Stability as an Outcome in Communication Research

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Abstract

Since the earliest days of communication research, key findings have often involved the claim that attitudes or behaviors become stable due to communication. Research tends to focus on changes in attitudes or behaviors, however, which can cause confusion when changes are not observed. A lack of theorizing about stability leaves scientists unable to distinguish between null results and attitude stabilization that occurs due to communication. Furthermore, research tends to use the term reinforcement in a way that sometimes means stability, but in others means attitude change. This article argues that stability can be an effect of communication and provides an overview of the research designs and statistical models needed to perform research of this kind. It concludes by showing how an existing theory, the Reinforcing Spirals Model (Slater, 2007), can be used to make predictions about how communication leads to stability.

In communication research, the notion of an effect in the human subjects setting has become near-synonymous with changes in attitudes or behavior. Although such changes are often both important and interesting, many researchers do not consider a lack of change as a potential effect of communication as well. There are many possible reasons for this, but I will argue it is likely due to historical and sociological factors alongside uncertainty around how one could design studies that treat stability as an outcome in quantitative social science research. Many of the most urgent problems facing communication researchers concern people who appear resistant to change; in the context of social scientific studies, this is often framed as people who experience no effect of communication. Communication research designs may indeed produce findings of no effect, but this does not mean a person whose attitude or behavior is unchanged is unaffected by communication. In fact, my argument is that in many cases the lack of change may be due to the influence of media and social connections. To test these possibilities, researchers must both theorize about stability and carefully design studies to assess whether stability occurs in spite of or because of communication.

The claim that mediated communication has limited influence on attitudes and behavior has played a prominent role in the history of communication research. Lazarsfeld, Berelson, and Gaudet (1948), for instance, claim to have found "no overt effect on vote behavior at all" (p. 87) from communication in their trailblazing Erie County study. Lazarsfeld et al. (1944/1948) had a nuanced message on this topic, but the received history of the study and its contemporaries is one that emphasizes a lack of media effects (e.g., Klapper, 1960). Although some have reconsidered whether this was an accurate characterization of the results of media research in the 1940s and 1950s (e.g., Gitlin, 1978), given the existence of contrary findings (e.g., Lang & Lang, 1953) and later reanalyses of the data, more important than the findings themselves is the remembered

history[1]. Near the end of this era of supposedly minimal effects, some of the field's brightest minds cast doubt on the continued usefulness of (mass) communication research (Berelson, 1959), something even those who were not so pessimistic struggled against (Lang & Lang, 2006).

Of course, the field moved on despite the doubts and eventually entertained theories suggesting strong effects of media (e.g., Gerbner & Gross, 1976). Nonetheless, I will argue that those raising alarms about minimal effects won the argument in at least one respect: They defined "effects," at least interesting ones, as those that involve categorical or directional *change* in attitudes or behaviors. When scholarly arguments about minimal effects resurfaced in the recent past (Bennett & Iyengar, 2008; Holbert et al., 2010), the locus of disagreement was on whether this type of media effect — in which attitudes or behaviors are made less extreme or shift into a new category entirely — was the only kind worth studying. Lang and Lang's (2006) reflection on the first minimal effects era stresses how, irrespective of the contested empirical basis for the *Personal Influence* findings, the effect was to narrowly define media effects as the kind the Columbia school deemed weak.

But all along, another kind of influence was acknowledged. Lazarsfeld and colleagues (1948), just after reporting the headline finding of "no overt effect," pose the rhetorical question of whether their results mean that campaign communications had no effects on the many people who voted along with their usual partisan identity. The answer:

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[1] To borrow a phrase from Dennis and Wartella (1996) as well as Pooley (2006).

> Not at all. For them, political communications served the important purpose of preserving prior decisions instead of initiating new decisions. It kept the partisans "in line" by reassuring them in their vote decision; it reduced defections from the ranks. It had the effect of reinforcing the original vote decision. (Lazarsfeld et al., 1948, p. 87)

And Klapper (1960), in his influential summary of media effects research, concluded, "[w]ithin a given audience exposed to particular communications, reinforcement, or at least constancy of opinion, is typically found to be the dominant effect" (p. 15). Lazarsfeld himself enumerated 16 distinct types of media effects (Lazarsfeld, 1948), which Katz and Lazarsfeld (1955) would say was not quite comprehensive. Lang and Lang (2006) later concluded that these many qualifications to the famous findings of minimal effects were not widely received or commented on by contemporary readers and collaborators, some of whom — like Berelson — would go on to declare the field largely played out. Many years later, Bennett and Iyengar (2008) would predict that in the present era, media are unlikely to "do anything other than reinforce prior predispositions" (p. 724), echoing the Lazarsfeld group (1948). This assertion prompted Holbert et al. (2010) to remind that "the study of persuasion involves analyses of response shaping, response reinforcing, and response changing processes of influence, not just the latter" (p. 17).

