room for such new identities, identities that have not been active in a while are dropped from the repertoire.

Our simulation model differs from ABIR in a number of important respects. First, agents possess multiple dimensions in their identities. So in ABIR, an agent can be Republican, homosexual, Catholic or white. In our simulation, an agent could possess all four attributes simultaneously. Second, agents in our model possess both a self-identity (e.g., what does it mean to be an American) and an "other" identity (e.g., what is China?). Unlike ABIR, our model focuses on the sense of shared identity in the population.

Figure 2 illustrates the basic features of our simulation model. The population consists of a non-wrapping 40 x 40 grid of agents. Each agent interacts with its Moore 1 neighborhood (i.e., the eight other agents surrounding the agent). For each iteration of the simulation, the agent

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2 Future analysis will focus on alternative landscapes such as a 50 x 50 torus landscape.

3 Future analysis will allow actors to interact with more distant agents (e.g., Moore 2 or Moore 3).
The emergence of a shared identity compares its evaluation of "self" with those in the Moore 1 neighborhood. For example, if everyone in the neighborhood views the United States as "capitalist," then this dimension and attribute value will be made salient. The agent then compares its evaluation of "other" with those in the Moore 1 neighborhood. For example, if everyone in the neighborhood views China as "non-democratic," then this dimension and attribute value will be made salient. The sense of shared identity (i.e., the degree to which "self" and "other" overlap) can change with each updating.

*** Figure 2 about here ***

Identities:
Each agent has a number of identity dimensions in its repertoire; the number of dimensions in the repertoire defines the "complexity" of the identity. In Figure 2 we see that both the actor and its neighbor utilize four identity dimensions (i.e., they have similar complexity). However, while the "actor" employs dimensions 1, 9, 13, and 20 to define itself, the neighbor employs dimensions 1, 2, 4, and 7. The simulation results presented below limited the number of possible dimensions to 20. Rousseau et al. (2001) found that subjects with more knowledge about international affairs employed more dimensions when comparing pairs of countries.

Salience:
The salience of identities in the repertoire can vary. While an individual might define themselves as Republican, homosexual, Catholic and white, the relative importance of each element can vary with respect to the situation. On election day the political identity may dominate while on gay pride day the sexual identity could dominate. Unlike previous simulations, we allow salience to vary from 0 to 1. Introducing this generalization makes it possible to allow agents to ‘see’ multiple components of neighboring agents’ repertoires, and to represent the empirical fact that people rarely express a single identity to the exclusion of all others. Each iteration, the salience of the identity dimensions are updated based on an assessment of the neighborhood. If your family, co-workers, and the national media repeatedly use "religion" to define the United States and distinguish it from China, you are more likely to employ this dimension.

Attribute Values:
Agents also have attribute values for each identity in their repertoire. Thus, identities in our setup are best thought of as identity dimensions — from race or religion to hair color or shoe size. If an agent has ‘hair color’ in its repertoire, for example, that implies that it considers hair color relevant in determining the degree to which others are similar or different. Whether they are, in fact, similar or different is determined by their respective hair colors. For the sake of simplicity, we allow only two different values per identity dimension. In Figure 2, we see that the "actor" uses dimension 1 to define itself and codes itself as "a" on this dimension. While the "neighbor" also uses dimension 1 to define self, it codes itself as "b" on this dimension.

Leadership:
Some individuals are more influence than others in shaping the opinions of those around them. Before becoming President, Ronald Reagan had a radio talk show and newspaper column that reached millions of listeners and readers. Some individuals, such as politicians and clergy, have access to a broader audience then most average citizens. In order to probe the impact of

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4 Rousseau et al. 2001 found that American subjects employed just over 20 dimensions to evaluate other countries. The most common dimensions (e.g., regime type) were only used in approximately 14% of the cases.
variations in influence, we have incorporated "leaders" into our analysis. Opinion leaders or political entrepreneurs have a twice the influence of normal agents in the weighting identities in the neighborhood.

We introduce two different types of leaders: pragmatic and ideological. Pragmatic leaders are more willing to change their repertoires, and they do so before any of the normal agents or ideological leaders get a chance to consider updating. In addition, they are more sophisticated — their repertoires contain two additional dimensions, compared to normal agents. In contrast, ideological leaders are rather less likely to react to incoming information, and resist changing their repertoires and traits. In addition, their views are more simplistic than are those of the average agent: their repertoires contain two fewer dimensions.

