Educational leaders' problem-solving for educational improvement: Belief validity testing in conversations

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Abstract

Educational leaders' effectiveness in solving problems is vital to school and system-level efforts to address macrosystem problems of educational inequity and social injustice. Leaders' problem-solving conversation attempts are typically influenced by three types of beliefs—beliefs about the nature of the problem, about what causes it, and about how to solve it. Effective problem solving demands testing the validity of these beliefs—the focus of our investigation. We analyzed 43 conversations between leaders and staff about equity related problems including teaching effectiveness. We first determined the types of beliefs held and the validity testing behaviors employed drawing on fine-grained coding frameworks. The quantification of these allowed us to use cross tabs and chi-square tests of independence to explore the relationship between leaders' use of validity testing behaviors (those identified as more routine or more robust, and those relating to both advocacy and inquiry) and belief type. Leaders tended to avoid discussion of problem causes, advocate more than inquire, bypass disagreements, and rarely explore logic between solutions and problem causes. There was a significant relationship between belief type and the likelihood that leaders will test the validity of those beliefs—beliefs about problem causes were the least likely to be tested. The patterns found here are likely to impact whether micro and mesosystem problems, and ultimately exo and macrosystem problems, are solved. Capability building in belief validity testing is vital for leadership professional learning to ensure curriculum, social justice and equity policy aspirations are realized in practice.

Keywords Educational Change · Educational improvement · Problem solving · Problem-solving conversations · Educational leadership · Validity testing

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This study examines the extent to which leaders, in their conversations with others, test rather than assume the validity of their own and others' beliefs about the nature, causes of, and solutions to problems of teaching and learning that arise in their sphere of responsibility. We define a problem as a gap between the current and desired state, plus the demand that the gap be reduced (Robinson, 1993). We position this focus within the broader context of educational change, and educational improvement in particular, since effective discussion of such problems is central to improvement and vital for addressing issues of educational equity and social justice.

Educational improvement and leaders' role in problem solving

Educational leaders work in a discretionary problem-solving space. Ball (2018) describes discretionary spaces as the micro level practices of the teacher. It is imperative to attend to what happens in these spaces because the specific talk and actions that occur in particular moments (for example, what the teacher says or does when one student responds in a particular way to his or her question) impact all participants in the classroom and shape macro level educational issues including legacies of racism, oppression, and marginalization of particular groups of students. A parallel exists, we argue, for leaders' problem solving—how capable leaders are at dealing with micro-level problems in the conversational moment impacts whether a school or network achieves its improvement goals. For example, how a leader deals with problems with a particular teacher or with a particular student or group of students is subtly but strongly related to the solving of equity problems at the exo and macro levels. Problem solving effectiveness is also related to challenges in the realization of curriculum reform aspirations, including curriculum reform depth, spread, reach, and pace (Sinnema & Stoll, 2020b).

The conversations leaders have with others in their schools in their efforts to solve educational problems are situated in a broader environment which they both influence and are influenced by. We draw here on Bronfenbrenner's (1992) ecological systems theory to construct a nested model of educational problem solving (see Fig. 1). Bronfenbrenner focused on the environment around children, and set out five interrelated systems that he professed influence a child's development. We propose that these systems can also be used to understand another type of learner—educators, including leaders and teachers—in the context of educational problem solving.

Bronfenbrenner's (1977) microsystem sets out the immediate environment, parents, siblings, teachers, and peers as influencers of and influenced by children. We propose the micro system for educators to include those they have direct contact with including their students, other teachers in their classroom and school, the school board, and the parent community. Bronfenbrenner's meso system referred to the interactions between a child's microsystems. In the same way, when foregrounding the ecological system around educators, we suggest attention to the problems that occur in the interactions between students, teachers, school leaders, their boards, and communities. In the exo system, Bronfenbrenner directs attention to other social structures (formal and informal), which do not themselves contain the child, but indirectly influence them as they affect one of the microsystems. In

Fig. 1 Nested model of educational problem solving

the same way, we suggest educational ministries, departments and agencies function to influence educators. The macro system as theorized by Bronfenbrenner focuses on how child development is influenced by cultural elements established in society, including prevalent beliefs, attitudes, and perceptions. In our model, we recognise how such cultural elements of Bronfenbrenner's macro system also relate to educators in that dominant and pervasive beliefs, attitudes and perceptions create and perpetuate educational problems, including those relating to educational inequity, bias, racism, social injustice, and underachievement. The chronosystem, as Bronfenbrenner describes, shows the role of environmental changes across a lifetime, which influences development. In a similar way, educators' professional transitions and professional milestones influence and are influenced by other system levels, and in the context of our work, their problem solving approaches.

Leaders' effectiveness in discussions about problems related to the micro and mesosystem contributes greatly to the success of exosystem reform efforts, and those efforts, in turn, influence the beliefs, attitudes, and ideologies of the macrosystem. As Fig. 1 shows, improvement goals (indicated by the arrows moving from the current to a desired state) in the exo or macrosystem are unlikely to be achieved without associated improvement in the micro and mesosystem involving students, teachers, and groups of teachers, schools and their boards and parent communities. Similarly, the level of improvement in the macro and exosystems is limited by the extent to which more improvement goals at the micro and mesosystem are achieved through solving problems relating to students' experience and school and classroom practices including curriculum, teaching, and assessment. As well as drawing on Bronfenbrenner's ecological systems theory, our nested model of problem solving draws on problem solving theory to draw attention to how gaps between current and desired states at each of the system levels also influence each other (Newell & Simon, 1972). Efforts to solve problems in any one system (to move from current state toward a more desired state) are supported by similar moves at other interrelated systems. For example, the success of a teacher seeking to solve a curriculum problem (demand from parents to focus on core knowledge in traditional learning domains, for example)—a problem related to the microsystem and mesosystem—will be influenced by how similar problems are recognised, attended to, and solved by those in the ministries, departments and agencies in the exosystem.

In considering the role of educational leaders in this nested model of problem solving, we take a capability perspective (Mumford et al., 2000) rather than a leadership style perspective (Bedell-Avers et al., 2008). School leaders (including those with formal *and* informal leadership positions) require particular capabilities if they are to enact ambitious policies and solve complex problems related to enhancing equity for marginalized and disadvantaged groups of students (Mavrogordato & White, 2020). Too often, micro and mesosystem problems remain unsolved which is problematic not only for those directly involved, but also for the resolution of the related exo and macrosystem problems. The ill-structured nature of the problems school leaders face, and the social nature of the problem-solving process, contribute to the ineffectiveness of leaders' problem-solving efforts and the persistence of important microsystem and mesosystem problems in schools.

Ill-structured problems

The problems that leaders need to solve are typically ill-structured rather than clearly defined, complex rather than straight-forward, and adaptive rather than routine challenges (Bedell-Avers et al., 2008; Heifetz et al., 2009; Leithwood & Stager, 1989; Leithwood & Steinbach, 1992, 1995; Mumford & Connelly, 1991; Mumford et al., 2000; Zaccaro et al., 2000). As Mumford and Connelly explain, “even if their problems are not totally unprecedented, leaders are, [...] likely to be grappling with unique problems for which there is no clear-cut predefined solution” (Mumford & Connelly, 1991, p. 294). Most such problems are difficult to solve because they can be construed in various ways and lack clear criteria for what counts as a good solution. Mumford et al. (2000) highlight the particular difficulties in solving ill-structured problems with regard to accessing, evaluating and using relevant information:

Not only is it difficult in many organizational settings for leaders to say exactly what the problem is, it may not be clear exactly what information should be brought to bear on the problem. There is a plethora of available information in complex organizational systems, only some of which is relevant to the problem. Further, it may be difficult to obtain accurate, timely information and identify key diagnostic information. As a result, leaders must actively seek and carefully evaluate information bearing on potential problems and goal attainment. (p. 14)

Problems in schools are complex. Each single problem can comprise multiple educational dimensions (learners, learning, curriculum, teaching, assessment) as well as relational, organizational, psychological, social, cultural, and political dimensions. In response to a teaching problem, for example, a single right or wrong answer is almost never at play; there are typically countless possible ‘responses’ to the problem of how to teach effectively in any given situation.

Problem solving as socially situated

Educational leaders’ problem solving is typically *social* because multiple people are usually involved in defining, explaining, and solving any given problem (Mumford et al., 2000). When there are multiple parties invested in addressing a problem, they typically hold diverse perspectives on how to describe (frame, perceive, and communicate about problems), explain (identify causes which lead to the problem), and solve the problem. Argyris and Schön (1974) argue that effective leaders must manage the complexity of integrating multiple and diverse perspectives, not only because all parties need to be internally committed to solutions, but also because quality solutions rely on a wide range of perspectives and evidence. Somewhat paradoxically, while the multiple perspectives involved in social problem solving add to their inherent complexity, these perspectives are a resource for educational change, and for the development of more effective solutions (Argyris & Schön, 1974). The social nature of problem solving requires high trust so participants can provide

relevant, accurate, and timely information (rather than distort or withhold it), recognize their interdependence, and avoid controlling others. In high trust relationships, as Zand's early work in this field established, "there is less socially generated uncertainty and problems are solved more effectively" (Zand, 1972, p. 238).

