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Introduction to Mixed Methods Approaches

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Community-based research, and the field of community psychology in particular, has increasingly embraced and called for the use of multiple methods (Barker & Pistrang, 2005; Tebes, 2005). Mixed methods research—also referred to as methodological eclecticism or methodological pluralism—involves combining quantitative and qualitative methods in a study in which multiple quantitative and/or qualitative methods are used in tandem (APA Task Force, 2006; Creswell & Plano-Clark, 2007; Molina Azorin & Cameron, 2010; Wiggins, 2011). Although mixed methods research typically refers to a single study, it also can encompass a series of studies addressing the same research questions that use multiple methods for inquiry.

This chapter is organized into four sections. The first section provides an overview of mixed methods research by providing a brief review of the history of mixed methods research, definitions, and key concepts. The second section focuses on how quantitative and qualitative methods have been integrated in research. In particular, it focuses on how methods can be integrated, as well as the benefits and challenges involved in conducting mixed methods research. The third section highlights several community-based research studies that utilized mixed methods, with a focus on the specific techniques for integration and how mixing methods can add to scientific rigor in such research. The chapter concludes with an example of a mixed methods study of a juvenile court system that illustrates these concepts.

INTRODUCTION TO MIXED METHODS RESEARCH

As there has been an increase in the development and use of diverse types of community-based research methods, there has also been an increase in debates around methodological pluralism and what scholars refer to as the *paradigm wars*—the inherent opposition of quantitative and qualitative methods (Howe, 1988; Wiggins, 2011). A *paradigm* refers to a worldview and its accompanying assumptions of how the world works (Kuhn, 1962). Paradigms and their sets of assumptions guide the structure and nature of questions and are so engrained that they are not usually examined in any great detail (Kuhn, 1962). In addition, for the purpose of clarity in this overview, *method* refers to the technical aspects of research (e.g., the procedures for collecting data), whereas *methodology* refers to the study of methods. Thus, regardless of the approach, the paradigm will influence the methodology that ultimately influences the choice of method for a study.

Historically, scholars have taken an either/or approach to using quantitative or qualitative methods, which has led many researchers to abstract that they are inherently opposed methodologies (Molina Azorin & Cameron, 2010; Wiggins, 2011). For example, quantitative research methods are born out of a positivistic/postpositivistic paradigm, whereas qualitative research methods belong to an interpretivist or constructivist paradigm. Thus, each is viewed as having a distinct epistemology, ontology, and axiology (see Dixon-Woods, Agarwal, Young, Jones, & Sutton, 2004, and Wiggins, 2011, for a more detailed review of the paradigmatic wars and discussion of the perceived incompatibility of methodologies).

Why Mix Methods?

There are a number of reasons and rationales for mixing methods. First, all research methods have their limitations. Most mixed methods studies

attempt to use both quantitative and qualitative methods to offset each other's strengths and weaknesses or mix methods to answer a research question or questions by all means available (Tashakkori & Creswell, 2007; Wiggins, 2011). In mixed methods research, methodological approaches are not necessarily seen as that rigid in terms of differences in how methodology should play out based on worldviews (Wiggins, 2011). In fact, some scholars would argue that methods should be mixed to utilize different perspectives to understand a phenomenon (Tashakkori & Creswell, 2007). Additionally, mixed methods can provide a more nuanced understanding of research questions than a single method can accomplish on its own (Molina Azorin & Cameron, 2010). For example, Palikas, Horwitz, Chamberlain, Hurlburt, and Landsverk (2011) identified that researchers tend to use qualitative methods for a topic with currently little research and/or for a more in-depth examination, but tend to use quantitative methods to test hypotheses and/or for generalization.

Over time there has been a greater acceptance and value of the use of both approaches, but the relationship between them and how to engage in meaningful integration has remained unclear due to each being born out of divergent philosophies of science (Wiggins, 2011). Other scholars have identified that the divergent philosophies of science from which methods are born is actually a strength of mixed methods research, because it can employ a dialectical perspective through engaging multiple worldviews (Greene & Caracelli, 1997). However, there is still not a consensus among methodological camps as to whether or not mixed methods research can—or should—utilize multiple worldviews or a single paradigm in a study (Creswell & Creswell, 2005).

