Journal of Interprofessional Care, 2012, 26: 6–12

ISSN 1356-1820 print/ISSN 1469-9567 online
DOI: 10.3109/13561820.2011.598640

informa
healthcare

A critical realist model of complexity for interprofessional working

Rick Hood

Royal Holloway University of London, Criminology and Sociology, Egham Hill, Egham, Surrey TW20 0EX, UK

This paper presents a theoretical model of complexity for considering issues relevant to interprofessional working. The need for such a model is introduced with reference to the literature on collaboration and integration in health and social care, particularly in children's services. It is argued that interprofessional working is often seen as a response to complexity, but that current models fail to build an appreciation of complex causality into their approach to addressing needs through targeted interventions.
The alternative offered here is a critical realist model based on Bhaskar's domains of reality, focusing on the implications of open systems, complex causality and contingency. These ideas are used to examine some of the issues and dilemmas typically encountered by interprofessional networks in coming together to work on complex cases.

Keywords: Complexity, concept analysis, interprofessional collaboration, interprofessional practice, protection

INTRODUCTION

The starting point for this paper is that interprofessional working becomes necessary in order to deal with complex problems that defeat the expertise of professionals working separately or on their own. At the same time, collaboration can be undermined by complexity that arises from characteristics of the team or network itself. Studies of interprofessional working have often focused on ways of addressing the latter in the hope that this will enable groups of professionals to resolve the former, i.e. how to design services in order to promote positive outcomes in "complex cases" and therefore on a broader scale address a range of "joined-up" social problems (Atkinson, Jones, & Lamont, 2007; Brown & White, 2006; Sloper, 2004). Such studies have greatly increased our knowledge of "barriers" and "facilitators" to collaboration, contributing to a view that organizations can implement managerial models that in turn facilitate effective interprofessional practice (Leathard, 2003). A good example of this approach in children's services is the model of the "children's trust," whose successive layers of multi-agency arrangements are envisaged as a quasi-ecological system of care, with "better outcomes for children" at the center (Department for Children Schools and Families, 2010, p. 8). For frontline workers, the result has arguably been a shift in emphasis from individual interactions and relationships with clients to a more systemic idea of casework (Ferguson, 2010) occurring in mutable interprofessional contexts (Warmington et al., 2004).

As always in this area there is a problem of terminology: how to define collaboration as well as the group that collaborates. For the first part, the preferred term in this paper is "interprofessional working," to indicate a focus on practitioners working together on cases in which there is a joint clinical interest. The more usual term, "interprofessional collaboration," is increasingly used as a superordinate concept that covers organizational and educational interventions as well as interprofessional practice (e.g. Leathard, 2003; Reeves et al., 2011). As for the second part, official guidance refers to the "team around the child" (Department for Children, Schools and Families, 2008) when it comes to children with complex needs, or to the "core groups" (Department for Education and Skills, 2006) who implement child protection plans. Neither term really refers to a "formal" team as such, since members are usually employed and managed by different agencies, and coalesce on an *ad hoc* basis around specific cases. Indeed, often they will be based on more formal teams within their own agencies. Ovretveit (1993) uses the term "network association" for this kind of arrangement in his typology of adult mental health teams, while Warmington et al. (2004), drawing on Engeström's (2001) activity theory, suggest "knotworking" instead. Here the preference is for "interprofessional network," in order to capture a sense of practitioners being situated at the intersection of multiple, interacting systems, rather than within a stable and defined team structure.

Interprofessional working is often associated with the quasi-ethical principle of putting the user at the heart of service provision (Irvine et al., 2002). Crucially for what

Correspondence: Rick Hood, Centre for Criminology and Sociology, Royal Holloway University of London, Egham, TW20 0EX.
E-mail: rick.hood.2009@live.rhul.ac.uk

Received 16 November 2010; revised 19 May 2011; accepted 15 June 2011

follows, the concept of "child-centered" services is also a "needs-focused" approach, drawing on ideas of social investment and the "preventative state" (Fawcett, Featherstone, & Goddard, 2004; Spratt, 2009). These suggest that services should try to build on protective factors and counteract risk factors in a child's individual, familial and social background, by targeting them with supportive or assertive interventions, based on need, as early as possible in their childhood development. Furthermore, to maximize their effectiveness, specialist interventions should, as far as possible, be "evidence-based," or "evidence-informed," meaning that identified problems are to be tackled with strategies that have already been shown to have had an observable and measurable impact in external, scientific evaluations (Sanderson, 2006). Taken together these ideas have led to a rather technocratic ethos in child safeguarding policy, based on "scientific understandings of cause and effect and the possibility of prediction, together with the capacity for positive intervention by government in social life" (Parton, 2006, p. 989). It is a tendency that has been criticized (e.g. in Ayre & Preston-Shoot, 2010) for encouraging an erosion of confidence in the type of professional judgments that are necessary for an evidence-based approach to be applied effectively in complex clinical decisions (Sackett et al., 1996). Such criticisms may point to the need for the "needs-led" model of interprofessional working to have greater sensitivity to complexity. To make it clearer what is meant by "complexity" in this context, some relevant theoretical perspectives are introduced below.

