Double-Loop Learning and Productive Reasoning: Chris Argyris's Contributions to a Framework for Lifelong Learning and Inquiry

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ABSTRACT

This article reviews social scientist and organizational researcher Chris Argyris's publications from the 1970s through the 2000s about organizational learning. In his role as an action scientist and consultant, working to facilitate learning in organizational contexts and drawing on earlier work in psychology from John Dewey and Kurt Lewin, Argyris developed his "theory of action" perspective on learning and interpersonal inquiry. According to Argyris, learning involves increasing the effectiveness of our actions so as to produce the intended results. He argued, however, that we are often unaware of the extent to which our actions *inhibit* learning in social contexts. Argyris sought to identify defensive routines that inhibit learning at the individual, group, intergroup, and organizational levels and promoted a shift from single-loop to double-loop learning and from defensive (Model I) to productive (Model II) reasoning. In this article, based on Argyris's work, I construct a general framework of principles and action heuristics for lifelong learning and inquiry, applicable across organizational, professional, and everyday contexts. After reviewing basic concepts of Argyris's theory of organizational learning, I identify principles and strategies for individuals seeking to develop in themselves, as well as to promote in others, an orientation of general lifelong learning and inquiry.

KEY WORDS Theory of Action; Double-Loop Learning; Productive Reasoning; Action Science; Lifelong Learning

Learning remains important throughout our lives (Noon 2017). Especially today, in an increasingly fast-paced and globally connected world, we must constantly adapt to change (Senge 2006). Technological changes, especially the internet and social media, have brought an explosion of information and an acceleration of its spread. With increasing globalization, we interact more often with others who have different cultural

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and moral perspectives (Greene 2013; Hofstede, Hofstede, and Minkov 2010). Professionally, we face seemingly endless demands to learn new knowledge and skills (Korunka et al. 2015), and as citizens, we are flooded with information mixed with "fake news" and "alternative facts," requiring us to determine what is important, relevant, and valid. For humans, learning is a part of living (Wenger 1998); however, these changes require that we learn more intentionally. Such intentional learning is no longer only for children or students; it must be a lifelong endeavor.

This article is part of a broader project exploring diverse multidisciplinary perspectives on lifelong learning. New and varied perspectives or theoretical frameworks can provide deeper understanding, with each perspective highlighting different aspects of a conceptual domain (see Kuhn 2012; Lakoff and Johnson 2003; Senge 2006). The focus here is on the scholarly work of Chris Argyris (1923–2013). Argyris contributed to the organizational sciences—including organizational psychology, organizational behavior, and management science—from the 1950s through the 2000s (see Argyris 2003). In the 1970s, he began collaboration with Donald Schon and others to develop a "theory of action" perspective on organizational learning, with an emphasis on interpersonal dimensions of learning and inquiry in organizational contexts. A key claim of this article is that Argyris's ideas are relevant for learning beyond more stable organizational contexts and can provide a useful framework for lifelong learning and inquiry.

This theory of action perspective emerged as part of a broader action science that built upon the work of John Dewey and Kurt Lewin (Argyris, Putnam, and Smith 1985). These theorists argued that science should not simply describe the status quo but should promote practical inquiry that can contribute to producing a better, more democratic and learning-oriented, society. Dewey explored the intersections of education, science, and democracy, and he sought to integrate education with everyday living and democratic citizenship. For Lewin, theories were to be practical and social problems (e.g., prejudice, aggression) were best understood by designing actions to try to change them (Argyris 1993).

Traditional theories of learning in psychology have focused on individual learners. In behavioral theories, learning is understood largely in terms of behavioral changes resulting from environmental contingencies of reinforcement and punishment. In contrast, cognitive theories have emphasized knowledge acquisition, information processing, and knowledge construction. Several well-known theories specifically addressing adult or lifelong learning have also reflected this focus on the individual learner. Examples include David Kolb's theory of experiential learning and Jack Mezirow's theory of transformational learning. For Kolb (1984), learning occurs as individuals engage in cycles of concrete experience, reflective observation, abstract conceptualization, and active experimentation. For Mezirow (1997), adult learning involves developing autonomous thinking through critical reflection and evaluation of the assumptions and frames of reference that define our world views.

Other theories, such as those of Lev Vygotsky and Etienne Wenger, have emphasized learning in a broader sociocultural context. Vygotsky (1978) studied the social and cultural origins of higher mental processes. In Vygotsky's theory, cognitive development occurs as individuals learn to use cultural tools, with the help of more-

skilled cultural members. For Wenger (1998), learning is an aspect of social participation in communities of practice, consisting of individuals with shared interests who interact as they develop shared knowledge, perspectives, and identities. Although these theories provide significant contributions to our understanding of learning in a sociocultural context, Argyris's approach is distinguished by his detailed analysis of how the values and strategies that shape our conversations can enhance or inhibit learning in organizational contexts.

Argyris's work is likely familiar to many within the organizational sciences but not to a more general audience. His ideas seem relevant today for learning across broader society, however, as individuals seek personal growth and professional development and engage in collaboration and democratic citizenship. Hence, this paper has three goals. First, it aims to provide a general overview of Argyris's theory of action perspective that integrates ideas from across his large volume of work. Second, it seeks to present these ideas for a wider general audience and as relevant for a broader range of contexts beyond organizational settings. Finally, it organizes Argyris's ideas in a new framework of principles and action heuristics, relevant for facilitating lifelong learning and inquiry, individually and collectively, across everyday and professional contexts.

THE THEORY OF ACTION PERSPECTIVE

Argyris and Schon (1974, 1996) account for deliberate human behavior in terms of theories of action. In their view, humans design actions so as to be effective—that is, to achieve desired or intended consequences. Because real-life situations are complex and the human mind has limited information-processing capacity, humans use theories of action to decide what to do. These theories take the form "In situation *S*, if you want to achieve consequence *C*, do *A*" (Argyris and Schon 1974:5). They vary in terms of their generality. Whereas "microtheories" relate to specific situations, general "master programs" guide action design across a broad range of circumstances. For actors, theories of action are prescriptive, stating what a person should do to achieve desired results. For observers, these theories are used to explain observed behaviors or predict future behaviors in others (Argyris and Schon 1974, 1996).