Perhaps the most prominent exception to the claim that stability is not treated as an outcome in communication research is inoculation theory (McGuire, 1961; Pfau & Burgoon, 1988). This approach comes from persuasion research and uses the biological metaphor of immunization to explain the way that persuasive messages can pre-empt competing claims by providing and then refuting counterarguments. The basic expectation, then, is that attitude or behavior change does not occur upon exposure to competing persuasion attempts when

inoculation was part of the original message. Of course, since the point is to make successful attempts at persuasion robust to subsequent persuasive messages, this approach is still about change — just change that is more enduring. That being said, in applied settings, the focus is on promoting the maintenance of pre-existing attitudes, in which case inoculation is not so different from my own approach beyond my more general focus.

Stability is a type of effect besides the narrow one that has defined the popular narrative of the history of media effects research. It is the idea of reinforcement that most closely resembles the focus of this article, although I will point to some inconsistencies in the apparent conceptualization of this term. To be more precise about my own aims, I will argue that *stability* of attitudes, identity, and behavior is an underappreciated potential impact of communication — both mediated and interpersonal. Although stability clearly has been a through-line of key findings and debates in communication research, it has rarely been treated as an interesting end in and of itself. The reasons for this include minimal theorizing about stability as an outcome of communication, the conflation of stability and polarization, as well as a lack of well-known methodological and statistical tools for quantitative research on stability. To equip communication researchers with the tools to create and test theories about stability, I give a more nuanced conceptualization of the concept and give a detailed walkthrough of how it relates to the research designs and statistical models needed for quantitative research in this area. To show how existing communication theory provides tools to hypothesize about stability, I discuss the Reinforcing Spirals Model (RSM; Slater, 2007, 2015), which is well-suited for the task even though it is typically used for different purposes. I suggest a slight change to the theory to more efficiently explain why most people do not trend towards extreme identities and behaviors.

Stability vs. Reinforcement

Research and debate about persuasion has tended to contrast the outcome of conversion — in which someone starts out with one attitude or behavior and, because of some communication(s), adopts a new one — against reinforcement, which is understood as retaining the original attitude or behavior. The term reinforcement, however, has not been used consistently. Some use reinforcement to denote a lack of change or implying a resistance to change while others see reinforcement as a strengthening of the attitude or behavior. I use "strengthening" in this context to mean more extreme (e.g., a liberal political position becomes more liberal). Lazarsfeld et al. (1948) described the reinforcement effect as having "reduced defections from the ranks" (p. 87) in the context of voting for the candidate of one's political party. Voting is a binary behavior; a person either votes for the candidate or not. It cannot be said in this case that Lazarsfeld et al. (1948) showed that a person voted *more* for their party's candidate when exposed to campaign materials, only that in aggregate exposure was associated with greater numbers of people voting for their party's candidate. In other words, it is not clear whether reinforcement meant a strengthening of an underlying attitude or just that individuals were effectively inoculated against conversion. Both are possible, but a common theme in research is a lack of distinction between these possibilities.

Both Bennett and Iyengar (2008) and Holbert et al. (2010) agree conceptually that in political communication, an outcome of reinforcement would be polarization[2], meaning a reinforcement effect implies more extremity in the attitude or behavior. Dilliplane (2014)

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[2] They do have an apparent disagreement over whether and to what extent such effects actually occur.

operationalizes reinforcement in the context of voting as an increase in favorability towards a candidate among those whose stated intention to vote for the candidate did not change throughout the political campaign. Livingstone (1996), on the other hand, comes out more clearly with a conceptualization of reinforcement as a lack of change, referring to such effects as those that "reinforce the status quo" (p. 307). Knobloch-Westerwick and Meng (2011) at times refer to both reinforcement and stability but do not make a clear distinction. In their discussion, they refer to reinforcement as the product of individuals seeking "self-consistency and stability" (p. 365). Klapper (1960) makes a distinction between reinforcement on one hand and "constancy" on the other (p. 15). Potter (2011), who was trying to bring clarity to the conceptualization of communication effects, introduced "weight" as a property of attitudes that may be affected by communication. In Potter's framework, communication may result in categorical change (a change in kind), a change in strength, or weight, which Potter describes as its resistance to change and later refers to as reinforcement. None of these ways of talking about reinforcement are necessarily incorrect; the term's meaning has simply become ambiguous in its typical usage by communication researchers. In light of this uncertainty, I will avoid "reinforcement" to describe the concept of interest here even if some will understand it as such. Instead, I will refer to this core concept as "stability," which more clearly communicates the phenomenon in which change of any kind is either small, temporary, or lacking entirely.

When discussing stability, I refer to a lack of change, or consistency of identity, attitude, or behavior. In other words, strengthening is not an example of stability in the same way that categorical changes are inherently instances of instability. Stable attitudes or identities remain the same both categorically and in terms of their strength. Stable behaviors remain the same both in terms of whether they occur at all and how often they occur. I first will make a distinction a la

Nesselroade (1991) between intraindividual development and intraindividual variability. **Development** is "more or less enduring" and "construed as developmental" while **variability** refers to "relatively short-term changes that are construed as more or less reversible and that occur more rapidly" than change as just defined (Nesselroade, 1991, p. 215). As I have described the theoretical-historical context of this study, most research interest is on change (i.e., development) while I am focused on something more like variability as Nesselroade understands it. Note that stability, in this framework, is a purely within-person phenomenon. Most research on the stability of communication focuses on rank-order stability. Rank-order stability refers to the extent a person measured at one time point is expected to rank similarly compared to others measured at the same time in a subsequent measurement. Such methods also treat non-monotonic variation as measurement error, even though it may correspond to true variation that just does not persist over time. In a self-regulating system — something that should describe a person who is stable — a departure from equilibrium is not expected to last, much in the same way a measurement error is expected to behave, even though the former is in fact a "real" change in the underlying construct.