**Environmental Bias:**
Agents use both local (i.e., neighborhood) and global information to calculate the salience of identities. Information from the global environment is received in the form of a bias value associated with each identity dimension. This bias represents an environmental signal about the system-wide value of the particular identity. It can be interpreted as indicating how favorable the structural context is towards the active expression of different identities. Biases change over time, randomly and independently from one another, and they change rather slowly — once every 100 time steps on average in our experiments here. A relatively high bias facilitates the adoption of an identity throughout the population, whereas a relatively low bias will impede it, or may even contribute to the gradual disappearance of the dimension from among the salient identities in agents’ repertoires.

**Repertoire Change: Adding and Subtracting Identities:**
This brings us to the issue of how repertoires change. First of all, salience levels decline by a certain fraction each round, unless they are reinforced by incoming information. The reinforcement or decline fraction is specific to the type of agent. For pragmatic leaders and normal agents, the average ratio is 10%; for ideological leaders it is just 5%, to reflect the fact that they are less flexible.\(^5\) If the sum of the environmental bias and the (influence-weighted) salience levels of those neighbors that have a particular identity dimension in their repertoire exceeds a specified threshold, the agent’s salience level for that dimension will be increased; if not, it will decline.

Next, agents consider adding new identity dimensions to the repertoire. For this action to take place, the value of that dimension (the sum of its environmental bias and the weighted saliences of those agents that have it in their repertoires) has to exceed a second, pre-specified threshold, which will usually be higher than the threshold required for salience reinforcement. If this condition is met, an agent will remove the lowest-salience dimension from its repertoire, and add the new dimension, with an initial salience level of 0.5. A third, still higher, threshold determines whether this initial level will immediately be reinforced, along the lines described above.\(^6\)

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5 The actual size of the change is determined randomly at the time of updating, by adding or subtracting a random figure of up to twice the average size to or from that average. Thus, for an average change of -10%, the actual fraction will be between +10% and -30%. In other words, it is possible from time to time actually to show an increase in salience when a ‘decline’ takes place; conversely, occasional declines will occur when saliences are ‘reinforced’.

6 If the number of identities whose weights exceed the add-threshold is greater than the number of identities in an agent’s repertoire, N, only the highest-weight N identities will be added.
Finally, it may happen that the salience of a particular identity dimension fails to be reinforced long enough to decline below a certain minimum threshold, set to 0.1 in these experiments. In this case, there is a certain probability the agent will randomly pick a different dimension to replace it, assigning it an initial salience level of 0.5. The probability of performing such a replacement increases from 0 to 1 as the old identity’s salience drops from 0.1 to 0.  

**Attribute Change:**

Now that we have specified the process of adding and removing identity dimensions from an agent’s repertoire, it is time to describe the rules for changing an agent’s attribute values for the dimensions in its repertoire. For each identity dimension, an agent has two attribute values: one describing its own identity, and the other describing its belief about the other’s identity: for example, ‘blond’ for one’s own hair color and ‘black’ for the perceived hair color of the other. At the start of the run, initial values are chosen at random for the agents’ own identities. Their beliefs about the other are then determined using their priors. Each agent has its own prior belief about the degree to which the other is similar or different. These priors are initialized at the start of the run at 0.50. Once the simulation begins, the priors reflect the attribute value in the neighborhood. If an agent’s prior is 0.3 (i.e. fairly pessimistic), then the value for the other on a particular dimension is initialized such that there is a 30% chance it is the same as the agent’s own value for that dimension and a 70% chance that it is different. Each time a new dimension is added to an agent’s repertoire, the value for the other is decided in this same manner.

Finally, agents may also update their values for dimensions in their repertoire each round, if the number of agents around them with the opposite value exceeds a certain threshold. Different types of agents vary in the value of these thresholds, reflecting their relative willingness to change their own value and that of their perceptions about the other. For example, it seems reasonable to assume that pragmatic leaders will be quite ready to change both their own identity and their perception of that of the other; conversely, ideological leaders will resist either type of change. Normal agents, finally, are likely to be more willing to change their beliefs about others than they are to change their own identities.