There are two types of theories of action: espoused theories and theories-in-use. Espoused theories are stated explicitly to explain or justify what we say and do. In contrast, theories-in-use are the theories that actually govern our actions. Our espoused theories and theories-in-use are often incongruent, and we are often unaware of this fact. For example, individuals may say they value health, justice, and truth yet design actions to avoid exercise, maintain discriminatory policies, and cling to comfortable but unsupported beliefs. We can reveal espoused theories by asking individuals why they do what they do. Theories-in-use, however, are usually implicit or tacit; thus, they can only be inferred from observable patterns of behavior (Argyris and Schon 1974, 1996).

Argyris and Schon (1974, 1996) relate the distinction between theories-in-use and espoused theories to that between tacit and explicit knowledge of skilled performance. We can perform tacit skills, such as recognizing a face or riding a bike, without being able to explain how. Conversely, we can learn an explicit description of how to do

something without being able to implement it. Grammar provides another analogy (Argyris and Schon 1974:11). We learn the grammar of our native language tacitly as we internalize patterns from listening, practice, and feedback. Only later do some of us learn an explicit grammar to describe, at least partly, these patterns. This process may be reversed in learning a second language as we try to internalize an explicit theory.

Theories of action are composed of governing values, action strategies, and their consequences (Argyris 1982, 1993; Argyris and Schon 1974, 1996). A field of governing values (or variables) defines how actions should be designed for intended effect. We design actions to satisfy these governing values, to achieve our primary objectives while keeping other governing variables (e.g., anxiety, effort) in acceptable ranges. Actions are ineffective if they do not achieve their intended consequences or if they have undesirable side effects. Value conflicts can create dilemmas, where actions that raise one variable lower another. For example, a desire to learn may conflict with desires to maintain world-view stability or not upset others. Acknowledging these inconsistencies may threaten our self-esteem or sense of competence (Argyris and Schon 1974, 1996).

As an example, consider a professional seeking to keep up to date in their field by attending conferences. Such an action strategy will be judged effective to the extent it achieves its primary objective, professional learning. If other governing variables, such as cost, time, or safety concerns (e.g., due to a pandemic), however, fall outside of acceptable ranges, the likelihood of the professional attending the conference could be reduced. Dilemmas arise as values, such as learning versus cost, conflict. Other reasons for the professional attending the conference could include networking or visiting a new city. If someone says they are attending the conference to learn but then skips conference sessions to socialize with friends or visit tourist attractions, this is evidence that the person's espoused theory and theory-in-use are incongruent.

Learning for Effective Action

Argyris and Schon (1996) base their view of learning on John Dewey's pragmatic conception of inquiry. For Dewey, as actors engage in the world, they encounter problematic situations in which expectations differ from results. These situations create doubt, which stimulates inquiry into new ways of thinking and acting to resolve this doubt. As one problem is resolved, new problems often arise, and inquiry continues. Dewey also viewed inquiry as a social process, conducted with others according to rules and norms established within a "community of inquiry" (Argyris and Schon 1996:33).

In the theory of action perspective, learning is a form of inquiry that leads to more effective action. Effective action occurs when an action achieves its intended results, and these results persist without other undesired consequences. Learning then involves the detection and correction of errors (mismatches between intended and actual results) so as to increase competence—our capacity for sustained effective action (Argyris and Schon 1974, 1996). A learning cycle consists of four stages: (1) discovery (of a problem/error), (2) invention (of a solution/correction), (3) production (of the invention), and (4) evaluation (of the production) or generalization (to other settings; Argyris 1976a, 1982).

When we recognize errors, we can change our action strategies or the governing values and assumptions behind these strategies. This is the basis for Argyris's distinction between single-loop and double-loop learning. Single-loop learning involves changing our action strategies so as to better satisfy existing values. Double-loop learning goes deeper by also examining these values and their prioritization, as well as any underlying assumptions. The classic example is a thermostat (Argyris and Schon 1974, 1996). A thermostat set at 68 degrees "acts" to maintain this preset temperature, using existing heating mechanisms. This reflects single-loop learning. Double-loop learning would entail asking what the temperature should be set at or if there is a better means of adjusting the temperature. A human example is someone faced with unanticipated conflict. Whereas a single-loop learner might try a new strategy to avoid the conflict, a double-loop learner could consider shifting priorities to use the conflict productively to promote learning by considering diverse viewpoints (Argyris and Schon 1974).

Although we typically think of learning as a task for individual learners, Argyris and colleagues extend the concept of learning to group, intergroup, and organizational levels. These higher-level entities can learn when they are organized for collective decision-making and acquire knowledge to enhance their capacity for effective collective action. According to Argyris and Schon (1996:16), organizational learning occurs "when individuals within an organization experience a problematic situation and inquire into it on the organization's behalf." Organizational knowledge (or memory) resides in the organization's structures, procedures, routines, norms, practices, and databases as well as in the collective memories of its members. In an increasingly complex and competitive world, it is widely recognized that an organization's sustained success depends on its ability to learn (Argyris 1991, 1999; Argyris and Schon 1978, 1996; Senge 2006).