Ram and Gerstorf (2009) provide more nuance to the Nesselroade (1991; see also Nesselroade & Ram, 2004) development vs. variability distinction, separating types of variability they call *net intraindividual variability* and *time-structured intraindividual variability*. As the terms imply, net variability refers to the total amount of change without consideration of the time ordering of the changes. The standard deviation is a way to quantify net variability; the quantity remains the same regardless of the order in which the observations occur. This means one could plausibly have the same standard deviation for two time series in which one is a straight line with non-zero slope and another that resembles an electrocardiogram (EKG) with many peaks and

valleys. More substantively, net variability is independent of time in the sense that a deviation from the norm is not at all influenced by whether and how much there was a deviation from the norm at any previous times. Time-structured variability is generally considered to be the result of a dynamic process(es). An EKG has clear time-structured variability given that the level at any moment is contingent on the levels at several previous points in time. Whether a heart starts to beat has a lot to do with how much time has passed since the previous beat.

Research Designs and Statistical Approaches to Study Stability

Most communication theories would be interested in stability at the individual level and the predictors thereof. In this section, stability and variability are used interchangeably, such that more variability means less stability and vice versa. Most social scientific research on stability comes from psychology, where areas of focus include treating intraindividual variability in cognitive and other constructs as leading indicators of problems related to aging (e.g., Mroczek & Spiro, 2003) as well as intraindividual variability in affect and personality being related to measures of wellbeing (e.g., Greenier et al., 1999; Kernis et al., 1993). In any case, a common end goal is to produce a variability estimate for each person under study.

Current approaches for the study of stability require longitudinal research designs. To generate reliable inferences about the individual-level causes of variability, the necessary designs require many more measurement periods than are common in communication research. For most questions relevant to communication theory, this likely takes the form of panel surveys but with 10 or more waves. Although the time spacing between each measurement should be determined by theoretical considerations, it is typically most practical to choose frequent measurements (e.g., daily) since this reduces the likelihood of attrition. Such frequent measurements make the

common designs more like experience sampling or diary studies (e.g., Z. Wang et al., 2012) than the longer time spacing associated with panel surveys. Note that in terms of statistical power, it is acceptable to make the tradeoff of having relatively fewer participants in exchange for having more measurements of each participant (Clark & Linzer, 2015; Jongerling et al., 2015), which can help researchers manage costs. Depending on the constructs under study, questionnaires may not be necessary; passive tracking, for instance, can give high-resolution data without the demand for frequent input from participants. Experimentation is also possible: Researchers may administer a stimulus at one or more points in time throughout data collection to assess whether the stimulus seems to promote variability.

Statistical estimation of stability

Although there are many patterns that may describe the time-structured variation within an individual, this paper will focus on perhaps the simplest. The most readily available measure of time-structured variability is the autocorrelation, AR(*p*), where *p* is the order of autocorrelation. For simplicity, I will discuss the AR(1) case in which the focus is autocorrelation between a value and its prior measure. AR(2) would mean the current value is affected by both its prior value and the value before that. Empirically, for each subject i one can estimate a separate lagged dependent variable regression model. The lagged dependent variable model can be symbolized as follows:

$$Y_{it} = \alpha_i + \phi_i Y_{it-1} + \epsilon_{it}$$

In the model, Y_{it} is subject *i*'s measure of variable Y at the present time, *t*. The other parameters in the model are an intercept (α_i) subject *i*'s measurement of Y at the previous measurement *t* -1 (Y_{it-1}), a regression coefficient relating the past and present observations of Y (ϕ_i), and random

error (ϵ_{it}). If the variables are standardized, α_i drops out and ϕ_i is interpreted as an autocorrelation.

An apparent downside of estimating a correlation coefficient — or covariance, if it is not standardized — with a separate model for each subject is that it is unusual to have enough observations per person to avoid considerable sampling variability. The reason it is apparent is because most researchers with conventional social science statistics training know that (for instance) 10 observations is a very small sample to use to estimate a correlation. This is, of course, partly why having a high number of measurement periods is recommended for research that cares about these parameters. More efficient statistical strategies exist, however, to make the most of the number of measurement periods available.