Leaders' capabilities in problem solving

Leadership research has established the centrality of capability in problem solving to leadership effectiveness generally (Marcy & Mumford, 2010; Mumford et al., 2000, 2007) and to educational leadership in particular. Leithwood and Stager (1989), for example, consider "administrator's problem-solving processes as crucial to an understanding of why principals act as they do and why some principals are more effective than others" (p. 127). Similarly, Robinson (1995, 2001, 2010) positions the ability to solve complex problems as central to all other dimensions of effective educational leadership. Unsurprisingly, problem solving is often prominent in standards for school leaders/leadership and is included in tools for the assessment of school leadership (Goldring et al., 2009). Furthermore, its importance is heightened given the increasing demand and complexity in standards for teaching (Sinnema, Meyer & Aitken, 2016) and the trend toward leadership across networks of schools (Sinnema, Daly, Liou, & Rodway, 2020a) and the added complexity of such problem solving where a system perspective is necessary.

Empirical research on leaders' practice has revealed that there is a need for capability building in problem solving (Le Fevre et al., 2015; Robinson et al., 2020; Sinnema et al., 2013; Sinnema et al., 2016; Smith, 1997; Spillane et al., 2009; Timperley & Robinson, 1998; Zaccaro et al., 2000). Some studies have compared the capability of leaders with varying experience. For example, Leithwood and Stager (1989) noted differences in problem solving approaches between novice and expert principals when responding to problem scenarios, particularly when the scenarios described ill-structured problems. Principals classified as 'experts' were more likely to collect information rather than make assumptions, and perceived unstructured problems to be manageable, whereas typical principals found these problems stressful. Expert principals also consulted extensively to get relevant information and find ways to deal with constraints. In contrast, novice principals consulted less frequently and tended to see constraints as obstacles (Leithwood & Stager, 1989). Allison and Allison (1993) reported that while experienced principals were better than novices at developing abstract problem-solving goals, they were less interested in the detail of how they would pursue these goals. Similar differences were found in Spillane et al.'s (2009) work that found expert principals to be better at interpreting problems and reflecting on their own actions compared with aspiring principals. More recent work (Sinnema et al., 2021) highlights that educators' perceptions of discussion quality is positively associated with both new learning for the educator (learning that influences their practice) and improved practice (practices that reach students)—the more robust and helpful educators report their professional discussion to be, the more likely they are to report improvement in their practice. This supports the demand for quality conversation in educational teams.

Fig. 2 Model of effective problem-solving conversations

Solving problems related to teaching and learning that occur in the micro or mesosystem usually requires conversations that demand high levels of interpersonal skill. Skill development is important because leaders tend to have difficulty inquiring deeply into the viewpoints of others (Le Fevre & Robinson, 2015; Le Fevre et al., 2015; Robinson & Le Fevre, 2011). In a close analysis of 43 conversation transcripts, Le Fevre et al. (2015) showed that when leaders anticipated or encountered diverse views, they tended to ask leading or loaded rather than genuine questions. This pattern was explained by their judgmental thinking, and their desire to avoid negative emotion and stay in control of the conversation. In a related study of leaders' conversations, a considerable difference was found between the way educational leaders described their problem before and during the conversation with those involved (Sinnema et al., 2013). Prior to the conversation, privately, they tended to describe their problem as more serious and more urgent than they did in the conversation they held later with the person concerned.

One of the reasons for the mismatch between their private descriptions and public disclosures was the judgmental framing of their beliefs about the other party's intentions, attitudes, and/or motivations (Peeters & Robinson, 2015). If leaders are not willing or able to reframe such privately-held beliefs in a more respectful manner, they will avoid addressing problems through fear of provoking negative emotion, and neither party will be able to critique the reasoning that leads to the belief in

question (Robinson et al., 2020). When that happens, beliefs based on faulty reasoning may prevail, problem solutions may be based only on that which is discussable, and the problem may persist.

A model of effective problem-solving conversations

We present below a normative model of effective problem-solving conversations (Fig. 2) in which testing the validity of relevant beliefs plays a central role. Leaders test their beliefs about a problem when they draw on a set of validity testing behaviors and enact those behaviors, through their inquiry and advocacy, in ways that are consistent with the three interpersonal values included in the model. The model proposes that these processes increase the effectiveness of social problem solving, with effectiveness understood as progressing the task of solving the problem while maintaining or improving the leader's relationship with those involved. In formulating this model, we drew on the previously discussed research on problem solving and theories of interpersonal and organisational effectiveness.

The role of beliefs in problem solving

Beliefs are important in the context of problem solving because they shape decisions about what constitutes a problem and how it can be explained and resolved. Beliefs link the object of the belief (e.g., a teacher's planning) to some attribute (e.g., copied from the internet). In the context of school problems these attributes are usually tightly linked to a negative evaluation of the object of the belief (Fishbein & Ajzen, 1975). Problem solving, therefore, requires explicit attention by leaders to the validity of the information on which their own and others' beliefs are based. The model draws on the work of Mumford et al. (2000) by highlighting three types of beliefs that are central to how people solve problems—beliefs about whether and why a situation is problematic (we refer to these as problem description beliefs); beliefs about the precursors of the problem situation (we refer to these as problem explanation beliefs); and beliefs about strategies which could, would, or should improve the situation (we refer to these as problem solution beliefs). With regard to problem explanation beliefs, it is important that attention is not limited to surface level factors, but also encompasses consideration of deeper related issues in the broader social context and how they contribute to any given problem.

The role of values in problem-solving conversations

Figure 2 proposes that problem solving effectiveness is increased when leaders' validity testing behaviors are consistent with three values—respecting the views of others, seeking to maximize validity of their own and others' beliefs, and building

internal commitment to decisions reached. The inclusion of these three values in the model means that our validity testing behaviors must be conceptualized and measured in ways that capture their interpersonal (respect and internal commitment) and epistemic (valid information) underpinnings. Without this conceptual underpinning, it is likely to be difficult to identify the validity testing behaviors that are associated with effectiveness. For example, the act of seeking agreement can be done in a coercive or a respectful manner, so it is important to define and measure this behavior in ways that distinguish between the two. How this and similar distinctions were accomplished is described in the subsequent section on the five validity testing behaviors.

The three values in Fig. 2 are based on the theories and practice of interpersonal and organizational effectiveness developed by Argyris and Schön (1974, 1978, 1996) and applied more recently in a range of educational leadership research contexts (Hannah et al., 2018; Patuawa et al., 2021; Sinnema et al., 2021a). We have drawn on the work of Argyris and Schön because their theories explain the dilemma many leaders experience between the two components of problem solving effectiveness and indicate how that dilemma can be avoided or resolved.

Seeking to maximize the validity of information is important because leaders' beliefs have powerful consequences for the lives and learning of teachers and students and can limit or support educational change efforts. Leaders who behave consistently with the validity of information value are truth seekers rather than truth claimers in that they are open-minded and thus more attentive to the information that disconfirms rather than confirms their beliefs. Rather than assuming the validity of their beliefs and trying to impose them on others, their stance is one of seeking to detect and correct errors in their own and others' thinking (Robinson, 2017).

The value of respect is closely linked to the value of maximizing the validity of information. Leaders increase validity by listening carefully to the views of others, especially if those views differ from their own. Listening carefully requires the accordance of worth and respect, rather than private or public dismissal of views that diverge from or challenge one's own. If leaders' conversations are guided by the two values of valid information and respect, then the third value of fostering internal commitment is also likely to be present. Teachers become internally committed to courses of action when their concerns have been listened to and directly addressed as part of the problem-solving process.

The role of validity testing behaviors in problem solving

Figure 2 includes five behaviors designed to test the validity of the three types of belief involved in problem solving. They are: 1) disclosing beliefs; 2) providing grounds; 3) exploring difference; 4) examining logic; and 5) seeking agreement. These behaviors enable leaders to check the validity of their beliefs by engaging in open minded disclosure and discussion of their thinking. While these behaviors are most closely linked to the value of maximizing valid information, the values of respect and internal commitment are also involved in these behaviors.

For example, it is respectful to honestly and clearly disclose one's beliefs about a problem to the other person concerned (advocacy), and to do so in ways that make the grounds for the belief testable and open to revision. It is also respectful to combine advocacy of one's own beliefs with inquiry into others' reactions to those beliefs and with inquiry into their own beliefs. When leaders encounter doubts and disagreements, they build internal rather than external commitment by being open minded and genuinely interested in understanding the grounds for them (Spiegel, 2012). By listening to and responding directly to others' concerns, they build internal commitment to the process and outcomes of the problem solving.

Advocacy and inquiry dimensions

Each of the five validity testing behaviors can take the form of a statement (advocacy) or a question (inquiry). A leader's advocacy contributes to problem solving effectiveness when it communicates his or her beliefs and the grounds for them, in a manner that is consistent with the three values. Such disclosure enables others to understand and critically evaluate the leader's thinking (Tompkins, 2013). Respectful inquiry is equally important, as it invites the other person into the conversation, builds the trust they need for frank disclosure of their views, and signals that diverse views are welcomed. Explicit inquiry for others' views is particularly important when there is a power imbalance between the parties, and when silence suggests that some are reluctant to disclose their views. Across their careers, leaders tend to rely more heavily on advocating their own views than on genuinely inquiring into the views of others (Robinson & Le Fevre, 2011). It is the combination of advocacy and inquiry behaviors, that enables all parties to collaborate in formulating a more valid understanding of the nature of the problem and of how it may be solved.

The five validity testing behaviors

Disclosing beliefs is the first and most essential validity testing behavior because beliefs cannot be publicly tested, using the subsequent four behaviors, if they are not disclosed. This behavior includes leaders' advocacy of their own beliefs and their inquiry into others' beliefs, including reactions to their own beliefs (Peeters & Robinson, 2015; Robinson & Le Fevre, 2011).