Model I Theories-in-Use

In their work as researcher-interventionists, Argyris and colleagues diagnosed theories-in-use across a range of business, governmental, and educational contexts (Argyris 1976a, 1982, 1985, 1990, 1993, 2000; Argyris et al. 1985; Argyris and Schon 1974, 1996). Through helping clients write and discuss case studies of real-life problematic issues, they identified a general theory-in-use that they called Model I. Model I was found to be nearly universal, especially when individuals confronted challenging issues in interpersonal contexts with the potential for embarrassment or threat. Although espoused theories and specific behaviors varied, a Model I theory-in-use was shared across settings and demographic groups (e.g., age, gender, race/ethnicity, culture, education, social status). It appears that Model I is learned through socialization in childhood and is later reinforced throughout society. Most of us typically remain unaware of our use of Model I and how it limits our learning, however.

Model I reflects a desire to maintain unilateral control of the task and of others while protecting ourselves, and often others, from embarrassment or threat. Specifically, Argyris and Schon (1996:93) identified four Model I governing values: (1) "define goals and try to achieve them," (2) "maximize winning and minimize losing," (3) "minimize generating or expressing negative feelings," and (4) "be rational." When designing actions

based on these values, individuals establish goals and work to achieve those goals, without trying to collaborate with others to develop shared goals or possibly reframe the task. They advocate their ideas to persuade others, without encouraging inquiry (e.g., asking for feedback or alternative views). If they are successful and achieve their goals and/or persuade others, they consider it a win (which may mean others must lose).

People acting in accord with Model I use action strategies aimed at maintaining control while protecting themselves and others. This includes trying to be rational (i.e., objective, unemotional) and suppressing negative feelings. In Model I, being upset is viewed as a sign of weakness or incompetence. Moreover, upsetting or offending others is considered impolite (and risky if there are power differences). As a result, individuals often engage in defensive behaviors, such as denial, avoidance, and face-saving (e.g., withholding criticism, "smoothing over" negative reactions), to protect themselves and others from embarrassment and threat (Argyris and Schon 1974, 1996).

When someone is acting according to Model I, control and protection take priority over valid information, free and open inquiry, and learning. A common result is that information is withheld, distorted, or stated ambiguously. Individuals may conceal or distort their intentions and withhold information to maintain the upper hand, what Argyris and Schon (1996:94) call mastery through mystery. Assumptions, evaluations, and attributions are kept hidden, to avoid risk of error or embarrassment, or are stated abstractly, without being illustrated with concrete examples. Such high-level inferences (e.g., "her work was pretty good" or "he is not trustworthy") reduce one's vulnerability to being challenged or held accountable on specifics; however, they also create ambiguity. Individuals may additionally suppress feelings and censor negative feedback to be diplomatic or polite and to not upset others (Argyris 1982, 1993; Argyris and Schon 1996).

A Model I theory-in-use further inhibits the production of valid information because it causes individuals to avoid publicly testing assumptions and inferences; if testing occurs at all, it is usually private. This can lead to misunderstanding, error escalation, and self-sealing processes. Reasoning is self-sealing when assumptions, attributions, and evaluations are maintained without being subjected to attempts at disconfirmation (Argyris 1982, 1985, 1990, 1993; Argyris and Schon 1996). For example, a person may not challenge others because of the untested assumption that others cannot handle criticism (e.g., "I can't question his views, or he will explode"; Argyris 1993). These self-sealing processes can become self-fulfilling. To illustrate, if A believes B is defensive and acts cautiously toward B, B is also likely to act cautiously toward A, seemingly confirming A's prior belief (Argyris and Schon 1974:77). In Model I, without prioritizing valid feedback and public testing of ideas, open inquiry and learning (especially double-loop learning) are significantly inhibited (Argyris and Schon 1996).

Model I Limited Learning Systems

Theories of action have consequences for the behavioral patterns that arise as we interact with others. At an organizational level, individuals' theories-in-use help create learning systems that include these behavioral patterns and organizational structures (e.g., information and incentive systems) that influence learning and inquiry in an organization.

Such systems can enhance or inhibit learning, depending on whether they encourage or discourage confrontation of important issues and dilemmas and the public testing of inferences and assumptions (Argyris and Schon 1974, 1978, 1996).

Individuals with Model I theories-in-use tend to create groups and organizations with similar Model I norms and practices that further reinforce their Model I theories-in-use. This results in what Argyris and Schon (1996:90) called organizational limited learning systems, with self-reinforcing processes that inhibit organizational learning. These limited learning systems are characterized by organizational defensive routines—organizational norms, policies, and practices designed to eliminate embarrassment or threat while also avoiding the embarrassment or threat's underlying causes (Argyris 1985, 1990, 1993; Argyris and Schon 1996). These Model I defensive routines, including self-censorship, ambiguous messages, blame of others, and face-saving behaviors, affect one's behavioral world. Individuals' attempts to maintain unilateral control and to win produce competitive group dynamics, with intergroup (e.g., departmental) rivalry, polarization, and political games of deception. Self-censoring, face-saving, and self-sealing processes create an environment characterized by mistrust, lack of openness, conformity, and risk aversion (Argyris 1982, 1985, 1990; Argyris and Schon 1996). This can increase defensiveness and can further reinforce Model I theories-in-use and strategies.

Such defensive and competitive dynamics have significant implications for learning. When the goal is protection and control, rather than learning and open inquiry, people typically either remain blind to errors or do not acknowledge them publicly. Defensive routines inhibit learning, as errors are bypassed to avoid embarrassment or threat, and this bypass is covered up (moreover, the cover-up is covered up). People hide ambiguity, conflict, self-censorship, inconsistencies, and ineffectiveness from themselves and/or others through layers of defensive camouflage. Norms then develop against discussing these issues openly (Argyris 1985, 1987, 1990, 1993).

The consequence of bypass and cover up is that discussions are superficial, especially for important and challenging topics. Individuals avoid stating what they really think, and threatening issues become "undiscussables." Moreover, the undiscussability of these issues also becomes undiscussable, as individuals avoid confronting defensive routines for fear of opening a "can of worms" that could make things worse. What learning does occur is likely to be single-loop, but rarely double-loop, as questioning existing values, assumptions, and norms is deemed too risky (Argyris 1982, 1985, 1990, 1993).