Recommended by Wang, Hamaker, and Bergeman (2012) and developed over several subsequent publications (e.g., Jongerling et al., 2015) is what they and I will refer to as the multilevel AR(1) model. In the preceding, I described an estimation method in which one estimates a separate AR(1) model for each subject. This can be described as a "no pooling" approach, in which the estimate for one subject has nothing to do with those for any other (in the terminology of Gelman & Hill, 2007). A pooled approach, in which the distinction between subjects is completely ignored in a single OLS model, is clearly inappropriate. Multilevel models are a compromise between these two approaches that can be described as "partial pooling" (Gelman & Hill, 2007). Using notation like Raudenbush and Bryk (2002), the multilevel AR(1) is

$$Y_{it} = \alpha_i + \phi_i Y_{it-1} + \epsilon_{it}$$

$$\alpha_i = \gamma_0 + u_{0i}, \qquad \phi_i = \gamma_1 + u_{1i}$$

Now we explicitly model *subject-specific* intercepts and autocorrelation parameters as a function of γ_j, the population mean of the parameter j (the intercept or slope), and u_{ij}, the subject-specific deviation from the population mean of the parameter j. The u_{ij} are assumed normally distributed[3] with mean 0 and variance τ_j. Each u_{ij} have a covariance as well. Conceptually, the model assumes that each subject is drawn from a common population of subjects and therefore information about one subject can be used cautiously to make assumptions about others.

The first equation is the level-1 (within-persons) model and is, in effect, a time series model. This means the caveats that apply to such models apply here, most importantly that the series should be stationary (have constant mean and variance). At minimum, the lack of a constant mean can bias estimates. The simple fix for this is to detrend the series, which can usually be accomplished by including t as a predictor. Doing so makes the model equivalent to what is commonly called a growth curve model. Including a person-specific slope for time yields a latent growth curve model (Bliese & Ployhart, 2002; Hox & Stoel, 2005). Note that subtracting trends from the Y_{it} before modeling yields equivalent results to including trends in the model (L. (Peggy) Wang & Maxwell, 2015), so as a general recommendation modeling the trends is suggested since they may be theoretically interesting. Importantly, detrending avoids confounding change-as-development with the kind of variability that is the focus of this section.

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[3] This assumption can be re-specified with any distribution provided there is software support.

In the multilevel AR(1), of interest is the ϕ_i, which is the person-specific autocorrelation. It is best to pause for a moment and reflect on the meaning of the autoregressive parameter. ϕ_i does *not* reflect rank-order stability like a typical correlation. Instead, the common interpretation of ϕ_i is as *inertia* (e.g., Suls et al., 1998) or *regulatory weakness* (Hamaker, 2012). Greater absolute values of ϕ_i, then, are interpreted as being indicative of *in*stability. Why? First, consider the person-specific mean, α_i, as the equilibrium point. Note that this is part of the reason for detrending the series, because it enables an interpretation of α_i as the equilibrium net of any developmental processes (Nesselroade, 1991). α_i is also sometimes conceptualized as the trait component of Y_i, whereas the parts of the model that contribute to the estimation of Y_{it} are modeling the state, net of the trait. In a stationary series with $\phi_i = 0$, the value of Y_{it} conditional on α_i is ϵ_{it}, which is assumed to have mean 0. The residual ϵ_{it}, often referred to as a random shock, is assumed exogenous and by definition not predictable. The ϕ_i parameter reflects the extent to which ϵ_{it-1} is carried over to Y_{it}. That is, $Y_{it} = \alpha_i + \epsilon_{it}$ when $\phi_i = 0$. The expectation for Y_{it+1} in this case is just $E(Y_{it+1}|Y_{it}) = \alpha_i$, meaning we assume an immediate return to equilibrium. When ϕ_i is non-zero,

$$E(Y_{it+1}|Y_{it}) = \alpha_i + \phi_i\epsilon_{it-1} + \phi_i^2\epsilon_{it-2} + \cdots + \phi_i^{T-t}\epsilon_{iT-t}$$

where T is the total number of time periods. A positive ϕ_i means the random shock persists and a change to the underlying construct is expected to last into future periods with a magnitude of ϕ_i^p, where p is the number of time periods into the future. A negative ϕ_i means the system overcorrects the prior wave's deviation from equilibrium past the equilibrium point. Plotted over time, a series with relatively higher ϕ_i will be characterized by broad peaks and valleys while negative ϕ_i produces rapid fluctuations around the equilibrium. Figure 1 shows three simulated

time series in which the random shocks have mean 0 and standard deviation of 1, but with different autocorrelation values (ϕ).

A useful metaphor is the path of the nose of an airplane. If random turbulence occurs, ideally the nose returns to its appropriate level as quickly as possible, as in the case of zero autocorrelation. High autocorrelation is like a pilot letting the plane veer off in the direction in which the plane was nudged. Negative autocorrelation is like the pilot constantly overcorrecting and essentially jerking the plane back and forth. Only the case of zero autocorrelation would be recognizable to the passenger as a stable flight path. Prior (2010) offers a similar interpretation of the ϕ_i parameter in his analysis of political interest, treating a near-zero ϕ_i as evidence for the very high stability of political interest through adulthood.