Honest and respectful disclosure ensures that all the information that is believed to be relevant to the problem, including that which might trigger an emotional reaction, is shared and available for validity testing (Robinson & Le Fevre, 2011; Robinson et al., 2020; Tjosvold et al., 2005). Respectful disclosure has been linked with follower trust. The empirical work of Norman et al. (2010), for example, showed that leaders who disclose more, and are more transparent in their communication, instill higher levels of trust in those they work with.

Providing grounds, the second validity testing behavior, is concerned with leaders expressing their beliefs in a way that makes the reasoning that led to them testable

(advocacy) and invites others to do the same (inquiry). When leaders clearly explain the grounds for their beliefs and invite the other party to critique their relevance or accuracy, the validity or otherwise of the belief becomes more apparent. Both advocacy and inquiry about the grounds for beliefs can lead to a strengthening, revision, or abandonment of the beliefs for either or both parties (Myran & Sutherland, 2016; Robinson & Le Fevre, 2011; Robinson et al., 2020).

Exploring difference is the third validity testing behavior. It is essential because two parties simply disclosing beliefs and the grounds for them is insufficient for arriving at a joint solution, particularly when such disclosure reveals that there are differences in beliefs about the accuracy and implications of the evidence or differences about the soundness of arguments. Exploring difference through advocacy is seen in such behaviors as identifying and signaling differing beliefs and evaluating contrary evidence that underpins those differing beliefs. An inquiry approach to exploring difference (Timperley & Parr, 2005) occurs when a leader inquires into the other party's beliefs about difference, or their response to the leaders' beliefs about difference.

Exploring differences in beliefs is key to increasing validity in problem solving efforts (Mumford et al., 2007; Robinson & Le Fevre, 2011; Tjosvold et al., 2005) because it can lead to more integrative solutions and enhance the commitment from both parties to work with each other in the future (Tjosvold et al., 2005). Leaders who are able to engage with diverse beliefs are more likely to detect and challenge any faulty reasoning and consequently improve solution development (Le Fevre & Robinson, 2015). In contrast, when leaders do not engage with different beliefs, either by not recognizing or by intentionally ignoring them, validity testing is more limited. Such disengagement may be the result of negative attributions about the other person, such as that they are resistant, stubborn, or lazy. Such attributions reduce opportunities for the rigorous public testing that is afforded by the exchange and critical examination of competing views.

Examining logic, the fourth validity testing behavior, highlights the importance of devising a solution that adequately addresses the nature of the problem at hand and its causes. To develop an effective solution both parties must be able to evaluate the logic that links problems to their assumed causes and solutions. This behavior is present when the leader suggests or critiques the relationship between possible causes of and solutions to the identified problem. In its inquiry form, the leader seeks such information from the other party. As Zaccaro et al. (2000) explain, good problem solvers have skills and expertise in selecting the information to attend to in their effort to "understand the parameters of problems and therefore the dimensions and characteristics of a likely solution" (p. 44–45). These characteristics may include solution timeframes, resource capacities, an emphasis on organizational versus personal goals, and navigation of the degree of risk allowed by the problem approach. Explicitly exploring beliefs is key to ensuring the logic linking problem causes and any proposed solution. Taking account of a potentially complex set of contributing factors when crafting logical solutions, and testing the validity of beliefs about them, is likely to support effective problem solving. This requires what Copland (2010) describes as a creative process with similarities to clinical reasoning in medicine,

in which “the initial framing of the problem is fundamental to the development of a useful solution” (p. 587).

Seeking agreement, the fifth validity testing behavior, signals the importance of warranted agreement about problem beliefs. We use the term ‘warranted’ to make clear that the goal is not merely getting the other party to agree (either that something is a problem, that a particular cause is involved, or that particular actions should be carried out to solve it)—mere agreement is insufficient. Rather, the goal is for *warranted* agreement whereby both parties have explored and critiqued the beliefs (and their grounds) of the other party in ways that provide a strong basis for the agreement. Both parties must come to some form of agreement on beliefs because successful solution implementation occurs in a social context, in that it relies on the commitment of all parties to carry it out (Mumford et al., 2000; Robinson & Le Fevre, 2011; Tjosvold et al., 2005). Where full agreement does not occur, the parties must at least be clear about where agreement/disagreement lies and why.

Testing the validity of beliefs using these five behaviors, and underpinned by the values described earlier is, we argue, necessary if conversations are to lead to two types of improvement—progress on the task (i.e., solving the problem) and improving the relationship between those involved in the conversation (i.e., ensuring those relationship between the problem-solvers is intact and enhanced through the process). We draw attention here to those improvement purposes as distinct from those underpinning work in the educational leadership field that takes a neo-managerialist perspective. The rise of neo-managerialism is argued to redefine school management and leadership along managerial lines and hence contribute to schools that are inequitable, reductionist, and inauthentic (Thrupp & Willmott, 2003). School leaders, when impacted by neo-managerialism, need to be (and are seen as) “self-interested, opportunistic innovators and risk-takers who exploit information and situations to produce radical change.” In contrast, the model we propose rejects self-interest. Our model emphasizes on deep respect for the views of others and the relentless pursuit of genuine shared commitment to understanding and solving problems that impact on children and young people through collaborative engagement in joint problem solving. Rather than permitting leaders to exploit others, our model requires leaders to be adept at using both inquiry and advocacy together with listening to both progress the task (solving problems) and simultaneously enhance the relationship between those involved. We position this model of social problem solving effectiveness as a tool for addressing social justice concerns—it intentionally dismisses problem solving approaches that privilege organizational efficiency indicators and ignore the wellbeing of learners and issues of inequity, racism, bias, and social injustice within and beyond educational contexts.

Methodology

The following section outlines the purpose of the study, the participants, and the mixed methods approach to data collection and analysis.

Research purpose

Our prior qualitative research (Robinson et al., 2020) involving in-depth case studies of three educational leaders revealed problematic patterns in leaders' approach to problem-solving conversations: little disclosure of causal beliefs, little public testing of beliefs that might trigger negative emotions, and agreement on solutions that were misaligned with causal beliefs. The present investigation sought to understand if a quantitative methodological approach would reveal similar patterns and examine the relationship between belief types and leaders' use of validity testing behaviors. Thus, our overarching research question was: to what extent do leaders test the validity of their beliefs in conversations with those directly involved in the analysis and resolution of the problem? Our argument is that while new experiences might motivate change in beliefs (Bonner et al., 2020), new insights gained through testing the validity of beliefs is also imperative to change. The sub-questions were:

1. What is the relative frequency in the types of beliefs leaders hold about problems involving others?
2. To what extent do leaders employ validity testing behaviors in conversations about those problems?
3. Are there differential patterns in leaders' validity testing of the different belief types?

Participants

The participants were 43 students in a graduate course on educational leadership in New Zealand who identified an important on the job problem that they intended to discuss with the person directly involved.

The mixed methods approach

The study took a mixed methods approach using a partially mixed sequential equal status design; (QUAL → QUAN) (Leech & Onwuegbuzie, 2009). The five stages of sourcing and analyzing data and making interpretations are summarised in Fig. 3 below and outlined in more detail in the following sections (with reference in brackets to the numbered phases in the figure). We describe the study as partially mixed because, as Leech & Onwuegbuzie, 2009 explain, in partially mixed methods “both the quantitative and qualitative elements are conducted either concurrently or sequentially in their entirety before being mixed at the data interpretation stage” (p. 267).

Fig. 3 Overview of mixed methods approach

Stage 1: Qualitative data collection

Three data sources were used to reveal participants' beliefs about the problem they were seeking to address. The first source was their response to nine open ended items in a questionnaire focused on a real problem the participant had attempted to address but that still required attention (1a). The items were about: the nature and history of the problem; its importance; their own and others' contribution to it; the causes of the problem; and the approach to and effectiveness of prior attempts to resolve it.

The second source (1b) was the transcript of a real conversation (typically between 5 and 10 minutes duration) the leaders held with the other person involved in the problem, and the third was the leaders' own annotations of their unspoken thoughts and feelings during the course of the conversation (1c). The transcription was placed in the right-hand column (RHC) of a split page with the annotations recorded at the appropriate place in the left-hand column (LHC). The LHC method was originally developed by Argyris and Schön (1974) as a way of examining discrepancies between people's espoused and enacted interpersonal values. Referring to data about each leader's behavior (as recorded in the transcript of the conversation) and their thoughts (as indicated in the LHC) was important since the model specifies validity testing behaviors that are motivated by the values of respect, valid information, and internal commitment. Since motives cannot be revealed by speech alone, we also needed access to the thoughts that drove their behavior, hence our use of the LHC data collection technique. This approach allowed us to respond to Leithwood and Stager's (1989) criticism that much research on effective problem solving gives results that "reveal little or nothing about how actions were selected or created and treat the administrator's mind as a 'black box'" (p. 127).

Stage 2: Qualitative analysis

The three stages of qualitative analysis focused on identifying discrete beliefs in the three qualitative data sources, distilling those discrete beliefs into key beliefs, and identifying leaders' use of validity testing behaviors.

Stage 2a: Analyzing types of beliefs about problems

For this stage, we developed and applied coding rules (see Table 1) for the identification of the three types of beliefs in the three sources described earlier—leaders' questionnaire responses, conversation transcript (RHC), and unexpressed thoughts (LHC). We identified 903 discrete beliefs (utterances or thoughts) from the 43 transcripts, annotations, and questionnaires and recorded these on a spreadsheet (2a). While our model proposes that leaders' inquiry will surface and test the beliefs of others, we quantify in this study only the leaders' beliefs.