Defensive routines thus become resistant to change—even when such change is desired—for two reasons. First, these routines are well-learned skilled actions, applied automatically and unreflectively based on a taken-for-granted Model I theory-in-use. This results in what Argyris (1986, 1990) called skilled incompetence, in which we become experts at acting in ways that inhibit learning and maintain ineffectiveness. Second, attempts to interrupt or confront defensive routines activate (and further reinforce) these routines. This can lead to "fancy footwork," in which, according to Argyris (1990:46), individuals "use all the defensive reasoning and actions at their command in order to continue the distancing and blindness without holding themselves responsible for doing so." Individuals may feel caught in a double bind: continue with ineffective strategies or risk raising threatening issues (Argyris 1990, 1993). As bypass and cover-up routines

escalate, they may be accepted as natural and inevitable, leading to cynicism, further mistrust and distancing, and a sense of helplessness (Argyris 1990:30).

Toward Model II Theories-in-Use and Productive Learning Systems

Is there an alternative to Model I? In response to this question, Argyris and colleagues sought to help their clients and students develop a Model II theory-in-use that would promote effective learning. They identified Model II governing values as valid information, free and informed choice, and internal commitment (Argyris and Schon 1996:118). Model II emphasizes "the norm of responsible belief" (Argyris et al. 1985:265). Individuals acting according to a Model II theory of action seek useful and relevant information based on verifiable (i.e., directly observable) data and publicly tested inferences. They strive to create contexts in which they and others can make choices that are free (based on their values, beliefs, and desires) and informed (based on relevant valid information) and to which they are internally committed. Internal commitment includes acceptance of personal responsibility for one's choices and for monitoring their implementation. These values are interconnected: Valid information supports informed choice, free choice fosters internal commitment, and commitment motivates individuals to seek valid feedback for further learning (Argyris and Schon 1974, 1996).

Model II avoids the unilateral control and protection strategies associated with Model I, as these actions can deprive people of valid information and free choice. Instead, Model II action strategies emphasize crafting statements so as to encourage inquiry and public testing (Argyris 1982, 1993; Argyris and Schon 1996). Responsibility for defining goals and framing the task is shared, to support free choice and internal commitment. Whereas Model I results in defensive reasoning, Model II promotes productive reasoning. As described by Argyris (1993:56), productive reasoning includes illustrating claims with directly observable data, making inferences explicit, encouraging inquiry into one's views, and seeking disconfirmation through public testing. Although both Models I and II use advocating, attributing, and evaluating, the latter combines these with illustrating, testing, and inquiring.

Model II provides a basis for creating productive organizational learning systems that minimize defensive routines, support free and open inquiry, engage embarrassment and threat, and promote double-loop learning (Argyris 1993:54). Just as Model I strategies reinforce Model I values and norms, Model II strategies reinforce Model II values and norms. With the latter, there is a shift from competitiveness, mistrust, manipulation, and concealment to cooperation, trust, free choice, and open inquiry. Model II is not self-sealing, as it promotes double-loop learning; its governing values, action strategies, and consequences can be openly discussed. Individuals are committed to their views, but they are also open to having their views tested and challenged by others (Argyris and Schon 1974:91). Learning occurs as individuals publicly test ideas, "surface" threatening issues, consider alternative views, and risk making mistakes.

Model II specifically supports double-loop learning by providing a context for open discussion of difficult issues and dilemmas. An important difference from Model I is in how individuals react to conflict and negative feelings. With Model I, individuals often

avoid conflict, and when frustration builds, they may explode in unproductive ways. With Model II, conflict and feelings of threat or frustration can be explored and tested by others. Although conflict is not necessarily reduced, individuals should have better strategies for discussing it, as well as more confidence that they can address conflict productively so as to promote learning (Argyris et al. 1985). Trust is developed not by being overly protective or positive but by committing to learning and to Model II values (Argyris 1993).

Model II inquiry is most needed for complex and uncertain situations, in which such confidence and trust are needed because of the higher potential for conflict, embarrassment, and threat. Learning Model II is difficult, however, even for the highly motivated and learning-oriented. Many people espouse Model II values, but few internalize them as a theory-in-use. Use of Model II strategies will likely trigger defensive routines, as individuals' sense of competence may depend on their comfort with the skillful use of Model I. Gaining awareness of this skilled incompetence, however, provides opportunities for reflection and inquiry. To promote learning, defensive routines must be interrupted and undiscussables must be made discussable. Individuals need practice to develop the capacity for double-loop learning and to move Model II from an espoused theory to a theory-in-use (Argyris 1982, 1990; Argyris and Schon 1996).

IMPLICATIONS FOR LIFELONG LEARNING AND INQUIRY

The theory of action perspective suggests that lifelong learning and inquiry can be promoted by shifting emphasis from Model I to Model II theories and learning systems. Based on a review of 15 books and more than 40 articles by Argyris, four theory of action principles have been identified as a framework for lifelong learning and inquiry. Each principle is linked with two action heuristics to guide its effective implementation (Table 1). A key claim of this article is that these principles and heuristics have relevance for promoting learning and inquiry not only in organizational settings but also in other professional and everyday interactions as we seek to learn collaboratively with others.

Table 1. A Framework for Lifelong Learning and Inquiry

General Principle	Action Heuristics
COMMIT to a learning orientation	1. Promote double-loop learning
	2. Choose Model II values
SURFACE learning inhibitors	3. Evaluate theories-in-use
	4. Identify defensive routines
DEVELOP productive reasoning	5. Illustrate and test inferences
	6. Combine advocacy with inquiry
PRACTICE and redesign actions	7. Reframe errors as learning opportunities
	8. Engage in reflective experimentation

Committing to a Learning Orientation

In the theory of action perspective, a learning orientation entails committing to double-loop learning and a Model II theory-in-use, which support each other and should be pursued together. Double-loop learning is necessary for consideration of new Model II values that can enhance learning and effectiveness. Conversely, a Model II theory-in-use is needed to promote a sustained capacity for double-loop learning, especially under conditions of potential embarrassment or threat (Argyris and Schon 1996).