INTEGRATING QUANTITATIVE AND QUALITATIVE METHODS

In mixed methods research, integration can occur at the level of the paradigm, the methodology, or the method. In determining mixed methods design, or type of integration, first the implementation and priority of data collection need to be considered (Molina Azorin & Cameron, 2010). In this context, implementation refers to the sequence in which data is collected (e.g., concurrently, sequentially), and priority refers to the emphasis each method is given (e.g., one method is dominant or both methods are equally emphasized) (Molina Azorin & Cameron, 2010). Second, the design can be predetermined or be emergent (e.g., evolving based on new opportunities or developments in a research project), but researchers should be explicit about why they are mixing methods (Molina Azorin & Cameron, 2010). Palinkas et al. (2011) outlined four key questions researchers can ask themselves when designing a mixed method study:

1. What is the rationale? Is the study dictated by data, by objectives, by research questions, and/or to complement the strengths/weaknesses of the various methods utilized?
2. What is the structure? How are the methods integrated together (see Morse's 1991 taxonomy)?
3. What is the function? Is the goal convergence of findings, providing complementary explanations, expanding upon previous findings, the development of an instrument, or for sampling purposes?
4. What is the process? Will data sets be merged together, connected in some type of sequence, or is one data set embedded within another?

Answering these questions up front will provide researchers with a framework for their research design and more meaningful integration of their methods.

Types of Integration

Most commonly mixed methods studies involve within-study integration of quantitative and qualitative methods to examine a research question (Wiggins, 2011). Traditionally, methods are mixed hierarchically, with one method usually being the dominant or more central method to the study—whether done implicitly or explicitly—while the other method acts in a supporting role (Molina Azorin & Cameron, 2010). Methods may also be mixed sequentially by first using an exploratory method for discovery and later using a confirmatory method for justification (Wiggins, 2011). For example, in a typical sequential mixed methods design, qualitative methods might be used first as an exploratory method to help develop survey items, and then quantitative methods would be used to explore the survey's

psychometric properties and utilize the survey to test a hypothesis.

Morse (1991) was the first scholar to develop a typology of mixed methods research designs using notation to represent each of the designs. In Morse's system the dominant method is represented using all capital letters (e.g., QUAN, QUAL) and the complementary method is represented using all lowercase letters (e.g., quan, qual). An arrow (→) is used to denote a sequential design, and a plus sign (+) is used to denote a concurrent design. Given Morse's typology, there are four types of mixed methods designs, with the potential for nine different combinations:

1. Equivalent, simultaneous designs (QUAL + QUAN)
2. Equivalent, sequential designs (QUAN → QUAL; QUAL → QUAN)
3. Dominant, simultaneous designs (QUAN + qual; QUAL + quan)
4. Dominant, sequential designs (QUAN → qual; quan → QUAL; qual → QUAN; QUAL → quan)

Wiggins (2011) outlined three ways in which mixing occurs at the level of method: (a) triangulation, (b) demarcation, and (c) reclassification. Triangulation has a long history in research using multiple methods. The purpose of triangulating is, by converging findings, to use multiple methods to increase the study's validity (Webb, 1966). Demarcation refers to how the methods are related (e.g., quantitative as the dominant method and qualitative as the secondary method). Reclassification refers to how both methods can be used in exploratory and confirmatory ways (Wiggins, 2011). Finally, Wiggins noted that methodological appropriation often occurs, deliberately and unintentionally, via blending the two methods within a single worldview. For example, methodological appropriation occurs in a postpositivistic paradigm where researchers transform qualitative data into numbers for statistical analysis or only use qualitative methods to lay the groundwork for a quantitative study.