Table 1 Belief type coding rules

Belief type	Rule focus	Inclusion rule	Inclusion example
Problem description beliefs (PDB)	Problem	Beliefs about whether and why a situation is problematic. The category includes elaborations of the problem and reasons for the situation being considered problematic	I am concerned that the students are not being academically catered for
	- Descriptions (whether/why a problem) - Elaborations - Reasons		
Problem explanation beliefs (PEB)	Problem explanation:	Beliefs about the precursors of the problem situation. The term explanation is used because it embraces both cause in the strict cause-effect temporal sense and intentionality as cause	Temporal: The teacher is not providing explicit modelling of the instructions and does not have a robust system of tracking student progress. Maybe the topics are not related to students' interests
	- precursors - cause-effect - attributions – own/others' motives dispositions intentions	- Causes in a temporal sense are processes or events that occur before the problematic situation and that are perceived to have contributed to it - Causes that are 'attributional' – attributions about own or other's motives, disposition, character, or intentions that caused the problem	Attributional (other): I'm not sure the teacher really cares about the students' culture enough
Problem solution belief (PSB)	Beliefs about solutions - strategies - future - suggestions	Beliefs about strategies which could, would or should improve the situation. Solution beliefs are future oriented. They include suggestions for next steps including inquiry into the effectiveness/ appropriateness of suggested strategies	The teacher needs to improve her teaching practices to be more responsive to student needs

Table 2 Example of multiple beliefs distilled into a single key belief

Discrete beliefs (Quotes from the raw data)	Key belief (distilled from discrete beliefs)
I have a concern about how the curriculum team work together	Team relation- ships are dysfunc- tional
There appears to be some dysfunction which is evident in the meetings as well as outside of the meetings	
Members spend a lot of time criticising each other behind each other's backs	

Stage 2b: Distilling discrete beliefs into key beliefs

Next, we distilled the 903 discrete beliefs into key beliefs (KBs) (2b). This was a complex process and involved multiple iterations across the research team to determine, check, and test the coding rules. The final set of rules for distilling key beliefs were:

1. Beliefs should be made more succinct in the key belief statement, and key words should be retained as much as possible
2. Judgment quality (i.e., negative or positive) of the belief needs to be retained in the key belief
3. Key beliefs should use overarching terms where possible
4. The meaning and the object of the belief need to stay constant in the key belief
5. When reducing overlap, the key idea of both beliefs need to be captured in the key beliefs
6. Distinctive beliefs need to be summarized on their own and not combined with other beliefs
7. The subject of the belief must be retained in the key belief—own belief versus restated belief of other
8. All belief statements must be accounted for in key beliefs

These rules were applied to the process of distilling multiple related beliefs into statements of key beliefs as illustrated by the example in the table below (Table 2).

Further examples of how the rules were applied are outlined in 'Appendix A'. The number of discrete beliefs for each leader ranged from 7 to 35, with an average of 21, and the number of key beliefs for each leader ranged between 4 and 14, with an average of eight key beliefs. Frequency counts were used to identify any patterns in the types of key beliefs which were held privately (not revealed in the conversation but signalled in the left hand column or questionnaire) or conveyed publicly (in conversation with the other party).

Stage 2c: Analyzing leaders' use of validity testing behaviors

We then developed and applied coding rules for the five validity testing behaviors (VTB) outlined in our model (disclosing beliefs, providing grounds, exploring difference, examining logic, and seeking agreement). Separate rules were established for the inquiry and advocacy aspects of each VTB, generating ten coding rules in all (Table 3). These rules, summarised in the table below, and outlined more fully in 'Appendix A', encompassed inclusion and exclusion criteria for the advocacy and inquiry dimensions of each validity testing behavior. For example, the inclusion rule for the VTB of 'Disclosing Beliefs' required leaders to disclose their beliefs about the nature, and/or causes, and/or possible solutions to the problem, in ways that were consistent with the three values included in the model. The associated exclusion rule signalled that this criterion was not met if, for example, the leader asked a question in order to steer the other person toward their own views without having ever disclosed their own views, or if they distorted the urgency or seriousness of the problem related to what they had expressed privately. The exclusion rules also noted how thoughts expressed in the left hand column would exclude the verbal utterance from being treated as disclosure—for example if there were contradictions between the right hand (spoken) and left hand column (thoughts), or if the thoughts indicated that the disclosure had been distorted in order to minimise negative emotion.

The coding rules reflected the values of respect and internal commitment in addition to the valid information value that was foregrounded in the analysis. The emphasis on inquiry, for example (into others' beliefs and/or responses to the beliefs already expressed by the leader), recognised that internal commitment would be impossible if the other party held contrary views that had not been disclosed and discussed. Similarly, the focus on leaders advocating their beliefs, grounds for those beliefs and views about the logic linking solutions to problem causes recognise that it is respectful to make those transparent to another party rather than impose a solution in the absence of such disclosure.

The coding rules were applied to all 43 transcripts and the qualitative analysis was carried out using NVivo 10. A random sample of 10% of the utterances coded to a VTB category was checked independently by two members of the research team following the initial analysis by a third member. Any discrepancies in the coding were resolved, and data were recoded if needed. Descriptive analyses then enabled us to compare the frequency of leaders' use of the five validity testing behaviors.

Stage 3: Data transformation: From qualitative to quantitative data

We carried out transformation of our data set (Burke et al., 2004), from qualitative to quantitative, to allow us to carry out statistical analysis to answer our research questions. The databases that resulted from our data transformation, with text from the qualitative coding along with numeric codes, are detailed next. In database 1, key beliefs were all entered as cases with indications in adjacent columns as to the belief type category they related to, and the source/s of the belief (questionnaire, transcript or unspoken thoughts/feelings). A unique identifier was created for each key belief.

Table 3 Summary of the validity testing behavior coding rules

Validity testing Behavior		Inquire
1 Disclosing beliefs	Advocate Leader discloses belief/s about problem nature and/or cause/s and/or solution/s in ways that give access to their thinking	Inquire Leader invites other to disclose his or her beliefs OR invites other's response to leader's beliefs about problem
2 Providing grounds	Advocate Leader provides grounds for own previously or concurrently stated key belief(s) about problem <i>Grounds include:</i> explanations about how belief/s were reached, OR educational reasons for belief/s, OR examples to demonstrate reasoning for belief/s, OR other relevant information (such as direct observation)	Inquire Leader invites other to provide grounds for the leader's previously stated key belief(s) about problem OR other's response to grounds for leader's previously stated key beliefs
3 Exploring difference	Advocate Leader engages with difference and disagreement by identifying the key beliefs of both parties, describing them OR evaluating the contrary evidence that underpins the differing key beliefs	Inquire Leader inquires into other's key beliefs about difference OR other's response to leader's key beliefs about difference
4 Examining logic	Advocate Leader states own view of the logic linking solutions to the nature and the cause/s of the problem	Inquire Leader inquires into other's logic OR other's response to the leader's logic, linking solutions to the nature and cause/s of the problem
5 Seeking agreement	Advocate Leader signals warranted agreement (i.e. explored grounds) about previously or concurrently stated key beliefs	Inquire Leader inquires into other's view or other's response to leader's view of agreement as warranted in regard to any previously stated key beliefs

In database 2, each utterance identified as meeting the VTB coding rules were entered in column 1. The broader context of the utterance from the original transcript was then examined to establish the type of belief (description, explanation, or solution) the VTB was being applied to, with this recorded numerically alongside the VTB utterance itself. For example, the following utterance had been coded to indicate that it met the ‘providing grounds’ coding rule, and in this phase it was also coded to indicate that it was in relation to a ‘problem description’ belief type:

“I noticed on the feedback form that a number of students, if I’ve got the numbers right here, um, seven out of ten students in your class said that you don’t normally start the lesson with a ‘Do Now’ or a starter activity.” (case 21)

A third database listed all of the unique identifiers for each leader’s key beliefs (KB) in the first column. Subsequent columns were set up for each of the 10 validity testing codes (the five validity testing behaviors for both inquiry and advocacy). The NVivo coding for the VTBs was then examined, one piece of coding at a time, to identify which key belief the utterance was associated with. Each cell that intersected the appropriate key belief and VTB was increased by one as a VTB utterance was associated with a key belief. Our database included variables for both the frequency of each VTB (the number of instances the behavior was used) and a parallel version with just a dichotomous variable indicating the presence or absence of each VTB. The dichotomous variable was used for our subsequent analysis because multiple utterances indicating a certain validity testing behavior were not deemed to necessarily constitute better quality belief validity testing than one utterance.

Stage 4: Quantitative analysis

The first phase of quantitative analysis involved the calculation of frequency counts for the three belief types (4a). Next, frequencies were calculated for the five validity testing behaviors, and for those behaviors in relation to each belief type (4b).

The final and most complex stage of the quantitative analysis, stages 4c through 4f, involved looking for patterns across the two sets of data created through the prior analyses (belief type and validity testing behaviors) to investigate whether leaders might be more inclined to use certain validity testing behaviors in conjunction with a particular belief type.

Stage 4a: Analyzing for relationships between belief type and VTB

We investigated the relationship between belief type and VTB, first, for *all* key beliefs. Given initial findings about variability in the frequency of the VTBs, we chose not to use all five VTBs separately in our analysis, but rather the three categories of: 1) None (key beliefs that had no VTB applied to them); 2) VTB—Routine (the sum of VTBs 1 and 2; given those were much more prevalent than others in the case of both advocacy and inquiry); and 3) VTB—Robust (the sum of the VTBs 3, 4 and 5 given these were all much less prevalent than VTBs 1 and 2, again including both advocacy and/

or inquiry). Cross tabs were prepared and a chi-square test of independence was performed on the data from all 331 key beliefs.