Such changes in values inspired by information from an agent’s neighbors also lead to changes in the agent’s priors. If the result of a value change is that the agent’s own value and its perception of the other are now the same whereas previously they were different, the agent will increase its priors; in the opposite case, the priors will be reduced. The size of the change is the product of the maximum possible change (up to 1 or down to 0) and the relative weight of the agent’s salience for that identity dimension, rescaling all saliences to sum to 1.

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7 For more details on the identity repertoires and the process of updating them, see Lustick (2000) and van der Veen, Lustick, and Miodownik (2001). Our model is built on top of the code used in the latter paper.

8 For each dimension, there are two possible values, as described above. These are labeled 0 and 1. To introduce a certain degree of similarity among agents in the initial population, it is possible to select the probability that value 1 is picked for the agents’ own initial values. In our experiments, we used a purely random initialization, so that the values 1 and 0 were picked with a probability of 50% each. However, it is possible in the set-up to choose 1 with a probability of 75%, for example, which will result in most agents having similar initial values. Note that this has no effect on the identity dimensions that will initially be in an agent’s repertoire.

9 Note: agents are influence-weighted here, so that a leader counts for two. Saliences, on the other hand, do not figure into this calculation.
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This completes the description of the way the model functions. It remains only to specify the calculation of the sense of shared identity for each agent. This is calculated by rescaling all the salience levels of that agent’s identity dimensions to sum to 1, and then to add only those dimensions for which the agent’s own value and the perceived value for the other are the same. The resulting value will range from 0 (no identical attribute values) to 1 (all attributes values identical).

Simulation Results

Our initial experiments were divided into three groups. In the first experiment, we included no leaders, focusing exclusively on the impact of knowledge or complexity on the emergence of a sense of shared identity. The second experiment mirrored the first experiment, but here we chose vary the percentage of ideological and pragmatic leaders in the population. The third experiment varied the environmental bias in the model. Each experiment was repeated 5 times, and the data discussed here represent averages over those 5 runs. Parameters for the baseline model were set as shown in Table 1.

Table 1: Agent type specifications.

<table>
<thead>
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<th></th>
<th>Basic agent</th>
<th>Pragmatic leader</th>
<th>Ideological leader</th>
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<tr>
<td>Influence Level</td>
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<td>2</td>
</tr>
<tr>
<td>Updates First?</td>
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<td>no</td>
</tr>
<tr>
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<td>X+2</td>
<td>X-2</td>
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<tr>
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<td>3</td>
<td>2</td>
<td>X</td>
</tr>
<tr>
<td>Make Salient Threshold</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Both Add and Make Salient Threshold</td>
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<td>5</td>
<td>7</td>
</tr>
<tr>
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<td>0</td>
<td>1</td>
</tr>
<tr>
<td>&quot;Other&quot; Attribute Update Threshold</td>
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<td>0</td>
<td>1</td>
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<td>.05</td>
<td>.05</td>
<td>.01</td>
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</table>

All updating is done asynchronously, in random order. This means that every time steps, agents update their repertoires and traits in random order (a different order each timestep), and that these changes immediately become visible to other agents in their neighborhood that have not yet updated their identities during that timestep. This mode of updating was chosen over synchronous updating (where every agents updates simultaneously) because the latter method has been shown to risk generating outcome patterns that can be considered spurious because they depend entirely on this fairly artificial (and not empirically realistic) mode of updating (see Huberman & Glance 1993, Page 1997).

Finally, the pseudo-random number generator used in determining initial trait allocations, priors, the location of leaders, and the stream of environmental biases and saliences over time was a generator proposed by George Marsaglia (an authority on validating the quality of RNGs) in Florida State University Report FSU-SCRI-87-50. It is seedable, has a period of $10^{30}$, and passes

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10 Although any simulation is stochastic and thus needs to be run repeatedly to have some measure of confidence in the outcomes, the particular measures of interest to us remain relatively constant from run to run, hence the number of repetitions is lower than is sometimes the case in simulation studies.

11 The only proviso to this statement is that all pragmatic leaders (when present) update before any other agents in the population do.
all the statistical tests. The code for the RNG and for the rest of the model was written in Macintosh Common Lisp and executed on a Macintosh Powerbook G3 (Pismo).