Building upon Wiggins's (2011) overview of the paradigmatic issues in mixed methods research, Creswell and Plano Clark (2007) also provided a detailed account of multiple formats for mixing methods: (a) concurrent triangulation, (b) sequential/multiphasic designs, and (c) embedded designs. Concurrent triangulation involves simultaneous data collection and analysis allowing for the examination of convergent and divergent findings. For example, transforming qualitative data for quantitative analysis can reveal the ways in which findings do or do not fit. Sequential/multiphasic designs—the most prominent mode of mixing methods—focus on explanatory (quantitative data collection and analysis → qualitative data collection and analysis) and/or exploratory (qualitative data collection and analysis → qualitative data collection and analysis) processes. One rationale for an explanatory design is that qualitative methods can be used to strengthen the study by providing a deeper explanation and contextual analysis of the quantitative findings, whereas the rationale for an exploratory design might include strengthening the development of an instrument or exploring a phenomenon in depth before attempting to quantify it (Creswell & Plano Clark, 2007). A multiphasic sequential design may integrate different methods across multiple points in time (qualitative → quantitative → qualitative → quantitative → etc.) to converge the data (Creswell & Plano Clark, 2007). In both types of sequential/multiphasic designs, quantitative and qualitative results are usually reported separately (see Bartholomew & Brown, 2012, for a review). Finally, an embedded design involves using one data set to support the other data set either concurrently or in phases (Creswell & Plano Clark, 2007).

Tashakkori and Teddlie (2003) noted that other researchers have identified at least 35 distinct types of mixed method designs. This plethora leaves researchers with the challenge of figuring out, from this abundance of design choices, the optimal design for their research questions. Leech and Onwuegbuzie (2007) created a three-dimensional typology of mixed methods designs in order to address this issue to simplify design choices. The three dimensions include identifying (a) the level of mixing (e.g., fully mixed or partially mixed), (b) the timeframe for mixing (e.g., concurrent or sequential), and (c) the emphasis of each method (e.g., are they equal or is one method dominant?). Each of these integration techniques is useful for guidance in design choices and enables mixed methods researchers to speak a common language.

Finally, scholars should assess the quality of mixed methods research based on research

planning, design, data, and interpretation (O'Cathain, 2010). Given the history of these distinct types of research methods and the amount of integration techniques identified in the mixed methods literature, there are a number of benefits and challenges involved in mixing methods.

Benefits

There are multiple benefits that mixed methods research provides over and above a monomethod approach. First, using both quantitative and qualitative methods in a single study can address and combat each other's strengths and weaknesses (Wiggins, 2011). In particular, mixing methods can enhance the validity or trustworthiness of inferences and assertions by providing mutual confirmation of findings. For example, does one method facilitate our understanding of the results generated by another method (Molina Azorin & Cameron, 2010)? Mixed methods designs can provide deeper exploration of causal mechanisms, interpretation of variables, and contextual factors that may mediate or moderate the topic of study (Bartholomew & Brown, 2012; Molina Azorin & Cameron, 2010). Mixed methods research can facilitate the development of culturally appropriate instruments and foster a deeper understanding of the phenomenon of interest (Bartholomew & Brown, 2012). Finally, mixed methods designs can strengthen evaluations of interventions across disciplines and foster team-based research in which researchers can bring their own strengths and areas of expertise to the table (Bartholomew & Brown, 2012).

Challenges

Mixed methods research also poses a number of challenges to scholars interested in addressing a research question using both qualitative and quantitative approaches. Currently, although frameworks exist in different fields, there are no definitive guidelines for how to conduct a mixed methods study (Palinkas et al., 2011; Wiggins, 2011). In addition, there is great ambiguity in addressing the paradigm wars—incompatibility issues of mixing methods—and there are a number of challenges for synthesis of both across and within methods (Bartholomew & Brown, 2012; Dixon-Woods et al., 2004; Palinkas et al., 2011; Wiggins, 2011). For example, triangulating findings occurs at the level of method, which ignores the worldview issue (Wiggins, 2011).

There have been consistent calls both within psychology and across other disciplines for the development of a more comprehensive framework for the integration of methods (Wiggins, 2011). However, there are multiple technical limitations that need to be addressed in the mixed methods literature. For example, integrating multiple data sets is a complex task, especially when they come from different methodological traditions (Bartholomew & Brown, 2012; Molina Azorin & Cameron, 2010). There are also challenges in publishing due to page and word limits in journals (Molina Azorin & Cameron, 2010). There is a lack of in-depth training by scholars in both methodologies—mixed methods research requires a larger skill set than a researcher who only uses quantitative or qualitative methods (Bartholomew & Brown, 2012; Molina Azorin & Cameron, 2010). Also, by incorporating multiple methods in the design, mixed methods research takes longer to complete than a monomethod study, and typically more resources (e.g., time, financial) are needed to conduct such studies (Molina Azorin & Cameron, 2010). Additionally, researchers have noted that there is a need for greater specification of the types of qualitative methods utilized (Bartholomew & Brown, 2012). For example, in Palinaks et al.'s (2011) review, many of the studies did not provide detailed procedures regarding the type of qualitative analysis conducted. As with quantitative methods, there are multiple types of qualitative data analysis (e.g., grounded theory, analytic induction, narrative analysis, content analysis), and those types need to be expanded upon in the methodological literature and in empirical studies using multiple methods.