Stage 4b: Analyzing for relationships between belief type and VTB

Next, because more than half (54.7%, 181) of the 331 key beliefs were not tested by leaders using any one of the VTBs, we analyzed a sub-set of the database, selecting only those key beliefs where leaders *had* disclosed the belief (using advocacy and/or inquiry). The reason for this was to ensure that any relationships established statistically were not unduly influenced by the data collection procedure which limited the time for the conversation to 10 minutes, during which it would not be feasible to fully disclose and address all key beliefs held by the leader. For this subset we prepared cross tabs and carried out chi-square tests of independence for the 145 key beliefs that leaders *had* disclosed. We again investigated the relationship between key belief type and VTBs, this time using a VTB variable with two categories: 1) More routine only and 2) More routine *and* robust.

Stage 4c: Analyzing for relationships between belief type and advocacy/inquiry dimensions of validity testing

Next, we investigated the relationship between key belief type and the advocacy and inquiry dimensions of validity testing. This analysis was to provide insight into whether leaders might be more or less inclined to use certain VTBs for certain types of belief. Specifically, we compared the frequency of utterances about beliefs of all three types for the categories of 1) No advocacy or inquiry, 2) Advocacy only, 3) Inquiry only, and 4) Advocacy *and* inquiry (4e). Cross tabs were prepared, and a chi-square test of independence was performed on the data from all 331 key beliefs. Finally, we again worked with the subset of 145 key beliefs that had been disclosed, comparing the frequency of utterances coded to 1) Advocacy *or* inquiry only, or 2) Both advocacy *and* inquiry (4f).

Results

Below, we highlight findings in relation to the research questions guiding our analysis about: the relative frequency in the types of beliefs leaders hold about problems involving others; the extent to which leaders employ validity testing behaviors in conversations about those problems; and differential patterns in leaders' validity testing of the different belief types. We make our interpretations based on the statistical analysis and draw on insights from the qualitative analysis to illustrate those results.

Table 4 Frequency and percentage of types of key beliefs held by leaders (n = 43)

	n	%
Problem description beliefs (PDB)	103	31
Problem explanation beliefs (PEB)	128	39
Problem solution beliefs (PSB)	100	30
Total	331	100

Belief types

Leaders' key beliefs about the problem were evenly distributed between the three belief types, suggesting that when they think about a problem, leaders think, though not necessarily in a systematic way, about the nature of, explanation for, and solutions to their problem (see Table 4). These numbers include beliefs that were communicated and also those recorded privately in the questionnaire or in writing on the conversation transcripts.

Patterns in validity testing

The majority of the 331 key beliefs (54.7%, 181) were not tested by leaders using any one of the VTBs, not even the behavior of disclosing the belief. Our analysis of the VTBs that leaders did use (see Table 5) shows the wide variation in frequency of use with some, arguably the more robust ones, hardly used at all.

The first pattern was more frequent disclosure of key beliefs than provision of the grounds for them. The lower levels of providing grounds is concerning because it has implications for the likelihood of those in the conversation subsequently reaching agreement and being able to develop solutions logically aligned to the problem (VTB4). The logical solution if it is the time that guided reading takes that is preventing a teacher doing 'shared book reading' (as Leader 20 believed to be the case) is quite different to the solution that is logical if in fact the reason is something different, for example uncertainty about how to go about 'shared book reading', lack of shared book resources, or a misunderstanding that school policy requires greater time on shared reading.

Table 5 Leaders' use of validity testing behaviors

	Advocacy		Inquiry		Total	
	n	%	n	%	n	%
VTB 1 Disclosing beliefs	136	41	75	23	211	64
VTB 2 Providing grounds	70	21	11	3	81	25
VTB 3 Exploring difference	9	3	2	1	11	3
VTB 4 Examining logic	2	1	2	1	4	1
VTB 5 Seeking agreement	19	6	3	1	22	7
Total	236	72	93	28	329	100

The second pattern was a tendency for leaders to advocate much more than they inquire—there was more than double the proportion of advocacy than inquiry overall and for some behaviors the difference between advocacy and inquiry was up to seven times greater. This suggests that leaders were more comfortable disclosing their *own* beliefs, providing the grounds for their *own* beliefs and expressing their *own* assumptions about agreement, and less comfortable in inquiring in ways that created space and invited the other person in the conversation to reveal *their* beliefs.

A third pattern revealed in this analysis was the difference in the ratio of inquiry to advocacy between VTB1 (disclosing beliefs)—a ratio of close to 1:2 and VTB2 (providing grounds)—a ratio of close to 1:7. Leaders are more likely to seek others' reactions when they disclose their beliefs than when they give their grounds for those beliefs. This might suggest that leaders assume the validity of their own beliefs (and therefore do not see the need to inquire into grounds) or that they do not have the skills to share the grounds associated with the beliefs they hold.

Fourthly, there was an absence of attention to three of the VTBs outlined in our model—in only very few of the 329 validity testing utterances the 43 leaders used were they exploring difference (11 instances), examining logic (4 instances) or seeking agreement (22 instances). In Case 22, for example, the leader claimed that learning intentions should be displayed and understood by children and expressed concern that the teacher was not displaying them, and that her students thus did not understand the purpose of the activities they were doing. While the teacher signaled her disagreement with both of those claims—"I do learning intentions, it's all in my modelling books I can show them to you if you want" and "I think the children know why they are learning what they are learning"—the fact that there were differences in their beliefs was not explicitly signaled, and the differences were not explored. The conversation went on, with each continuing to assume the accuracy of their own beliefs. They were unable to reach agreement on a solution to the problem because they had not established and explored the lack of agreement about the nature of the problem itself. We presume from these findings, and from our prior qualitative work in this field, that those VTBs are much more difficult, and therefore much less likely to be used than the behaviors of disclosing beliefs and providing grounds.

The relationship between belief type and validity testing behaviors

The relationship between belief type and category of validity testing behavior was significant ($X^2(4) = 61.96, p < 0.001$). It was notable that problem explanation beliefs were far less likely than problem description or problem solution beliefs to be subject to any validity testing (the validity of more than 80% of PEBs was not tested) and, when they were tested, it was typically with the more routine rather than robust VTBs (see Table 6).

Problem explanation beliefs were also most likely to not be tested at all; more than 80% of the problem explanation beliefs were not the focus of any validity testing. Further, problem description beliefs were less likely than problem solution

Table 6 Leaders' use of validity testing behaviors by key belief type

Key belief types	Validity testing behaviors						
	None		Robust VTIs		Robust and routine VTIs		total
	n	%	n	%	n	%	
Problem description beliefs (PDB)	39	37.9	52	50.5	12	11.7	103
Problem explanation beliefs (PEB)	103	80.5	24	18.8	1	0.8	128
Problem solution beliefs (PSB)	39	39.0	43	43.0	18	18.0	100
Total	181	54.7	119	36.0	31	9.4	331

0 cells (.0%) had expected count less than 5. The minimum expected count was 9.37. The 'routine' VTBs were disclosing beliefs and providing grounds, and the 'robust' VTBs were exploring difference, examining logic and seeking agreement

beliefs to be the target of both routine and robust validity testing behaviors—12% of PDBs and 18% of PSBs were tested using both routine *and* robust VTBs.

Discussion

Two important assumptions underpin the study reported here. The first is that problems of equity must be solved, not only in the macrosystem and exosystem, but also as they occur in the day to day practices of leaders and teachers in micro and mesosystems. The second is that conversations are the key practice in which problem solving occurs in the micro and mesosystems, and that is why we focused on conversation quality. We focused on validity testing as an indicator of quality by closely analyzing transcripts of conversations between 43 individual leaders and a teacher they were discussing problems with.

Our findings suggest a considerable gap between our normative model of effective problem solving conversations and the practices of our sample of leaders. While beliefs about what problems are, and proposed solutions to them are shared relatively often, rarely is attention given to beliefs about the causes of problems. Further, while leaders do seem to be able to disclose and provide grounds for their beliefs about problems, they do so less often for beliefs about problem cause than other belief types. In addition, the critical validity testing behaviors of exploring difference, examining logic, and seeking agreement are very rare. Learning how to test the validity of beliefs is, therefore, a relevant focus for educational leaders' goals (Bendikson et al., 2020; Meyer et al., 2019; Sinnema & Robinson, 2012) as well as a means for achieving other goals.

The patterns we found are problematic from the point of view of problem solving in schools generally but are particularly problematic from the point of view of macrosystem problems relating to equity. In New Zealand, for example, the underachievement and attendance issues of Pasifika students is a macrosystem problem that has been the target of many attempts to address through a range of policies and initiatives. Those efforts include a Pasifika Education Plan (Ministry of Education, 2013) and a cultural competencies framework for teachers of

Pasifika learners—‘Tapasa’ (Ministry of Education, 2018) At the level of the mesosystem, many schools have strategic plans and school-wide programmes for interactions seeking to address those issues.

Resolving such equity issues demands that macro and exosystem initiatives are also reflected in the interactions of educators—hence our investigation of leaders’ problem-solving conversations and attention to whether leaders have the skills required to solve problems in conversations that contribute to aspirations in the exo and macrosystem, include of excellence and equity in new and demanding national curricula (Sinnema et al., 2020a; Sinnema, Stoll, 2020a). An example of an exosystem framework—the competencies framework for teachers of Pacific students in New Zealand—is useful here. It requires that teachers “establish and maintain collaborative and respectful relationships and professional behaviors that enhance learning and wellbeing for Pasifika learners” (Ministry of Education, 2018, p. 12). The success of this national framework is influenced by and also influences the success that leaders in school settings have at solving problems in the conversations they have about related micro and mesosystem problems.