     Heuristic 1: Promote double-loop learning. Most individuals are skilled at single-loop but not double-loop learning (Argyris et al. 1985). Single-loop learning, aimed at achieving objectives based on existing values, assumptions, and norms, may be sufficient for routine tasks (Argyris and Schon 1974), but more challenging issues call for double-loop learning, in which values, assumptions, and norms can be reconsidered through personal and collaborative reflection and inquiry. According to Argyris and colleagues (1985), such inquiry is needed to explore "liberating alternatives" that challenge the status quo, including taken-for-granted norms, values, and beliefs.

     We can also direct double-loop learning toward learning itself, by questioning underlying values, assumptions, and norms that influence learning. Argyris and Schon (1996) called this deuterolearning (or "second-order learning"). Here, we reflect on and inquire into how our theories-in-use and learning systems inhibit or enhance learning. For example, rather than avoiding errors and protecting ourselves from embarrassment, we can try risking mistakes in order to create learning opportunities. A theory of action perspective encourages us to commit to "learning how to learn" for greater effectiveness.

     Heuristic 2: Choose Model II values. Most individuals lack competence in double-loop learning and find it threatening. They have become experts at designing actions, based on a Model I theory-in-use, in ways that inhibit learning (Argyris 1976b, 1982, 1993; Argyris and Schon 1996). Efforts to engage in double-loop learning are thus not likely to be sustained without a new theory-in-use that supports such learning. Meaningful change requires shifting to a Model II theory-in-use that prioritizes valid information, free and informed choice, and internal commitment, and in which strategies, values, group processes, and norms are all open to criticism (Argyris 1982, 1993).

     Argyris and Schon (1974:97) claimed that Model II values are often espoused but rarely acted upon. For example, individuals may espouse commitment to truth but act as if they value truth only when it is not threatening (Argyris 1990). A learning orientation thus involves more than just an explicit acceptance of Model II; individuals must commit to enacting a learning orientation as a theory-in-use ("walking the talk"). This is challenging, as it requires new values and skills and the individual often receives little support from others. Nonetheless, an espoused Model II theory of action can define an ideal toward which individuals strive and a standard for evaluating progress toward greater capacity for learning and inquiry.

     Model II also requires a change in the meaning of social values or virtues, such as concern and respect for others (Argyris 1990; Argyris and Schon 1996). Most individuals learn Model I meanings of these values in childhood that perpetuate defensive reasoning

and inhibit double-loop learning. In a Model I world, we demonstrate concern and respect for others by helping them feel good and using face-saving behaviors to protect them from embarrassment and threat. We may offer praise and approval while minimizing criticism and conflict so as not to upset them. Social norms dictate that we be polite and diplomatic and avoid confronting others, even when we disagree, to protect them from hurt feelings (Argyris 1982, 1990; Argyris and Schon 1996). In Model II, the goal of concern and support shifts from making individuals feel good to helping them reason productively and learn. Respect is demonstrated not by agreeing with or deferring to others but by interacting with them as if they are capable of such reflection and inquiry.

Strength and integrity are also reframed in a shift to Model II. In Model I, these values are associated with control; strength involves advocating and winning, and integrity occurs by maintaining consistent values and principles. Errors, inconsistencies, and feelings of vulnerability, considered to be weaknesses, are hidden and kept private (Argyris and Schon 1978). The cost, however, is inhibition of both learning and good performance. In Model II, strength is not winning by advocating a position strongly but occurs by encouraging inquiry and being vulnerable to errors, and integrity does not mean being consistent ("sticking to" your beliefs and values) but means making choices based on valid information and open inquiry (Argyris 1990; Argyris and Schon 1996).

Surfacing Learning Inhibitors

Double-loop learning requires changing our Model I theory-in-use and the limited learning systems that are created by and, in turn, reinforce it (Argyris 1982, 1990, 1993). Most individuals continue to employ defensive routines and a Model I theory-in-use even when espousing Model II values; however, becoming aware of (or "surfacing") this incongruence through reflection and inquiry can motivate learning. Given that many individuals have difficulty reflecting in action, it is often necessary at first to slow down the process and reflect on actions (including what we say) after the fact. Further, most people recognize ineffective action more easily in others than in themselves. Thus, collaborating with others who are able to offer constructive feedback can help surface learning-inhibiting theories-in-use and defensive routines (Argyris 1982, 1993).

Heuristic 3: Evaluate theories-in-use. Although a theory-in-use need not be stated explicitly to be effective, such explication is important for critical reflection, theory testing, and considering alternatives (Argyris and Schon 1974, 1996). Theories of action can be judged in terms of their effectiveness in producing intended results and the value of the learning systems they help create. When assessing our actions (what we *actually* say and do), we can ask, "Are we promoting our own learning and learning in others?"

Three additional criteria for evaluating theories of action are internal consistency, congruence, and testability (Argyris and Schon 1974). Internal inconsistencies arise from contradictions among governing values. For example, someone who values learning but also values minimizing effort or avoiding mistakes or conflict may find it difficult to achieve these simultaneously. Incongruence refers to mismatches between espoused theories and theories-in-use. This typically involves

espousing Model II values while acting according to Model I. Finally, without testability, assumptions and inferences can be self-sealing (maintained without attempts at disconfirmation). These criteria can reveal dilemmas, in which desires for learning and effective action conflict with desires for theory constancy or error avoidance. When surfaced, inconsistencies and dilemmas can motivate learning.

Heuristic 4: Identify defensive routines. Defensive routines aim to protect individuals from potential embarrassment or threat, but they also inhibit learning, as errors, inconsistencies, and dilemmas remain unrecognized or unacknowledged. In Argyris's (1993:15) words, these routines are "antilearning and overprotective." To overcome defensive routines, we must first become aware of our use of them and of how they inhibit learning and reduce our effectiveness.