MIXED METHODS RESEARCH IN COMMUNITY-BASED RESEARCH

The use of multiple methods in community-based research has increased in recent years. This section provides four examples of such studies and how those studies integrated quantitative and qualitative data using the frameworks outlined in the previous section.

Campbell (1995) studied police perceptions of date rape using an integrated quantitative and qualitative design. First, she utilized quantitative structural equation modeling to identify relationship patterns of police perceptions of rape. She

identified a direct path between amount of officer experience and more sympathetic feelings about date rape victims, and found that trainings on rape mediated this relationship (e.g., police who received trainings had greater sympathy); this relationship then predicted less victim-blaming ideologies. Second, Campbell qualitatively examined police officer narratives in which content analysis was used to validate the findings from the quantitative portion of the study. For example, police officers with more experience and who received trainings on rape had less victim-blaming narratives on date rape. Campbell used quantitative and qualitative methods in tandem primarily for convergence of findings (e.g., the qualitative content analysis findings confirmed the quantitative structural equation modeling findings).

Salem, Foster-Fishman, and Goodkind (2002) studied collective action organizations' openness to innovation and organizational change using a quant → qual design. Phase I (the quantitative portion) examined leadership perspectives across 63 organizations. The organizations were surveyed to identify factors related to the organizational environment (e.g., perceptions/attitudes), the external environment (e.g., organizational network, funding requirements), chapter activities, and philosophies of service delivery. Phase II (the qualitative portion) involved interviews with chapter leaders using a modified grounded theory approach to identify emergent themes. Salem et al. primarily used a mixed methods approach to triangulate the different sources of data for convergent and disconfirming evidence (e.g., negative case analysis).

Using a quant → qual design, Ellis, March, and Craven (2009) examined the effectiveness of a peer support program for youth transitioning into high school. With respect to quantitative methods, the researchers utilized a longitudinal, experimental design with a control group and baseline measures to assess the program's effectiveness. They found that the program enhanced students' connectedness, resourcefulness, and self-concept as it related to school. After obtaining these results, Ellis et al. recruited a subsample of program participants for focus groups and open-ended surveys to understand the program from students' perspectives. The qualitative data were content analyzed to identify themes. As the qualitative data were used to confirm and expand upon the quantitative findings that indicated that the program provided benefit to youth transitioning into high school, qualitative methods were the supplemental method employed to enrich the quantitative findings.

Finally, Knox, Guerra, Williams, and Toro (2011) combined two studies to evaluate an evidence-based program, Families and Schools Together (FAST). The first study was a quantitative evaluation using linear growth models to assess the reduction of aggression in children up to 12 months following the program. The researchers found no differences between the treatment and control conditions with respect to reducing children's aggression, but the treatment condition did produce greater improvements in problem-solving skills and collective efficacy. To follow up the quantitative evaluation, the researchers conducted two focus groups to explore other potential outcomes that were not captured in the quantitative evaluation, through which they found that the intervention positively impacted family communication. In this design, Knox et al. utilized the qualitative data to enhance and expand upon the quantitative findings within a quant + qual framework. Both studies supported the finding that the intervention was not effective in reducing aggression but that there were other beneficial outcomes.

In summary, this brief highlighting of community-based studies suggests that the dominant mode of mixing methods is a quantitative → qualitative sequential design, with varying levels of emphasis on each method. Each of the studies reported the findings separately (e.g., separate sections in the results for reporting the data). Primarily, the qualitative data were used to supplement or expand upon the quantitative findings.

CASE STUDY

In recent years female juvenile offenders have comprised a growing proportion of juvenile court caseloads (Chesney-Lind & Shelden, 2004; Stevens, Morash, & Chesney-Lind, 2011). In particular, the greatest increase has been in violent offenses among girls (Puzzanchera, Adams, & Sickmund, 2010). This increase in official female juvenile delinquency is largely seen as a reflection of the change in system-level policies and practices (Javdani, Sadeh, & Verona, 2011; Stevens et al., 2011) and changes in arrest patterns through the "upcriming" of girls' offenses rather than an increase in actual criminal behavior (Schwartz & Steffensmeier, 2012).