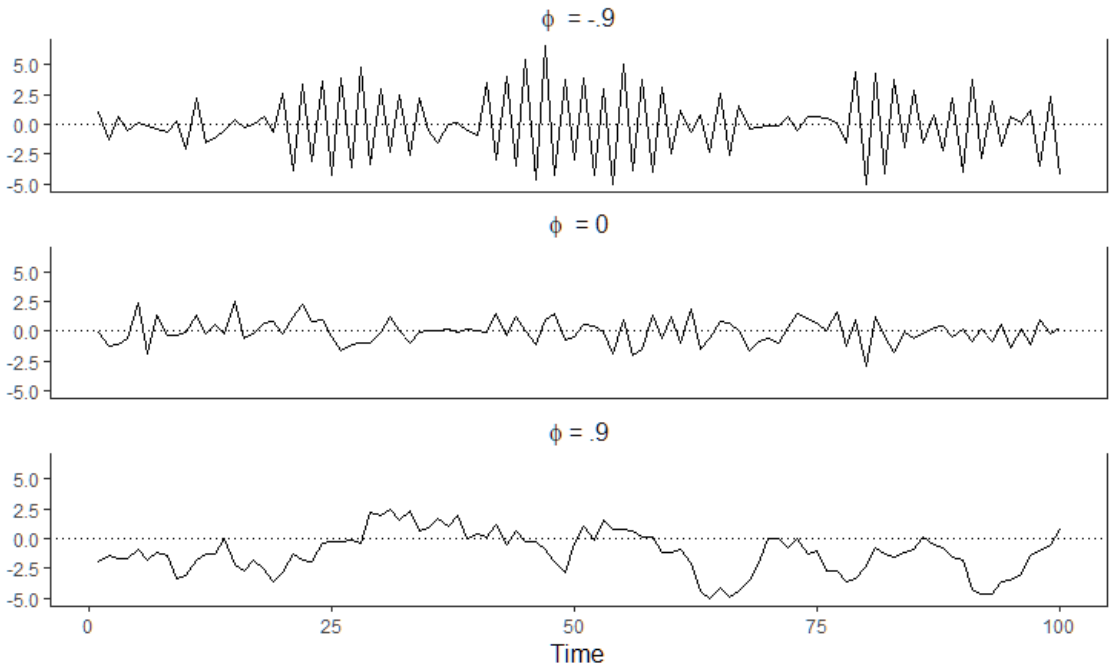

Figure 1: Time series with fixed innovation variance and different autocorrelations

To make statistical inferences about the correlates of ϕ_i, there are two main options: (1) fit the model, extract the ϕ_i, and run regression/correlation analyses on them or (2) incorporate the between-person predictors of ϕ_i into the multilevel model. Option 2 is what is known as a slopes-as-outcomes model (Raudenbush & Bryk, 2002). In a multilevel model, any predictor that does not vary within-person does not contribute whatsoever to the predicting deviations of Y_{it} from the person-specific intercept, α_i, because it provides no unique information for each t. Instead, such a predictor only informs the estimation of α_i, the person-specific intercept[4]. In other words, the multilevel model with between-person predictor z_i

$$Y_{it} = \alpha_i + \phi_i Y_{it-1} + \gamma_{01} z_i + \epsilon_{it}$$

Can be re-expressed as

$$Y_{it} = \alpha_i + \phi_i Y_{it-1} + \epsilon_{it}$$

$$\alpha_i = \gamma_{00} + \gamma_{01} z_i + u_{0i}, \qquad \phi_i = \gamma_1 + u_{1i}$$

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[4] A time-varying covariate will, generally, contribute both to the estimation of the person-specific mean α_i as well as Y_{it}'s deviations from it, which is not well-expressed by my notation. An exception is when all subjects have the same mean level of the time-varying predictor, in which case the covariates provide no unique information about α_i, only the Y_{it}'s deviations from it. This is, in fact, how so-called fixed effects models (also known as the within estimator) work in the multilevel framework. By subtracting the subject's own means from the time-varying predictor, all subjects have the same mean and therefore the variable's coefficient can only be interpreted as a within-subject effect (Allison, 2009; Bell & Jones, 2015; Curran & Bauer, 2011).

Which shows more clearly that the between-person predictor only factors into the estimation of α_i. In this specific case, the slope ϕ_i is of interest. Incorporating a between-person predictor works much the same way in that the goal is to get z_i into the ϕ_i equation. This is accomplished via an interaction term. The model

$$Y_{it} = \alpha_i + \gamma_{01} z_i + \phi_i Y_{it-1} + \gamma_{11} Y_{it-1} z_i + \epsilon_{it}$$

Expands to

$$Y_{it} = \alpha_i + \phi_i Y_{it-1} + \epsilon_{it}$$

$$\alpha_i = \gamma_{00} + \gamma_{01} z_i + u_{0i}, \qquad \phi_i = \gamma_{10} + \gamma_{11} z_i + u_{1i}$$

Which is known as the intercepts- and slopes-as-outcomes model (Raudenbush & Bryk, 2002). In sum, this approach allows for estimating the between-subject causes of over-time stability in the terms of time-structured variability.

An extension to this model allows for exploration of the between-person differences in the residuals, sometimes called *innovations* (Jongerling et al., 2015). An assumption of linear regression as well as multilevel linear models is homogeneity of residual variance. Multilevel models improve upon OLS regression by modeling the within-person correlation of residuals, but — at least in their basic implementation — still presume equal residual variance across persons. However, especially as the individual-level time series get longer, it becomes less believable that this assumption holds. Moreover, this is clearly an important aspect of variability regardless of ϕ_i. Even if there is no autocorrelation, high variance of the ϵ_{it} means the observed time series will be characterized by high variability. Figure 2 provides a simple visualization of the influence of the residual, or innovation, variance (σ^2) even when $\phi = 0$.