To illustrate this point, we draw here on the example of one case from our sample that showed how problem-solving conversation capability is related to the success or otherwise of system level aspirations of this type. In the case of Leader 36, underdeveloped skill in problem solving talk likely stymied the success of the equity-focused system initiatives. Leader 36 had been alerted by the parents of a Pasifika student that their daughter “feels that she is being unfairly treated, picked on and being made to feel very uncomfortable in the teacher’s class.” In the conversation with Leader 36, the teacher described having established a good relationship with the student, but also having had a range of issues with her including that she was too talkative, that led the teacher to treat her in ways the teacher acknowledged could have made her feel picked on and consequently reluctant to come to school.

The teacher also told the leader that there were issues with uniform irregularities (which the teacher picked on) and general non conformity—“No, she doesn’t [conform]. She often comes with improper footwear, incorrect jacket, comes late to school, she puts make up on, there are quite a few things that aren’t going on correctly....”. The teacher suggested that the student was “drawing the wrong type of attention from me as a teacher, which has had a negative effect on her.” The teacher described to the leader a recent incident:

[The student] had come to class with her hair looking quite shabby so I quietly asked [the student] “Did you wake up late this morning?” and then she but I can’t remember, I made a comment like “it looks like you didn’t take too much interest in yourself.” To me, I thought there was nothing wrong with the comment as it did not happen publicly; it happened in class and I had walked up to her. Following that, [her] Mum sends another email about girls and image and [says] that I am picking on her again. I’m quite baffled as to what is happening here. (case 36)

This troubling example represented a critical discretionary moment. The pattern of belief validity testing identified through our analysis of this case (see Table 7), however, mirrors some of the patterns evident in the wider sample.

Table 7 Illustrative case of the VTBs of Leader 36

	Inquiry or Advocacy	Advocacy					Inquiry				
		VTB1 Dis-closing key beliefs	VTB2 Providing grounds	VTB 3 Exploring difference	VTB 4 Examining logic	VTB 5 Seeking agreement	VTB1 Dis-closing key beliefs	VTB2 Providing grounds	VTB 3 Exploring difference	VTB 4 Examining logic	VTB 5 Seeking agreement
KB1_PDB_Case#36_Q_RHC	Validity testing behavior: leader's key beliefs: The teacher is communicating with a student in her class in an offensive manner	✓	✓	-	-	-	✓	-	-	-	-
KB2_PDB_Case#36_RHC	The relationships between the teacher and the student, as well as the teacher and the parent will be negatively impacted	✓	-	-	-	-	-	-	-	-	-

Table 7 (continued)

	Inquiry or Advocacy	Advocacy					Inquiry				
		VTB1 Dis-closing key beliefs	VTB2 Providing grounds	VTB 3 Exploring difference	VTB 4 Examining logic	VTB 5 Seeking agreement	VTB1 Dis-closing key beliefs	VTB2 Providing grounds	VTB 3 Exploring difference	VTB 4 Examining logic	VTB 5 Seeking agreement
KB3_PEB_Case#36_Q_LHC	Validity testing behavior: leader's key beliefs: Teacher does not adequately understand the student personally or their culture	-	-	-	-	-	-	-	-	-	-
KB4_PEB_Case#36_Q_LHC	The student has "compliance issues" that lead them to respond negatively to the teacher's communication style	-	-	-	-	-	-	✓	-	-	-

Table 7 (continued)

	Inquiry or Advocacy	Advocacy					Inquiry				
		VTB1 Dis-closing key beliefs	VTB2 Providing grounds	VTB 3 Exploring difference	VTB 4 Examining logic	VTB 5 Seeking agreement	VTB1 Dis-closing key beliefs	VTB2 Providing grounds	VTB 3 Exploring difference	VTB 4 Examining logic	VTB 5 Seeking agreement
KB5_PEB_Case#36_Q	I (Leader) have not previously informed the teacher of the negative impact of their comments	-	-	-	-	-	-	-	-	-	-
KB6_PSB_Case#36_Q_RHC	We should carry out a restorative meeting between the teacher, the student and myself	✓	-	-	-	-	✓	-	-	-	-

The leader, like the student's parents, believed that the teacher had been offensive in her communication with the student and also that the relationship between the teacher and student would be negatively impacted as a result. These two problem description beliefs were disclosed by the leader during her conversation with the teacher. However, while her disclosure of her belief about the problem description involved both advocating the belief, and inquiring into the other's perception of it, the provision of grounds for the belief involved advocacy only. She reported the basis of the concern (the email from the student's parents about their daughter feeling unfairly treated, picked on, and uncomfortable in class) but did not explicitly inquire into the grounds. This may be explained in this case through the teacher offering her own account of the situation that matched the parent's report. Leader 36 also disclosed in her conversation with the teacher, her problem solution key belief that they should hold a restorative meeting between the teacher, the student, and herself.

What Leader 36 did not disclose was her belief about the explanation for the problem—that the teacher did not adequately understand the student personally, or their culture. The problem explanation belief (KB4) that she did inquire into was one the teacher raised—suggesting that the student has “compliance issues” that led the teacher to respond negatively to the student's communication style—and that the teacher agreed with. The leader did not use any of the more robust but important validity testing behaviors for any of the key beliefs they held, either about problem description, explanation or solutions. And most importantly, this conversation highlights how policies and initiatives developed by those in the macrosystem, aimed at addressing equity issues, can be thwarted through well-intentioned but ultimately unsuccessful efforts of educators as they operate in the micro and mesosystem in what we referred to earlier as a discretionary problem solving space. The teacher's treatment of the Pasifika student in our example was in stark contrast to the respectful and strong relationships demanded by the exosystem policy, the framework for teachers of Pasifika students. Furthermore, while the leader recognized the problem, issues of culture were avoided—they were not skilled enough in disclosing and testing their beliefs in the course of the conversation to contribute to broader equity concerns. The skill gap resonates with the findings of much prior work in this field (Le Fevre et al., 2015; Robinson et al., 2020; Sinnema et al., 2013; Smith, 1997; Spillane et al., 2009; Timperley & Robinson, 1998; Zaccaro et al., 2000), and highlights the importance of leaders, and those working with them in leadership development efforts, to recognize the interactions between the eco-systems outlined in the nested model of problem solving detailed in Fig. 1.

The reluctance of Leader 36 to disclose and discuss her belief that the teacher misunderstands the student and her culture is important given the wider research evidence about the nature of the beliefs teachers may hold about indigenous and minority learners. The expectations teachers hold for these groups are typically lower and more negative than for white students (Gay, 2005; Meissel et al., 2017). In evidence from the New Zealand context, Turner et al. (2015), for example, found expectations to differ according to ethnicity with higher expectations for Asian and European students than for Māori and Pasifika students, even when controlling for achievement, due to troubling teacher beliefs about students' home backgrounds,

motivations, and aspirations. These are just the kind of beliefs that leaders must be able to confront in conversations with their teachers.

We use this example to illustrate both the interrelatedness of problems across the ecosystem, and the urgency of leadership development intervention in this area. Our normative model of effective problem solving conversations (Fig. 2), we suggest, provides a useful framework for the design of educational leadership intervention in this area. It shows how validity testing behaviors should embody both advocacy and inquiry and be used to explore not only perceptions of problem descriptions and solutions, but also problem causes. In this way, we hope to offer insights into how the dilemma between trust and accountability (Ehren et al., 2020) might be solved through increased interpersonal effectiveness. The combination of inquiry with advocacy also marks this approach out from neo-liberal approaches that emphasize leaders staying in control and predominantly advocating authoritarian perspectives of educational leadership. The interpersonal effectiveness theory that we draw on (Argyris & Schön, 1974) positions such unilateral control as ineffective, arguing for a mutual learning alternative. The work of problem solving is, we argue, joint work, requiring shared commitment and control.

Our findings also call for more research explicitly designed to investigate linkages between the systems. Case studies are needed, of macro and exosystem inequity problems backward mapped to initiatives and interactions that occur in schools related to those problems and initiatives. Such research could capture the complex ways in which power plays out “in relation to structural inequalities (of class, disability, ethnicity, gender, nationality, race, sexuality, and so forth)” and in relation to “more shifting and fluid inequalities that play out at the symbolic and cultural levels (for example, in ways that construct who “has” potential)” (Burke & Whitty, 2018, p. 274).

Leadership development in problem solving should be approached in ways that surface and test the validity of leaders’ beliefs, so that they similarly learn to surface and test others’ beliefs in their leadership work. That is important not only from a workforce development point of view, but also from a social justice point of view since leaders’ capabilities in this area are inextricably linked to the success of educational systems in tackling urgent equity concerns.

Appendix A

See Table 8.