Thus, there is a growing interest and investment in gender-responsive services among juvenile justice practitioners and researchers (Chesney-Lind & Irwin, 2008; Chesney-Lind & Shelden, 2004). Furthermore, there have been consistent calls for more rigorous evaluation studies on the effectiveness of gender-specific programming (Chesney-Lind, Morash, & Stevens, 2008; Kerig & Schindler, 2013; Zahn, Day, Mihalic, & Tichavsky, 2009).

Given the increased visibility of girls in the juvenile justice system, it is important to (a) examine how juvenile court personnel understand and respond to girls and (b) rigorously evaluate gender-responsive programming for girls. These foci informed the current mixed methods study. An emergent, mixed methods design was used to answer two research questions sequentially. The first question (quantitative) was developed within the context of a collaborative research team between Michigan State University and a juvenile county court system. The second question (qualitative) was developed after the quantitative study was completed as part of a broader qualitative study on how practitioners understand and utilize the construct of gender-responsivity in their service provision. Thus, this is a case example of a sequential explanatory mixed methods design.

Girls' Group Home Intervention Effectiveness With Propensity Score Matching

Given the calls for more rigorous program evaluation of gender-responsive services for girls in the juvenile justice system, an evaluation was conducted using archival court data regarding an out-of-home placement intervention designed to address the unique needs of girls involved with the system. The main research question asked what the effectiveness of this intervention was for girls who received the program compared to girls who did not receive the program with respect to their reoffense outcomes

The quantitative study compared reoffense outcomes for girls who received treatment in group homes (n = 172) and girls who received standard probation services (n = 816) for adjudicated females in a midsized, Midwestern county court between 2005 and 2012. Preliminary examination of sociodemographic and risk assessment variables indicated that the girls who received the group home placement had significantly higher baseline scores on the Youth Level of Service/Case Management Inventory (YLS/CMI)—the criminogenic risk measure that the court administers to youth—than the girls on standard probation. The two samples also significantly differed in age, with the group home girls being younger on average than the girls not receiving the treatment. Given these differences, it was important to compare girls in the two samples who had similar demographics and criminogenic risk profiles. To accomplish this goal, girls were propensity score matched on 11 theoretically salient variables (e.g., age, criminogenic risk assessment scores, race/ethnicity, initial offense type). Propensity score matching is a quantitative method to control for potential selection effects in a nonrandomized design and produces a statistical balance in the observed covariates used for analysis (see Stuart, 2010; Thoemmes & Kim, 2011).

The dependent variable for the study was recidivism and was collected via the court data management system. Recidivism was defined as any new petition to court 24 months following their initial YLS/CMI assessment for the comparison group and 24 months following exit from group home placement for the treatment group. If the girl aged out during the follow-up period, adult records were checked as well.

The group homes incorporate theoretically informed gender-responsive elements, such as girls' pathways into the system (e.g., addressing trauma, abuse, and neglect) and relationships (e.g., focusing on the centrality of relationships, inclusion of girls' voice, and sense of connection to others). Of particular interest was the group homes' use of the Girls Moving On (GMO) gender-responsive curriculum. GMO is a gender-responsive cognitive-behavioral treatment program for at-risk girls between the ages of 12 to 21 years old (Orbis Partners, 2014). The program's main goal is to provide girls with skills and resources, increase girls' capacity for healthy relationships, and to reduce girls' risk for juvenile and criminal justice system involvement.

After the propensity scores were created, group home girls were matched to non–group home girls having the closest possible propensity by using a 1:1 nearest neighbor ratio. In other words, this procedure created a probability variable for receiving treatment based on the selected covariates and created a group of 172 non–group home girls with near-identical demographic and risk profiles as the comparison sample. Analysis of the outcome data

indicated that the girls' group home sample had significantly lower recidivism rates at both 1-year (20% vs. 27%) and 2-year (27% vs. 37%) follow-up than did the comparison sample. Thus, it is likely that the group home intervention reduced girls' recidivism rates two years following release from the program.