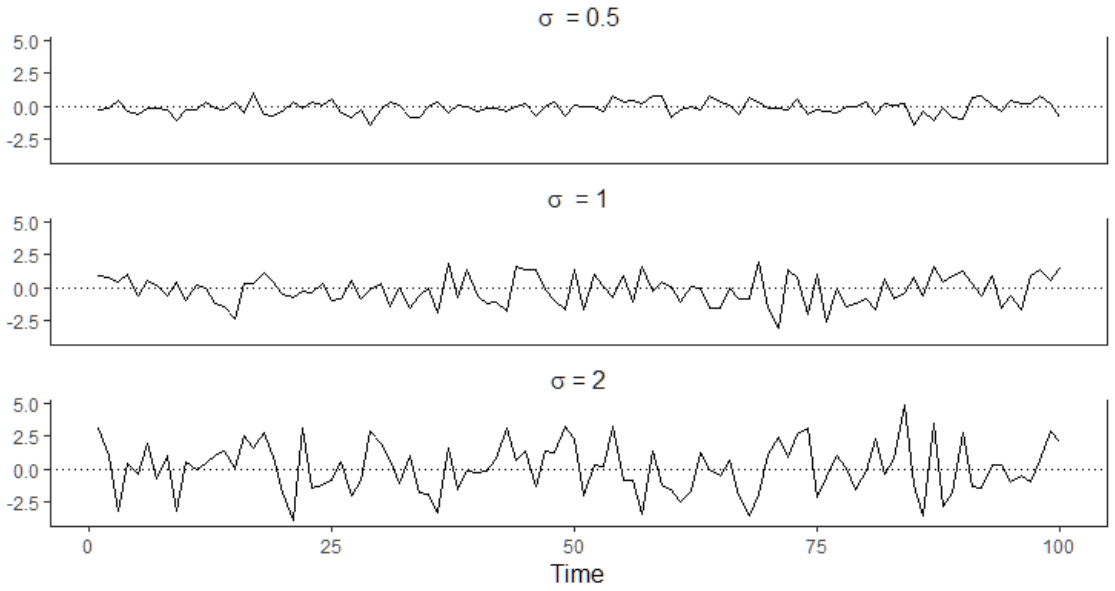

Figure 2: Time series with fixed autocorrelation and different innovation variances

Clearly, for a total description of stability, one must consider both ϕ_i, which corresponds most closely to time-structured variability, and σ_i^2, which corresponds to net variability. To return to the flight example, the net variability or innovations would correspond to the severity of the random turbulence.

Although some widely-used software for fitting multilevel models allows for person-specific residual variances, it is always treated as a nuisance parameter and including it as part of a model in which one predicts these variances with other variables is not feasible. One can sometimes extract these variances and analyze them outside the model, an option described earlier in the case of ϕ_i. It is strongly preferred, however, to estimate all the parameters within the model because they are interdependent (Jongerling et al., 2015). Bayesian estimation using Markov Chain Monte Carlo (MCMC) allows for models of arbitrary complexity and is particularly useful in the case of multilevel models in which there are many group-level

parameters to estimate and relatively little information on which to rely for each group (Gelman et al., 2014). In this case, the "groups" are the many observations for each individual subject. I will spare the reader a full description of Bayesian statistical inference, but the main point is that it is indeed possible to use person-level variables to predict individual differences in residual variances. These models are essentially equivalent to what are referred to as multilevel models with heterogeneous variance (L. Hoffman, 2007) and "location scale" multilevel models (Hedeker et al., 2012) that are used for analysis of intensive longitudinal data in fields like sociology and public health.

To put these pieces together, we are left with two distinct types of variability that can be estimated simultaneously. The autoregressive parameter is a proxy for the extent to which the system tends to return to equilibrium following a change. As explained, the closer the autoregressive parameter is to 0, the more efficient the self-regulating process is. The residual variance reflects another important aspect of variability that is likely to have more to do with environmental factors and one-off occurrences. Although more difficult to statistically model, and for which relatively little is known about statistical power, residual variance is of clear importance in the more general context of variation and stability.

The multilevel AR(1) can be generalized to even more complex relationships, including and especially multiple (inter)dependent variables. Much as the multilevel AR(1) model generalizes single-level AR(1) time series analysis, these models can be the building block for multilevel vector autoregression (VAR; Bringmann et al., 2013; Schuurman et al., 2016) in which multiple time series are regressed on one another in a way comparable to the cross-lagged panel model. These models can provide rich information about the over-time interdependencies

of variables in a way that can be reasonably be interpreted as causal in addition to the types of insights I have just reviewed about modeling influences of stability.

Using the Reinforcing Spirals Model as a Theory of Stability and Communication

The Reinforcing Spirals Model (RSM; Slater, 2007, 2015) is an existing theory of communication that accommodates thinking about stability as an outcome. Put briefly, the RSM argues for treating communication and constructs often treated as outcomes of communication (like attitudes and identities) as endogenous parts of a system. It serves to integrate media effects theories (in which communication is the independent variable and attitudinal variables like identity are outcomes) and selective exposure theories (in which attitudinal variables like identity are independent variables and communication is an outcome) by treating communication as both cause and effect. RSM further argues for taking cues from systems theory to manage that integration. Speaking speculatively, much of the heuristic appeal of the RSM to the average communication researcher is the explanation it provides for how some people become extreme in both their communication habits and attitudes. In systems language, this results from positive feedback loops in which communication causes more extreme attitudes, identities, and/or behaviors, which in turn cause more selective or frequent communication in the same domain.