Table 8 Distilling beliefs to key beliefs—coding rules

Example		Key belief	Note illustrating how rule was applied
Rules	Discrete beliefs		
1. Beliefs should be made more succinct in the key belief statement, and key words should be retained as much as possible	<p>I would much prefer to develop my skills as a teacher and further my career in education. [this quote?] Shows that she's in the teaching game as a job, not a career. The Principal has noticed that she has a somewhat apathetic attitude towards teaching</p> <p>The Music teacher isn't involved in any other areas of school life A social worker now runs a successful and popular choir within the school. I feel that this teacher lacks passion or the desire to change the way she runs the Music programmes</p> <p>I noticed on the feedback form that a number of students, if I've got the numbers right here, um, seven out of ten students in your class said that you don't normally start the lesson with a Do Now or a starter activity</p>	<p>Other party is apathetic</p>	<p>Note the synthesis of "apathetic", "isn't involved" and "lacks passion" into apathetic. Adjectives were used verbatim as much as possible</p>

Table 8 (continued)

Rules	Example	Key belief	Note illustrating how rule was applied
Discrete beliefs	<p>You still are not taking ownership of your management and should not rely on others to tell you as you are an experienced teacher, I'm wondering why you do not have any self-belief</p> <p>She asks what she should do rather than looking at her practice to see if she agrees or can challenge his reasoning</p> <p>She looks to others for support regularly.</p> <p>I was her support person as the NZEI rep when she felt maligned by the Principal in 2012 and also her team leader when appraising early in 2012.</p> <p>I gave her ideas and supported by modelling, thinking back she started to rely on me too much rather than taking the initiative</p>	Other Party is not taking ownership of improving their practice	<p>In this example, the language "not taking ownership" has been retained in the KB because it is stated initially in the questionnaire then revisited a number of times by Self</p>

Table 8 (continued)

Rules	Example	Key belief	Note illustrating how rule was applied
2. Judgment quality (i.e.: negative or positive) of the belief needs to be retained in the key belief	Discrete beliefs I don't believe she realizes the importance of her role, both in setting the tone through morning Prayer and the impact her incomplete attendance has on others. role, both in setting the tone through morning Prayer and the impact her incomplete attendance has on others I needed to check Jane knew what was required of a form teacher at the beginning of the year. I assumed, because she has been a form teacher in the past, that she would understand her responsibilities Jane doesn't understand the importance of her role as a form teacher and how her lack of effort to complete her responsibilities impacts on others. I also get the impression that she can be disorganised and her form class is a low priority time for her	Other Party does not recognise the importance of form teacher responsibilities	The phrases "don't believe", "doesn't understand" and "lack of effort" all identify the judgement quality as negative which is retained in the key belief

Table 8 (continued)

Rules	Example	Key belief	Note illustrating how rule was applied
3. Key beliefs should use overarching terms where possible	<p>Discrete beliefs</p> <p>There have been on-going concerns with Emily's teacher practice since she returned to teaching from maternity leave. The children in the classroom are not fully engaged in the learning while Emily is often disorganised with planning, assessment and classroom management</p> <p>Last year there were numerous children in the classroom that were identified as having behavior management problems as well as children who were not improving in there learning, this children have not had the same issues with their current teachers I am concerned that considerable time and effort have gone into supporting Emily to improve her practice with little to no change in the outcome</p>	<p>Other Party's behavior management and teaching practices are ineffective (disorganised)</p>	<p>Phrases such as "classroom teaching," "teacher practice," "planning, assessment and classroom management" and "behavior management" are expressed in the KB through the overarching term "behavior management and teaching practices."</p>

Table 8 (continued)

Rules	Example	Key belief	Note illustrating how rule was applied
4. The meaning and the object of the belief need to stay constant in the key belief	<p>Discrete beliefs</p> <p>[Teacher C] is well intentioned but tends to focus on resourcing rather than teaching and learning. She seems to be enthusiastic about each new teaching 'fad' spending considerable time setting up elaborate systems, e.g. homework websites. I am concerned that she works a lot harder than her students do</p> <p>From my observations, [Teacher C] tends to manage tasks and behavior in the classroom for the majority of the time, rather than a focus on learning</p> <p>Her students need help learning how to learn</p> <p>I have an idea of what it might be ([Teacher C]; Oh) because when I reflect on what is happening in some of my classes now I have been teaching a while, and I talk to some of your students and they, they usually know what the learning goals are but they are not always sure what those steps are to take ([Teacher C]; to get there) and um I had comments like um, oh I don't get how to balance equations, which is a common comment, you would probably get that in most chemistry classes. Um, and then when I tried to get them to tell me what part of balancing equations they couldn't do, they were less specific about what their next steps would be</p>	<p>Other Party spends too much time on preparation tasks and behavior over focusing on learning</p> <p>Students in class do not have adequate next steps (learning how to learn)</p>	<p>While the object of both KBs is the same (related to students learning) they are not merged into one KB because the subjects are different – the Other Party, and students</p>

Table 8 (continued)

Rules	Example	Key belief	Note illustrating how rule was applied
5. When reducing overlap the key idea of both beliefs need to be captured in the key beliefs	<p>Discrete beliefs</p> <p>Parent: Do you think maybe, possibly give me an email once a week just a quick update about how he's going and then I've got a rough idea about what's happening</p> <p>Leader: Okay I can do that for a few weeks, hmm and we can go from there. I think that's a good idea. If you are willing to put in some changes at home, I am willing to let you know how those changes are affecting his learning</p> <p>Parent: Shall I come in in a months' time or something? Keep a regular meeting?</p> <p>Me: Yeah, how about we do that? We'll make an appointment together, I'll email you and then maybe if we are a bit more regular with our communication, ah we'll be able to help [Student M] a little bit more and just keep things consistent?</p>	Self and Other Party (parent) need to communicate and meet more regularly	The teacher and parent discuss a number of ideas in generating a solution here. In both examples though, the key idea is for regular communication and specifically how they might carry that out

Table 8 (continued)

Rules	Example	Key belief	Note illustrating how rule was applied
6. Distinctive beliefs need to be summarized on their own and not combined with other beliefs	Discrete beliefs I believe [Teacher D] contributed to the concern by not being flexible for a unique, one-off situation [Teacher D's] inability to be flexible and consent to giving up a small amount of Faculty meeting time Speaking with [Teacher M], but not coming to speak to me directly [Teacher D's] unwillingness to speak with a staff member face-to-face about any issue that is difficult or might be confrontational	Other Party is unhappy the moderation that Self is suggesting takes time away from faculty meetings Other Party avoids resolving problems directly (afraid of confrontation)	The beliefs about other party being unhappy that moderation takes time from meetings, and avoiding problem resolution are related but are distinctive, hence there being a KB for each

Table 8 (continued)

Rules	Example	Key belief	Note illustrating how rule was applied
Subject of the belief must be retained in the key belief—own belief versus restated belief of other	<p>Discrete beliefs</p> <p>John's disregard for the need to build working relationships and the effectiveness of teamwork. This competitiveness has perhaps brought out the competitiveness in me. Another cause I believe is the Headmaster's reluctance to reign John in and his avoidance to have difficult conversations with his staff</p> <p>As you know last year you shared with me that you have some concerns about the reliability and validity of her data and, and how that data was probably recorded...she is not doing it right and the data that is coming through isn't good. You mentioned before that the running records that the reading recovery teacher have taken are very different (M: Yep very different results) producing very different results and you haven't had a discussion with her formally one on one about it</p>	The principal has avoided reigning Other Party in	The subject of the causal belief is the principal and is retained as the subject in the KB
8. All belief statements must be accounted for in key beliefs			

Appendix B

See Table 9.

Table 9 Example of analysis of distilling individual beliefs to key beliefs (Case 15)

Case 15 Key beliefs	Individual belief unique identifiers signaling case and source	Individual beliefs
Key belief 1: Other Party's behavior management and teaching practices are ineffective (disorganized)	B#232 (PDB LHC) Case# 15	Really, that is not what I saw when I came in and the children certainly could not articulate their learning
	B#233 (PDB LHC) Case# 15	Yes but it's now week 6 and you still haven't called his mum. You warnings aren't working!
	B#234 (PDB LHC) Case# 15	Nervous asking about shared book. I feel silly having to ask now about why no shared reading happening
	B#235 (PDB Q) Case# 15	There have been on-going concerns with [the teacher's] practice since she returned to teaching from maternity leave. The children in the classroom are not fully engaged in the learning while [The teacher] is often disorganized with planning, assessment and classroom management
	B#236 (PDB Q) Case# 15	She keeps the windows, doors and curtains of the classroom closed at all times so nobody can see what she is doing
	B#237 (PDB Q) Case# 15	Last year there were numerous children in the classroom that were identified as having behavior management problems as well as children who were not improving in there learning, this children have not had the same issues with their current teachers
	B#238 (PDB Q) Case# 15	The teacher is described by her team leader and previous professional leader at being very good at giving all the right answers when discussions around these issues happen however nothing changes in her practice
	B#239 (PDB Q) Case# 15	I am concerned that considerable time and effort have gone into supporting [the teacher] to improve her practice with little to no change in the outcome
	B#240 (PDB RHC) Case# 15	We have had several conversations recently where you have made comment about where you are in the Assessment to Learning [project] learning and how you feel you had it then and you don't have it now. So I want to have a conversation around why you think that

Table 9 (continued)

Case 15 Key beliefs	Individual belief unique identifiers signaling case and source	Individual beliefs
Key belief 5: Other Party should observe a competent teacher to develop own confidence and teaching practice	B#247 (PSB RHC) Case# 15	So I suppose the questions around that is. What would be more useful to you? Do you want to go in and see someone who at any level is competent at it or do you think it would be more useful for you to see some at your level?
	B#248 (PSB RHC) Case# 15	I think that's a really good idea. Okay so I think, I think the most important thing when you go and observe someone is to have in your mind a really clear, specific thing that you're looking at. So I'm thinking that what would be good is if I put together a little um promoting further learning observation sheet maybe?
	B#249 (PSB RHC) Case# 15	Okay and that would be quite good for you I think to have a look at um those children last year you struggled with as well
	B#250 (PSB RHC) Case# 15	Where we do promoting further learning and you could look at the differences of how I manage the kids and um whether some of those things would be helpful for you and in the same way giving me feedback on what you think I'm doing and you could be looking at whether um you know you can see some of those gaps in what I'm doing and suggest things you might have done. Through your programme, you know that learning you did last year so that would be good for you to think about all those things you learnt with behavior management

Appendix C

See Table 10.