Gender-Responsivity in the Juvenile Justice System

The qualitative portion of the study came from a larger study on how juvenile court practitioners detect and respond to the needs of girls. In particular, the researchers were interested in addressing the ambiguity in what gender-responsivity entails and means to those implementing the services. Data collection involved interviewing juvenile court personnel (n = 39), including court officers, programs/services managers, judges, and administrators, about their experiences working with girls and the services the court and the community provide to youth. The second part of the qualitative study included case discussions with juvenile court officers (n = 24). The purpose of the case discussions was to provide an in-depth illustration of current cases of girls involved in the system. The interviews and case discussions provided rich, detailed data for understanding the context of why girls are involved in the system, the services they receive, and the perceived successes and failures of those services.

Because data collection began after the quantitative evaluation was complete, the lead author on both projects was able to add additional questions in the semistructured qualitative interviews and case discussions about the girls' group homes. In particular, given that the findings from the quantitative study had revealed that group home girls fared better two years following release from the program than girls with similar risk and demographic profiles who did not receive treatment, the next question to ask was why is this the case? Why did court practitioners send girls to the group home? What makes this program gender-responsive? Why is this program more effective for higher risk girls over and above standard best practices in juvenile justice treatment?

The qualitative data were analyzed using directed and conventional content analytic approaches (see Hsieh & Shannon, 2005, for a review of types of qualitative content analysis). The directed approach allowed the researchers to examine how elements of gender-responsivity, as defined in the literature, were or were not integrated into treatment and to what extent they were integrated (e.g., how frequently were court personnel discussing each element, such as using trauma-informed approaches to intervention, helping girls build healthy relationships with their families, etc.). The conventional content analytic approach revealed more information related to why practitioners view the group homes as effective for girls. For example, juvenile court officers frequently mentioned that girls have different needs than boys and that those different needs should be reflected in programming. The group homes are the only programs in the county specifically designed for girls in which they focus on addressing girls' trauma in a safe environment. The qualitative findings provided rich descriptions of program elements, success stories about girls who went to the group homes, and other very detailed information that could not have been obtained with the archival data used for the quantitative evaluation.

Integrating Methods

This study utilized a sequential explanatory mixed methods design (with quantitative data collection and analysis leading to qualitative data collection and analysis) in an attempt to understand (a) the effectiveness of a gender-responsive intervention for girls in the juvenile justice system, and (b) why this type of intervention modality is needed for girls in the juvenile justice system, and (c) the underlying mechanisms that make the intervention gender-responsive. The four questions that Palinkas et al. (2011) called for researchers to ask when designing a mixed methods study (see earlier) were addressed as follows:

1. What is the rationale? The study was primarily dictated by data (i.e., archival data for the quantitative piece and interviews for the qualitative piece). The secondary rationale was to address the emergent research questions in the qualitative study that evolved based on opportunities and new developments throughout the research process.
2. What is the structure? The methods were integrated in an equivalent sequential, explanatory design (QUAN → QUAL) in

which the quantitative data were collected and analyzed prior to the data collection and analysis of the qualitative data (Creswell & Plano Clark, 2007; Morse, 1991).

3. What is the function? The study's primary goal was to expand upon the previous quantitative findings using the qualitative data for explanatory purposes.
4. What is the process? The process of integration involved connecting the two data sets in a sequence (e.g., quantitative evaluation first, qualitative exploration second).

This case study demonstrated how mixed methods research can utilize qualitative findings to build upon quantitative findings. The qualitative study was able to identify other areas where the quantitative data set was limited. For example, the quantitative study was limited by measuring only recidivism as the outcome of interest. The qualitative findings revealed that the group home increased girls' safety in general, provided them with additional treatment hours to address trauma-related issues, and worked at helping girls either (a) reunite with their family by focusing on building and restoring positive relationships or (b) transition to independent living if going back to their family was not the best option.

CONCLUSION

In summary, this chapter has attempted to show how researchers can integrate quantitative and qualitative data, to present the benefits and the challenges of mixing methods, and some illustrations of mixed methods community-based research. There are certainly multiple directions (e.g., exploring different typologies for mixing methods beyond the typical quant → qual sequential design used in the literature) for researchers to take in order to expand the empirical literature on mixed methods approaches. We look forward to continued developments in this area in the coming years.

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