Common defensive routines identified by Argyris and colleagues are presented in Table 2. Routines such as unilateral advocacy, self-censoring, self-referential logic, and fancy footwork inhibit public testing of ideas and inquiry into alternative views (Argyris 1982, 1990; Argyris et al. 1985). Distancing may succeed at self-protection, but it eliminates opportunities for learning and for examining one's responsibility for defensive routines. Face-saving behaviors, such as "easing in" and "rescue moves," do not help others confront, learn from, or take responsibility for their errors and are often based on the untested assumption that others need protection. Moreover, if people are given distorted (e.g., incomplete or overly positive) feedback, they will learn not to trust feedback. Thus, these behaviors can contribute to Model I limited learning systems that inhibit learning.

Developing Productive Reasoning

Once individuals commit to learning-enhancing Model II values and become aware of learning-inhibiting Model I theories-in-use and defensive routines, they still need to be able to invent and produce Model II action strategies. Individuals may want to talk openly and constructively about issues yet not have the skills or confidence to do so (Argyris 1990, 1993). Thus, a learning orientation requires developing the capacity for productive reasoning, which includes illustrating and testing inferences and combining advocacy with inquiry. These action strategies must be based on Model II values.

Heuristic 5: Illustrate and test inferences. With Model I, high-level inferences are often formed automatically and accepted as obvious. Self-censoring often involves being secretly judgmental. Defensive reasoning is the norm, and many claims are not illustrated or tested. In contrast, with Model II, productive reasoning prioritizes valid information in a context that supports free choice and internal commitment. To achieve this, individuals should avoid private untested assumptions, attributions, and evaluations and should instead clearly state their assumptions and inferences, illustrate claims with directly observable data, and make their reasoning explicit. This allows others to examine what would otherwise be left unstated and untested (Argyris 1982, 1985, 1993).

The ladder of inference provides a useful metaphor for making reasoning explicit and examining the data and reasoning on which inferences are based. As presented by

Argyris (1982, 1993), the bottom rung on the ladder represents directly observable data, the second rung represents culturally accepted meanings, and higher rungs reflect more personal or abstract meanings. The higher up the ladder you go, the farther removed inferences are from publicly verifiable data and the more likely they are to produce disagreements based on different reasoning processes or interpretations of the data.

For example, suppose that in a meeting, after presenting a new initiative, you conclude that your colleague will not support it. Using the ladder of inference, you could state that this inference is based on your colleague's frown and lack of comments during the meeting, which you interpreted as her rejecting what you proposed. If you make this reasoning public, it can be tested. Perhaps she was frowning at someone else or was preoccupied with a personal issue, or maybe she had concerns about a minor issue but overall thinks the initiative has promise. Using this tool, misunderstandings can be clarified, gaps in reasoning can be examined, disconfirming data can be provided, and alternative interpretations can be explored (Argyris 1993; Argyris and Schon 1996).

Table 2. Common Defensive Routines

Defensive Routine	Brief Description
Unilateral advocacy	Stating views without encouraging open inquiry, confrontation, or alternative perspectives
High-level inferences	Making general or abstract assertions not illustrated with or tested against directly observable data
Self-censoring	Keeping assumptions and inferences private in order to protect oneself and others from embarrassment or threat
Distancing	Avoiding errors, inconsistencies, or potential threats, as well as responsibility for their continuation
Self-referential logic	Claiming that inferences are valid based solely on one's own reasoning processes (e.g., "Trust me, I know.")
Mixed messages	Stating inconsistencies/ambiguities that are not acknowledged (e.g., "Do what you think is best, but be careful.")
Easing in	Asking questions to lead others to understand what you don't want to say explicitly, in an attempt to protect them from negative feedback
Rescue moves	Redirecting attention from errors, or "smoothing over" criticism to help others avoid embarrassment or threat
Undiscussables	Making threatening topics undiscussable and making the fact that they are undiscussable also undiscussable
Fancy footwork	Switching defensive strategies without acknowledging doing so, creating a moving target for critics

Sources: Argyris (1982, 1985, 1990, 1993), Argyris et al. (1985), Argyris and Schon (1996).

*Heuristic 6: Combine advocacy with inquiry.*The ladder of inference should not be used only to advocate a position; others should also be encouraged to question our views. A Model II strategy thus combines advocacy with inquiry, stating your position, giving your reasoning, and inviting testing and inquiry (Argyris et al. 1985). For example, statements can be crafted something like "Here is what I am thinking and why. Does that make sense? Do you agree?" or "This is my view. I think it's right, but I might be wrong, so let's take a look at it" (Argyris et al. 1985:331). The validity of claims and assumptions can then be examined collaboratively (Argyris and Schon, 1974, 1996).

When advocacy is combined with inquiry, there is a shift from unilateral attempts to defend one's view and win, to collaborative efforts to explore multiple perspectives and learn. Open testing and "constructive confrontation" of assertions and assumptions is encouraged, while defensiveness and face-saving are minimized (Argyris and Schon 1996:119). When others disagree with us, we can ask them to illustrate their views (e.g., "What did X say or do that led you to infer that?") and encourage them to test our views or propose alternatives. Model II does not seek conformity or consensus. Conflicting perspectives are seen as resources that provide an opportunity to enhance mutual understanding; other people are seen as potential sources of valid information rather than as competitors who threaten one's ability to win or with whom one must save face (Argyris and Schon 1974, 1996).

Practicing and Redesigning Actions

Implementing Model II strategies is very challenging, especially at first, as this requires disrupting automatic Model I responses while employing new skills in real-time situations (Argyris 1982, 1993). Thus, individuals need continued practice in recognizing defensive reasoning, learning from errors, and moving toward productive reasoning. It is important to have reasonable expectations for success and to recognize progress, even if slow, as challenges and errors will likely trigger doubt, anxiety, embarrassment, and confusion (Argyris 1990, 1993). In accord with Model II values, the goal should be to learn and improve, not to be right and win (Argyris et al. 1985).