**Altering Complexity**

The experiments by Rousseau et al. (2001) indicated that individuals vary greatly in the number of dimensions used to evaluate other states. They also found that individuals with greater knowledge tended to employ more identity dimensions in a series of open-ended questions. This raises an interesting question: **will a sense of shared identity emerge faster in population with greater complexity?** At first glance, the answer would seem obvious. If individuals in a society have a limited number of identity dimensions such as 3 or 4, it will be difficult for a shared identity to emerge because of limited number of common identities. For example, if everyone in the population has two identity dimensions, then it is quite possible that no one in the Moore neighborhood will share a even a single common identity. The greater the number of identities in my repertoire, the more likely I will share some identities with my neighbors and the easier it should be to spread an identity throughout a society.

However, the answer is not as obvious as it first seems because of a countervailing pressure: as the complexity of repertoires increases it becomes easier for new identities to emerge and challenge dominant identities. Given this possibility, we predict a curvilinear relationship -- shared identity should be low at very low and very high levels of complexity. In order to test this hypothesis, we ran the simulation with repertoire sizes fixed at 4, 8, 12, and 16. The results are presented in Figure 3.

*** Figure 3 about here ***

Rather than presenting a simple "average shared identity" averaged over the five simulations, we provide a frequency plot that divides the agents into 10 bins according to their sense of shared identity. For example, the "<.10" bin on the left hand side of the horizontal axis includes all agents which have a shared identity between 0.00 and 0.10 at the end of 1000 iterations. Figure 3 indicates that about 110 of the 1600 agents in the 40 x 40 grid share an identity of 0.10 or less.

Figure 3 reveals that increasing the complexity of agents decreases the number of actors sharing very similar identities. For example, the number of agents sharing identities of between 0.70 and 0.80 decreases rapidly as we increase the number of dimensions in a repertoire. While a calculation of simple averages does not reveal a curvilinear relationship, Figure 3 reveals that a low repertoire size of 4 elements greatly increases the dispersion of shared identity. The unusual spikes in the figure are a product of the possible combinations. With 4 elements in a repertoire, you can share 0 elements, 1 element (1/4 or 25%), 2 elements (2/4 or 50%), 3 elements (3/4 or 75%), or 4 elements (100%). With only four identity dimensions in the repertoire, we find that many agents have one or less shared elements.

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12 It was programmed in Lisp by Chris McConnell at Carnegie-Mellon University, based on an earlier version in C by Karl-L. Noell & Helmut Weber at the Fachhochshule Wiesbaden, which in turn was based on a version in Fortran published by George Marsaglia and Arif Zaman at Florida State. The validity of each version was verified by the respective authors.

13 The mean values of the shared identity are as follows: .412 for repertoire size 4; .406 for repertoire size 8; .400 for repertoire 12; and .398 for repertoire size 16.
Adding Leaders

Leaders play a central role in the political discourse of all polities. Leaders promote specific views of the world because they believe it is morally right (ideological leaders) or it is politically expedient (pragmatic leaders). Would a society with many ideological leaders be less likely to foster a sense of shared identity? Conversely, would a society populated by pragmatic leaders be more likely to develop a shared identity with another country? We explored these questions by varying the composition of actors in the simulation. The baseline case contained no leaders. The "pragmatic case" contained 10% pragmatic leaders and no ideological leaders. The "ideological case" contained 10% ideological leaders and no pragmatic leaders. Finally, the "both case" contained 10% of each type of leader. In all cases, the balance of the population were normal agents. Figure 4 presents the results of the simulations holding the repertoire size at 8.

*** Figure 4 about here ***

Figure 4 indicates that the addition of leaders does not drastically alter the distribution of shared identity. The bimodal baseline simulation has a slightly larger number of cases with higher shared identity than any of the three remaining cases. The addition of 10% pragmatic leaders leads to a slight decline in the mean value of shared identity and produces a more unimodal distribution. The addition of 10% ideological leaders also causes a slight leftward shift in the distribution of shared identity. Finally, the addition of 10% pragmatic and 10% ideological produces a distribution very similar to the pragmatic case. In sum, while ideological leaders did inhibit the emergence of a shared identity as expected, the presence of pragmatic leaders did not have the opposite impact as hypothesized.