As an example, among the studies that inspired the creation of this theory was one in which violent media exposure among adolescents appeared to increase aggressiveness while increases in aggressiveness also appeared to increase violent media usage (Slater et al., 2003). Such a pattern of results suggests the possibility of the positive feedback loops that characterize some of the theory's heuristic appeal. Empirically, studies that claim to be testing or implementing RSM are often panel designs in which communication (usually media exposure) and some attitude or other behavior both have positive coefficients for their effect on the other in

a cross-lagged panel regression model. Taken literally, such results imply ever-increasing extremity in both communication behavior and attitude; the epitome of instability.

Again taking on the language of the systems theory, Slater (2007) states that the norm is for the system to be self-regulating, rather than purely mutually reinforcing. In other words, usually people's identities and attitudes along with related communication do not become progressively more extreme over time. Instead, these are constructs that are expected to be quite stable. According to this logic, people typically keep things as they are. In fact, attitude-affirming communication is described as "maintenance" in the explication of the RSM, a term that captures the expected result: stability as the result of intentional behaviors. The systems explanation for why this is the case is that our social systems are usually open. In other words, a person is exposed to more than just ideas and activities that push towards existing identities and attitudes. One is also exposed to counterinfluences that call those identities and attitudes into question. Moreover, people are multi-faceted and experience the pull of other interests, identities, and so on. Once enough affirmation for one identity is achieved, rather than pursue it further and become more extreme, the norm is to move onto something else.

Take for example a person who identifies both as a political conservative and a running enthusiast. The desire to run, learn more about running, and talk with other runners are things that occupy time that might otherwise be used to intensify the conservative identity. Beyond the time and cognitive constraints of having multiple interests, the kinds of ideas one may be exposed to when spending time with fellow runners may be inconsistent with the group values of conservatives, which could serve to moderate the conservative identity as a response to the identity threat of countervailing information. The micro-level view of the process is basically that one's conservative identity gets a bit stronger after watching a congenial partisan news

program, but recedes an equivalent amount in the intervening time due to other factors before the next episode (or other pro-conservative communication) brings the identity strength back up to or slightly above normal. As in the case with a negative feedback loop, there are countervailing processes that effectively cancel each other out once equilibrium is reached. This implies there are indeed effects of media exposure and interpersonal conversations, but they tend to occur in a context in which the person uses them to *avoid* change. It would take a confluence of unusual factors to make increasingly extreme identity and communication levels the likely outcome.

This claim that these constructs tend to exist in a self-regulating system is an appealing one for several reasons. First, it applies the same type of logic to the processes that prevent change as it does for the processes that cause change. Second, it squares the theory with reality; most people, most of the time, in most domains do not have extreme attitudes, display extreme pro-group behavior, and do not engage in highly selective communication. Third, it explicitly theorizes about how and why key concepts will *not* change in a way that is amenable to empirical testing. This last point is important because one could come up with a theory that things do not change and, to test it, do run-of-the-mill media effects style statistical tests and claim null results as confirmation of the theory. The goal of this paper is to advance the ability to do theory testing in which these forces act in concert to cause stability. Many communication theories do not make predictions about stability and whether stability is dependent on something or just a default state.

Some research on the RSM — and that influenced the RSM — has focused on volatile parts of the lifespan, like aggression (Slater et al., 2003), smoking (Slater & Hayes, 2010), and political interest (Moeller et al., 2018) during adolescence. These are times when the positive feedback loops are most likely to be observed since there is inherent instability in these

constructs at this stage of psychosocial development (e.g., Jennings & Markus, 1984). In this way, one can see the reinforcing spirals as a mechanism for political (or other kinds of) socialization. Most of the time, except when populations are selected specifically for their life stage or other circumstance that is expected to be particularly volatile, people who will be studied have presumably already reached a relative equilibrium. Although there may always be some people subject to the positive feedback processes, a typical adult will be in a state of relative stasis. This could be why, for instance, a study trying to connect local news use and community attachment failed to find evidence of a causal relationship between the two despite a meaningful cross-sectional correlation (L. H. Hoffman & Eveland, 2010). It may be the case that adults who are well-established in a community have reached that equilibrium and to detect the expected relationship, the sample would need to target people who have recently moved.

Decay

The RSM provides an elegant explanation for why extremity is not the norm: People have multiple interests and identities and even when those may be more or less aligned, they still live in a social context rife with moderating forces that exist in a diverse society. But as may have been apparent in the example of the conservative running enthusiast, it can become difficult — even in a hypothetical scenario — to enumerate precisely what will cause one's identity to moderate in between identity-relevant communications. If a person never engages with politics except watching a weekly program, it would be hard to say within the RSM what happens during the week that is not related to politics that would stop the ideological identity — and the appetite for more pro-ideology communication — from growing more extreme with every airing of the program. And yet if I stipulated that a person identified with conservatives ignored politics except for a once-weekly partisan TV show, it is doubtful many scholars of political

communication would expect such a person to be on a clear path to highly-selective partisan selective exposure and a very strong identity because the baseline level of communication seems too low.