Heuristic 7: Reframe errors as learning opportunities. In Model I limited-learning systems, errors are avoided, but when they do occur, they trigger defensiveness and may go unrecognized or become undiscussable. Errors can further escalate as individuals blame others without recognizing their own responsibility for their defensive routines. The more potentially embarrassing or threatening the issue, the more threatening it becomes to confront these routines (Argyris et al. 1985). In contrast, with Model II, we strive to surface and take responsibility for errors and inconsistencies, make them discussable, and use them for learning (Argyris and Schon 1996).

Argyris and colleagues (1985:277–78) distinguished between protective and reflective orientations. Those with a protective orientation fear mistakes and seek to protect themselves from the risks of learning. They view errors as crimes, to be avoided but, if "committed," to be covered up if they want to escape "punishment" (Argyris et al. 1985:280). People with this protective orientation become ashamed of past errors and

afraid of new ones. They avoid taking risks or experimenting with new ideas or actions, especially if they lack confidence. When protective-oriented individuals discover errors, they act "as if they believe that they are not only wrong but wrong for being wrong" (Argyris et al. 1985:287). A protective orientation may also be accompanied by a sense of brittleness, in which the individual experiences high feelings of failure or despair when making errors (Argyris et al. 1985:287). This can lead to reinforcing cycles of lower confidence, poorer performance, and greater fear of failure.

In contrast, if we adopt a reflective orientation, we recognize that mistakes are a necessary part of learning and we reframe errors as "puzzles" that invoke curiosity and are to be engaged as learning opportunities. With a reflective orientation, individuals are more likely to reflect on their mistakes and to experiment with alternative actions in order to learn how to be more effective. In taking responsibility for their learning, they are more likely to make their reasoning explicit, ask for clarifications, and acknowledge feelings, uncertainties, and dilemmas as pieces of the puzzle to examine. As when learning a new skill, errors inform the individual about current performance, not about overall competence or worth. Success is not about avoiding mistakes but about learning from them.

Heuristic 8: Engage in reflective experimentation. A reflective orientation facilitates reflective experimentation—reflecting on and testing ideas and actions in ongoing practice and learning from the consequences. This can promote greater competence and confidence in learning-oriented (Model II) action strategies (Argyris et al. 1985:279). We must act as if our theory is true, while being willing to change our theory if evidence argues against it. We should accept personal responsibility for defensive patterns and recognize our skilled incompetence and any incongruence between espoused theories and theories-in-use. Learning will occur as we test our theories and open ourselves to alternative interpretations (Argyris and Schon 1974, 1996).

In reflective experimentation, individuals often face a core dilemma: a conflict between their desires to learn (by surfacing errors, inconsistencies, and dilemmas) and to protect themselves (by keeping these hidden). This makes learning challenging, and individuals need realistic expectations about the difficulty of internalizing Model II. At first, learners should expect "hybrids" that integrate aspects of Model II with Model I. With a reflective orientation, a person is more vulnerable to error but is also more open to learning and to long-term success. Those individuals most ready to learn Model II are able to listen to feedback about their errors with minimal defensiveness and to persist through the challenges of learning. They are able to be "vulnerable without feeling weak" (Argyris and Schon 1996:148).

Extended Example: Reopening Schools in a Pandemic

To further illustrate the application of the above principles and heuristics in everyday interactions, this section provides a more extended example. At the time of this writing, we are in the midst of the COVID-19 pandemic and there is much debate about the reopening of businesses and schools. Assume that you are about to discuss whether

schools should reopen for in-person learning. As you have been following the scientific advice from public health experts, you have some concerns about reopening schools too quickly, but you expect your conversation partner, X, to minimize these health concerns.

In *committing to a learning orientation*, you could approach the conversation focused on what you can learn about school reopening as well as on the concerns of those with different views. Instead of seeking to win the argument or keeping your views private to avoid conflict, you could strive to share your views while encouraging testing and inquiry and to learn about X's views while respecting their free choice. Double-loop learning could involve questioning the assumption that we must choose either student learning or health, and this could open the door to exploring ways to promote both. The conversation could be viewed as an opportunity for you to not only learn about the school-reopening issue but also practice promoting more learning-oriented conversations.

Surfacing learning inhibitors requires reflecting on conversations to identify use of a Model I theory-in-use or of defensive routines that inappropriately inhibit learning. For example, you might recognize that, despite your best intentions, you have begun arguing against school reopening without inquiring into the other person's views (unilateral advocacy), or you may have stated that you have safety concerns without providing concrete examples (high-level inferences), or you may have avoided mentioning X not wearing their mask correctly because it was sensitive (self-censoring). Such reflection may occur as the conversation unfolds, in which case adjustments can be made, but because this reflection in action is difficult, it may also occur after the fact, in which case it can provide a basis for improving the next time. Note that this framework does not imply that learning need always have top priority, but reflection can help us prioritize these values and be more intentional in our conversations.

Suppose X states that we need to reopen schools so the pandemic does not disrupt our lives. You might try *developing productive reasoning* by saying, "This is an important but difficult issue. I think I have a different view on this and would be happy to share my thoughts, but I would also like to understand where you are coming from. Would you be willing to explore this further?" If X responds that people against reopening just don't recognize the problems with online learning, you might clarify that you share concerns about online learning but are also worried about safety issues. Here, you could illustrate this with concrete examples (e.g., concern about community spread of the virus if students do not wear masks and keep a six-foot social distance). Then you could inquire, "Do you agree that these are safety concerns?" Through such testing, you might learn that X does have safety concerns but that because they cannot afford to lose their job, the alternative for them to school reopening is daycare, where such safety concerns are worse. You could combine advocacy with inquiry by stating, "I think there are ways to have some in-person learning while addressing these safety concerns. Do you agree?" This might direct the conversation toward a solution that could promote both effective learning and health or safety concerns.