Increasing Environmental Bias

In our third set of experiments we examined the impact of environmental volatility on the emergence of shared identity. Agents use both local signals (i.e., the distribution of identities in the Moore neighborhood) and global signals when calculating the salience of identities. We refer to the global variable in the model as bias. Institutional structures tend to provide advantages for the propagation of some identities and disadvantages for others. In the 1950s in the United States, individuals were strongly discouraged from adopting communist as an identity element. In the model, identities are randomly selected for favorable and unfavorable treatment. Over time, this selections change albeit slowly. By increasing the intensity of the favoring and disfavoring, we can simulate a political climate that changes rapidly (e.g., rapidly changing administrations). Does this environmental volatility increase or decrease the emergence of a shared identity? The results, which once again employ a repertoire size of 8, are presented in Figure 5.

*** Figure 5 about here ***

Several comparisons can be made using Figure 5. First, we can compare the Increased Bias Model without leadership (i.e., the dark purple line with diamonds) to the Baseline Model without leadership (i.e., the red line with squares). The fact that these lines are virtually identical indicates that environmental volatility by itself does not significantly alter the emergence of shared identities. Second, we can compare the Baseline Model without leadership (i.e., the red line with squares) to the Baseline Model with leadership (i.e., the blue line with x's). As with the previous Figure, we see that the addition of both pragmatic and ideological leaders (at a 5% level in Figure 5) decreases the number of agents with highly similar identities. Third, we can compare the Increased Bias Model without leadership (i.e., the dark purple line with diamonds) to the Increased Bias Model with leadership (i.e., the yellow line with triangles). In stark contrast to the baseline case, we see that the combination of volatility AND leadership increases the sense of
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shared identity. Leaders can take advantage of a volatile environment to promote particular conceptions of "self" and "other." Simulations are ideal for discovering the implications of interactions within complex environments.

Conclusions

This paper represents an initial attempt to model how conceptions of self and other are spread throughout a population. In much of the constructivist literature in international relations, scholars begin with the observation that society X possesses attribute Y (e.g., the Japanese are anti-militarists or Americans are individualists). We hope to push the investigation back one step by exploring the process through which identities such as anti-militarist and individualist are spread through a population and maintained across time. By linking our simulation parameters to laboratory experiments with human subjects, we hope to explore the process through which individuals continually construct a sense of "self" and "other."

Three broad conclusions emerge from the analysis. First, the knowledge of the population and the complexity of their conceptions of self and other can have an important impact on the emergence of a shared identity. Second, the presence of political entrepreneurs can decrease the likelihood of the emergence of a shared identity by create homogeneous clusters within a broader population. Third, there is an interactive effect between the volatility of the environment and the presence of political entrepreneurs. Only the presence of both conditions simultaneously can increase the amount of shared identity.

We believe that future research on spread of shared identity should focus in three areas. First, the simulation should be adapted to allow for more heterogeneous environments. Second, we need to expand experimental research exploring how individuals construct identities. In particular, we need to explore the relationship between latent and salient identity dimension in greater depth. Finally, we need to empirically test the conclusions of the simulation with real world data.
References


Figure 1: Illustration of Constructing an Identity for Japan

Lauren Dimensions
- Wealth
- Regime Type
- Military Power
- Trade Orientation
- Utility of Force
- Economic Structure
- Religion
- Position in Hierarchy
- Homogeneity
- External Orientation
- Good/Bad
- Just/Unjust
- Protect the Weak

Salient Dimensions
- Regime Type
- Economic Structure
- External Orientation

Evaluation of Self and Other
- Self: Democracy
- Other: Democracy
- Self: Capitalist
- Other: Capitalist
- Self: Internationalist
- Other: Nationalist

Degree of Shared Identity
The emergence of a shared identity

Figure 2: Illustration of the Model

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Figure 3: Simulation Results With Varying Complexity

Shared Identity:
Baseline Model @ 500 Rounds (Repertoire Size 4, 8, 12, and 16)
The emergence of a shared identity

Figure 4: Simulation Results With Leaders

Shared Identity:
Leadership Model @ 500 Rounds w/ Repertoire Size 8
Figure 5: Simulation Results with Greater Environmental Bias

Shared Identity: Increased Bias Model
(Repertoire Size 8)