Even in the absence of threat, identities and attitudes may have a "use it or lose it" quality. In other words, there is an inherent need to engage in attitude-affirming activities, like communication, to maintain their strength. This claim does not seem to have been tested or even proposed in prior research, but it can provide a simpler (or simplified) explanation for why and how communication and attitudes ultimately self-regulate rather than spiral under normal circumstances. The idea is that identities and attitudes inherently need active maintenance rather than maintenance only being needed because of persistent threats brought on by external forces or competing identities. Without any affirming activities, it is hard to believe a person could continue to hold a strong attachment. In the previous example, the reason one does not read this hypothetical person as at risk for a positive feedback loop is because a person who engages with politics so infrequently is very unlikely to perpetually increase the strength of their identification even if there are no obvious threats to the identity to confront. I refer to this temporal aspect as decay, or a basic tendency for attitude and identity strength to trend towards zero absent any affirming behavior.

This is consistent with Slater's (2015) invocation of chronic accessibility (Fazio et al., 1989) as an outcome of media selection. It also may be a cause insofar as the attitude accessibility tradition shows accessibility can sometimes *cause* attitude strength (Roese & Olson, 1994), especially when closely linked with identity (Boninger et al., 1995). Another cognitive explanation for why this might occur and why it would lead to communication comes from self-verification theory. A person engaging in self-perception (Bem, 1972) may question the accuracy

of their self-concept if that self-concept includes a social identity that plays an insufficient role in daily life. Affirming communication, then, can bring the self-concept back in line with reality. In the self-verification perspective, such communication would usually be preferable to changing the self-concept.

Identity maintenance is needed, in this view, to counterbalance decay and keep the identity as part of the self-concept. How much is needed? This is likely related to the strength of identity. By way of analogy, consider the physical law that an object cools faster when it is much hotter than the ambient environment. The rate of decay for a social identity may be similar: the stronger the identity, the more identity maintenance is needed to counterbalance the inevitable decay. People reach an equilibrium in which their media use and social contacts are just identity-consistent enough to counterbalance the decay. This can make for an easier explanation of why people, obviously limited in their ability to self-assess and plan out their behaviors, can manage to reach equilibrium. If identity strength is subject to constant decay, and identity-affirming communication is stable and exerts a constant effect, then the strength of identity will naturally settle at whatever level that results from the combination of decay and affirmation. There are certainly some individual differences that will determine the rate of decay and the dose-response to communication, but speculating on the many possible causes of them is outside the scope of this paper.

This has ramifications for how threats to valued identities and attitudes are managed. Those who have a strong identity and already have established a pattern of identity-affirming communication to maintain that identity have that communication to fall back on when identity threat occurs. Threatening information relevant to the identity should only have spillover effects on strength of identification when it cannot be managed in some other way. The persistent use of

identity-affirming communication helps to ensure a speedy return to one's norms in terms of collective self-esteem, thereby protecting the strength of identification. The weakly identified, who engage in less identity-affirming communication, are more likely to have to resort to reducing their group identification to manage the dissonance. Some people will change their media use and social contacts to manage threat, but the observed stability of the constructs suggests these may not be the typical strategies.

Suggested here is a small change to the RSM. To the extent the theory has faced any criticism — at least in public — it has focused on the problem of how stable media use and identity are (Scharkow, 2017, 2019). By assuming identities have a natural tendency to decay in strength without affirmation, there is a theoretical basis for why communication can be unchanging in a dynamic system: it exerts a constant identity-reinforcing effect that counterbalances a constant identity decay. Decay can also simplify the RSM, making it easier to study RSM claims in the context of a single attitude or identity and without the need for enumerating threats. As currently constructed, RSM argues the need for identity maintenance is rooted in frequent identity threats — probably minor in severity — that exist in an open system. It also suggests one of the important countervailing forces that prevents positive feedback loops is the fact people tend to have multiple identities that may compete for time and have internal contradictions. It is likely correct that these play that role, but this slight reconfiguration makes these explanations no longer necessary conditions for the avoidance of positive feedback loops. One can assume that any time not spent maintaining a given identity comes at a (potentially small) cost to that identity. Specific threats to the identity can be enumerated, but it is not necessary in this simplified model.

Conclusion

Many important debates and findings in communication research make claims or assumptions about the stability of communication, attitudes, and behavior. Typical research designs, however, make it difficult to test those claims empirically. This, combined with a norm to understand "effects" to mean changes in attitudes or behavior, has led to relatively little research about how communication may cause stability in other variables (or other variables may cause stability in communication). As demonstrated, researching stability empirically is not simple and requires both a more nuanced understanding of types of variability and research designs that can be demanding for certain kinds of subjects and measurements. As in many cases in quantitative research, conceptualization and operationalization are closely related and it is difficult to speak about one without the other. Potential rewards, however, are significant given how little the discipline has systematically explored questions about stability. A useful starting point for some research questions would be the Reinforcing Spirals Model, but in time it is likely that other models and theories will emerge.

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