As Argyris notes, because most of us have learned to rely on Model I defensive reasoning and a protective orientation since childhood, implementing Model II productive reasoning and a reflective orientation will be challenging. This is true even in the best of circumstances, as Argyris found when working with a highly motivated group

guided by his skilled facilitation. Thus, when you attempt to *practice and redesign actions*, you should expect setbacks, which are even more likely when implementing these strategies in everyday interactions, where others may not prioritize learning. If you notice yourself slipping into comfortable habits of advocacy without inquiry or being overprotective, or if you become frustrated or lose confidence in using these strategies in real time, you can reframe these "errors" as further learning opportunities. With reflective experimentation and practice, you can hopefully increase the learning potential of your conversations and possibly provide a model of a more reflective and learning-oriented approach for others.

CONCLUSION

Chris Argyris's theory of action perspective was part of his broader action science project that engaged individuals in transforming practice through collaborative learning and critical inquiry. As a facilitator, Argyris was able to demonstrate improvement toward Model II theories-in-use and learning systems through long-term intervention with executives and consultants (Argyris 1982, 1993; Argyris and Schon 1996). For Argyris, sustained meaningful change is likely only when Model I skilled incompetence and defensive routines are disrupted and there is a shift to Model II double-loop inquiry and productive reasoning (Argyris and Schon 1996).

  The goal of this article has been to demonstrate the value of Argyris's key ideas for promoting lifelong learning and inquiry. In a rapidly changing world, skilled professionals need to learn not only how to apply their techniques but also how to learn. Otherwise "smart" individuals may have difficulty with such learning if they have never learned or have forgotten how to learn from "failure" (Argyris 1991:100). Thus, professionals can benefit from developing a Model II learning-orientation, with capacities for double-loop learning, productive reasoning, and reflective experimentation. A learning orientation is, however, also needed for all productive and responsible citizens, who ideally make decisions based on valid information in consultation with others. Especially in polarized times, we need to develop our collective capacity for learning and inquiry among those with different viewpoints (Greene 2013; Haidt 2012). Learning and inquiry are essential if we as a pluralistic democratic society are to be able to make decisions and set public policy using evidence-based reasoning and to explore "liberating alternatives" for the problems we face (e.g., climate change, poverty, discrimination).

  Three topics that could be given only limited attention in this article define possible directions for future research. First, what possibilities and challenges arise when trying to apply Argyris's ideas in more informal groups and everyday interactions? According to Argyris, it is difficult for individuals to adopt a Model II theory-in-use within Model I learning systems that reinforce defensive routines. Thus, when individuals act outside the confines of a group already committed to working together, with the help of a skilled facilitator, to improve their learning, which strategies are most effective? What are their limitations in these contexts?

  For example, one challenge that individuals may confront in everyday contexts is how to promote learning and openness while following traditional norms of

politeness, which are likely expected by those not informed by or committed to Argyris's views. Consider "easing in" and other face-saving behaviors; Argyris's concern is that these strategies emphasize protecting others, based on the untested assumption that others need protection. Further, because these strategies typically must remain private (telling someone you are easing in or trying to help them save face likely negates the intended effect), this adds layers of undiscussables that inhibit learning. There may be ways to start conversations following these politeness norms, however, and then, if others seem open to further testing and inquiry, one could move toward a more direct learning-oriented strategy. Such hybrid approaches could be tested in ongoing practice through reflective experimentation.

The second important area for further study concerns the implications of cultural differences for implementing Argyris's ideas. Is the prioritization of learning over control and protection inconsistent with the core values of some cultures? Are there ways to adapt his ideas to accommodate these differences while still emphasizing individual and collective learning? One possible framework for exploring such questions is that of Geert Hofstede. Hofstede and colleagues (2010) have identified five dimensions along which cultures vary: individualism-collectivism (prioritizing of individual vs. group interests), power distance (the extent to which power or status differences are accepted), masculinity-femininity (an emphasis on achievement and competition vs. relationships and cooperation), uncertainty avoidance (the extent to which individuals feel threatened by uncertainty or ambiguity), and time orientation (a short-term vs. long-term focus).

Argyris's goal of shifting from Model I to Model II theories of action depends on valuing learning over control and protection from conflict and negative feelings. Some cultures may not accept Argyris's prioritization of learning over these other values, and his framework would thus be less relevant or appropriate. For example, collectivist cultures may place more emphasis on group harmony than on learning, high-power-distance cultures may not accept openness or questioning from those of lower status, and short-term-oriented cultures may focus more on honoring traditions and maintaining existing relationships (through face-saving) than on future-oriented learning goals. In other cases, cultures may seek to prioritize learning but may require accommodations to also keep other values in acceptable ranges. For example, those from cultures high on what Hofstede calls masculinity may be less willing to be openly vulnerable and cooperate than they are to maintain control and to compete to win. Finally, those with high uncertainty avoidance may be especially uncomfortable with the risk and unpredictability associated with openly expressing ideas and encouraging public testing and inquiry. These are just some tentative connections that could be explored in further research.

Finally, the purpose of this article has been to present Argyris's ideas as a useful framework for understanding and promoting lifelong learning and inquiry; however, this is not a comparative claim that his is better than or should replace other learning theories. Thus, a final direction for future research is to explore relations between Argyris's and other approaches. In what ways does the theory of action perspective complement other perspectives? Where do conflicts or inconsistencies arise? In this article, I have argued that Argyris provides one valuable perspective. Ideally, however,

it should be combined with other perspectives for a deeper understanding of lifelong learning and inquiry, one that will be needed to realize Argyris's vision of a more learning-oriented democratic society.

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