Table 10 Validity testing behaviors coding rules

Rule Title	Advocacy			Inquiry		
	Rule	RHC exclusion	LHC exclusion	Rule	RHC exclusion	LHC exclusion
1.1 Disclosing Key Beliefs	Leader discloses belief/s about: problem nature (PDB), and/or cause/s (PEB) and/or solution/s (PSB) in ways that give access to their thinking about the nature, and/or causes and/or possible solutions to the problem	Leader must not: - ask a question/s that steer the other's responses towards Leader's key belief/s without ever disclosing own key belief/s - distort the urgency or seriousness relative to that expressed privately	Leader's thoughts must not indicate that they are being manipulative, leading or controlling For example, by indicating - that the disclosure has distorted or camouflaged the belief in order to minimize negative emotion - that evidence that contradicts own belief/s has been or is ignored, dismissed, or selectively interpreted - that LHC key beliefs contradict those expressed in RHC - that LHC key beliefs about the urgency, seriousness, or magnitude of the problem are notably different to those indicated in RHC	Leader invites other to disclose other's beliefs about OR other's response to leader's beliefs about: problem nature (PDB), and/or solution/s (PSB) in ways that indicate an openness to the other's thinking. NOTE: Not PEB Either directly, by: - inquiring into other's beliefs, opinions, views, thoughts OR - probing a volunteered opinion, or indirectly, by: - creating space for other's views through tentative, invitational or perspectival language	Leader must not: - ask a question/s that steer the other's responses towards Leader's key belief/s without ever disclosing own key belief/s After an inquiry utterance, Leader must not: - prevent or impede other from disclosing their beliefs OR - Be dismissive of other's beliefs OR - Fail to give space for other's response	Leader's thoughts must not indicate that they are being manipulative, leading or controlling or that they do not take other's statements at face value For example, by indicating: - that other's utterance/s is dismissed as dishonest / inaccurate / irrelevant - certainty about the motives of others (if untested) - persuasive rather than open-minded intent

Table 10 (continued)

Rule Title	Advocacy				Inquiry	
	Rule	RHC exclusion	LHC exclusion	Rule	RHC exclusion	LHC exclusion
2 Providing Grounds	<p>Leader provides grounds for own previously stated key belief about PDB, PSB or PEB</p> <p>Grounds include:</p> <ul style="list-style-type: none"> - explanations about how belief/s were reached, OR - educational rationalizations for belief/s, OR - examples to demonstrate reasoning for belief/s, OR - other relevant information (such as direct observation) 		<p>Leader's thoughts must not indicate that they are being manipulative, leading or controlling</p> <p>For example, by indicating:</p> <ul style="list-style-type: none"> - that the choice of grounds disclosed in RHC are intended to control the situation - that the grounds provided in RHC are intended to minimize negative emotion - grounds that are contradictory to or inconsistent with those indicated in the RHC - that other's grounds are dismissed as dishonest / inaccurate / irrelevant 	<p>Leader invites other to disclose grounds for other's previously stated key belief about PDB, PEB or PSB OR other's response to grounds for leader's previously stated key beliefs</p> <p>Either directly, by:</p> <ul style="list-style-type: none"> - inquiring into other's beliefs, opinions, views, thoughts OR - probing a volunteered opinion, <p>or indirectly, by:</p> <ul style="list-style-type: none"> - creating space for other's views through tentative, invitational or perspectival language 	<p>Leader must not:</p> <ul style="list-style-type: none"> - ask a question/s that steer the other's responses towards Leader's key belief/s without ever disclosing own key belief/s <p>After an inquiry utterance, Leader must not:</p> <ul style="list-style-type: none"> - prevent or impede other from disclosing their beliefs OR - Be dismissive of other's grounds for their beliefs OR - Fail to give space for other's response 	<p>Leader's thoughts must not indicate that they are being manipulative, leading or controlling or that they do not take the other's statements at face value</p> <p>For example, by indicating:</p> <ul style="list-style-type: none"> - that other's utterance is dismissed as dishonest / inaccurate / irrelevant - a lack of open-mindedness about the need to revise or reject own grounds - certainty about the accuracy of own grounds (if untested) - persuasive rather than open-minded intent

Table 10 (continued)

Rule Title	Advocacy				Inquiry	
	Rule	RHC exclusion	LHC exclusion	Rule	RHC exclusion	LHC exclusion
3 Exploring Difference	<p>Leader engages with difference and disagreement by identifying the key beliefs of both parties, describing them OR evaluating the contrary evidence that underpins the differing key beliefs</p> <p>Leader signals apparent points of difference or disagreement, including:</p> <ul style="list-style-type: none"> - differing key beliefs, OR - uses disconfirming evidence (as applied to both parties' key beliefs), OR - contrary evidence <p>OR Leader uses disconfirming or contrary evidence to:</p> <ul style="list-style-type: none"> - evaluate own and/or other's key beliefs AND - provide a comparative evaluation of differing beliefs 	<p>Leader must not:</p> <ul style="list-style-type: none"> - bypass a previously stated alternative point of view 	<p>Leader's thoughts must not indicate that they are being manipulative, leading or controlling</p> <p>For example, by indicating:</p> <ul style="list-style-type: none"> - That they have dismissed an alternative point of view - That they have changed own beliefs without critical examination of an alternative and without establishing the warrant for the alternative view to be stronger than the for their own view 	<p>Leader inquires into other's key beliefs about difference OR other's response to leader's key beliefs about difference,</p> <p>by helping other to signal apparent points of difference or disagreement, including:</p> <ul style="list-style-type: none"> - Differing key beliefs OR - disconfirming evidence, OR - contrary evidence <p>OR Leader must inquire into other's view of disconfirming or contrary evidence to:</p> <ul style="list-style-type: none"> - evaluate own or other's key beliefs, AND - provide a comparative evaluation of differing beliefs <p>Leader or other may change their key beliefs during examination of differences</p>	<p>After an inquiry utterance, Leader must not:</p> <ul style="list-style-type: none"> - treat a difference identified by other as an agreement OR - Encourage other to change their current beliefs unless warranted (tied specifically by leader to evidence in current discussion) OR - immediately rebut an alternative point of view OR - treat other's articulation of an alternative view as an opportunity to restate or elaborate their own view 	<p>Leader's thoughts must not indicate that they are being manipulative, leading or controlling or that they do not take the other's statements at face value</p> <p>For example, by indicating:</p> <ul style="list-style-type: none"> - a lack of open-mindedness about the other's beliefs about difference - persuasive rather than open-minded intent

Table 10 (continued)

Rule Title	Advocacy		Inquiry		LHC exclusion	RHC exclusion	LHC exclusion
	Rule	RHC exclusion	LHC exclusion	Rule			
4 Examining Logic	Leader states own view of the logic linking solutions to the nature and the cause/s of the problem	Leader must not: - indicate a preference for quick fix solutions without attention to the logic linking solutions to the nature and cause/s of the problem	Leader's thoughts must not indicate: that they are being manipulative, leading or controlling For example, by indicating: - a preference for quick fix solutions without attention to the logic linking solutions to the nature and cause/s of the problem	Leader inquires into other's logic OR other's response to the leader's logic linking solutions to the nature and cause/s of the problem by: - inquiring into their logic, opinions, views, thoughts OR - probing their volunteered logic	After an inquiry utterance, Leader must not: - immediately rebut an alternative point of view OR - treat other's consideration of linkage logic as an opportunity to restate or elaborate their own view OR - accept other's explanations about logic if there has been no inquiry into the logic that links proposed solution to problem cause(s)		

Table 10 (continued)

Rule Title	Advocacy				Inquiry	
	Rule	RHC exclusion	LHC exclusion	Rule	RHC exclusion	LHC exclusion
5 Seeking Agreement	<p>Leader signals warranted agreement about previously stated key beliefs</p> <p>Leader must:</p> <ul style="list-style-type: none"> - indicate where both parties agree with other's key belief(s) (if not already indicated previously), OR - check whether both parties have internal commitment to any solution beliefs. AND - ensure they have sought other's viewpoint on agreement if not already stated 	<p>Leader must not:</p> <ul style="list-style-type: none"> - request or require agreement where the other does not have internal commitment to the agreement OR - request or require agreement where either party does not consider the agreement to be warranted OR - assume agreement has been reached OR - agree to solutions proposed by other without seeking to ensure the agreement is warranted 	<p>Leader's thoughts must not indicate that they are being manipulative, leading or controlling</p> <p>For example, by indicating:</p> <ul style="list-style-type: none"> - a desire for agreement where the other does not have internal commitment to the agreement - a desire for agreement where either party does not consider the agreement to be warranted - a desire to hide or avoid evidence which may indicate agreement is not warranted - A belief that the other is not genuinely committed to establishing a solution for the problem that both parties are internally committed to 	<p>Leader inquires into other's view or other's response to leader's view of agreement as warranted in regard to any previously stated key beliefs</p>	<p>Leader must not:</p> <ul style="list-style-type: none"> - Immediately rebut the other's explanation of both parties' views of problem formulation and solution OR - Seek agreement for key beliefs that have unexplored grounds 	

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