PERSPECTIVES ON COMPLEXITY

Complexity is often used in a metaphorical sense to refer to the difficulty of resolving multiple and interrelated problems, or what have been called "wicked problems" that defy technical solutions (Devaney & Spratt, 2009). In the field of children's services, there has been some interest in adapting theories of complex systems to explain the challenges of frontline settings such as child safeguarding, in which events can move in volatile and unexpected ways (Nybell, 2001; Stevens & Cox, 2008). In these contexts, complexity theory is mostly used as a conceptual framework to describe the processes of change in complex open systems; in particular, how internal feedback or externalities can give rise to unexpected consequences, or how outcomes can emerge suddenly from a critical state of transition, rather than conforming to stable, predictable patterns of cause and effect (Thelen & Smith, 1994). This retrospective use has been readily invoked in models of accident analysis (Rasmussen, 1997), which in turn have been applied to serious case reviews of deaths from child abuse (Fish, Munro & Bairstow, 2008).

While these are valuable applications, the problem with complexity theory is that its origins in mathematical models developed for the natural sciences mean it has developed as a "rhetorical hybrid" (Thrift, 1999) able to explain social phenomena in terms that could be characteristic of any complex adaptive system. But this metaphorical flexibility comes at a price, so that complexity theory has little to say, for example, about the interpretative and communicative uncertainties that bedevil our understanding of the social world. This may account for the fact that psychodynamic approaches are more prevalent than complexity theory when it comes to understanding why relationships and behavior in collaborative settings can develop in unexpected ways (Conway, 2009; Menzies-Lyth, 1988; Woodhouse & Pengelly, 1991). More recently, Cooper, Braye, & Geyer (2004) has made a case for using complexity theory as a conceptual foundation for interprofessional education. The contrast that she draws between "mainstream linear" frameworks of predictability and control, and a framework geared more toward complexity, emphasizing connectivity, diversity and adaptability, is relevant to the argument developed here, which uses a critical realist standpoint to apply some of the insights of complexity theory to interprofessional working. The next section will proceed to outline Roy Bhaskar's critical realist approach and discusses its relevance for complexity.

BHASKAR'S CRITICAL REALISM AND COMPLEXITY

Critical realism is based on the work of Bhaskar (e.g. 2008, 1989), whose scientific philosophy elaborates on the distinction between ontology (notions about the nature of what exists) and epistemology (the nature, conditions and limits of our knowledge), which he argues are conflated by other perspectives such as positivism and social constructionism. Critical realist ontology posits a reality that exists outside our perception of it, differentiated into three levels: the empirical, the actual and the real. The empirical consists of what we experience through our senses; the actual comprises all events, regardless of whether they are observed or experienced; and finally the real, which contains the underlying causal mechanisms that generate events. These mechanisms may not be directly observable on the empirical level, but they are nonetheless real because they cause things to happen, e.g. natural forces such as electromagnetism. Importantly, cause and effect is transmitted through discretely structured but open systems; the interactions of one causal mechanism will influence the operation of others, so that the outcomes of any intervention are never predictable: mechanisms produce only "tendencies" that can be counteracted by others. For example, the causal force of gravity can be temporarily overridden by other mechanisms such as the aerodynamic tendencies of aeroplane wings (Collier, 1994).

In the social world, the dimension of human agency greatly increases the complexity of interactions and the difficulty of formulating causal explanations. Understanding social phenomena involves a "double hermeneutic" of interpreting other people's interpretations (Danermark et al., 2002). Unlike the objects of natural science, people can actively transform their own social world, just as their actions and perceptions are shaped by pre-existing social structures. Because our knowledge is conceptually mediated, critical realism rejects the idea that scientifically conducted observation and analysis can enable us to arrive at an

objectively "true" picture of reality. Critical realism accepts that facts and observations, scientific or not, are dependent on interpretation. However, this does not mean that facts are determined by theory; because there is always an "intransitive" object of science that is independent of our "transitive" scientific account of it, some theories have more explanatory power and practical validity than others. Other critical realist ideas, such as stratification and emergence, are not so relevant to the present discussion, although they do provide some conceptual links to complexity theory. Indeed, some writers have explicitly drawn on critical realism to theorize the study of complex social systems (e.g. Harvey & Reed, 1996). In this paper, the link between critical realism and complexity is taken to be a mutual concern with the issue of causality in open systems, which is then supplemented by critical realism's methodological insights into how we understand and explain how the world works. This gives rise to two interlinked areas of complexity as illustrated in Figure 1, which is based on Bhaskar's (2008, p. 13) three domains.

Complexity is conceptualized first at the intersection of the real and actual, in which it relates to the operation of causal tendencies to generate effects in the world (causal complexity). Second, complexity occurs at the intersection of the actual and empirical, in which we engage in an active, social process of creating the meanings through which those events become concrete experiences and perceptions (reflexive-hermeneutic complexity). In the following section, these ideas will be used as the basis for a model that can be applied to interprofessional working.

A CRITICAL REALIST MODEL OF COMPLEXITY

Going back to the initial premise that interprofessional working is a response to complexity in the shape of multiple and interrelated problems, Figure 2 shows a "naive realist" model of dealing with complex needs. They are disaggregated into separate needs (N1, N2, etc.), which are then targeted by specific interventions (I1, I2, etc.) delivered by the appropriate professionals with pre-defined outcomes in mind (O1, O2, etc.). The results of each intervention are periodically reviewed and compared with the stipulated changes before being fed back into the overall planning and coordination of services, until eventually the desired outcomes have been achieved. On a larger scale, the model also shows how evidence can be accumulated about the effectiveness of interventions in achieving outcomes from initial presenting problems, especially if outcomes are measured in the form of quantitative indicators.

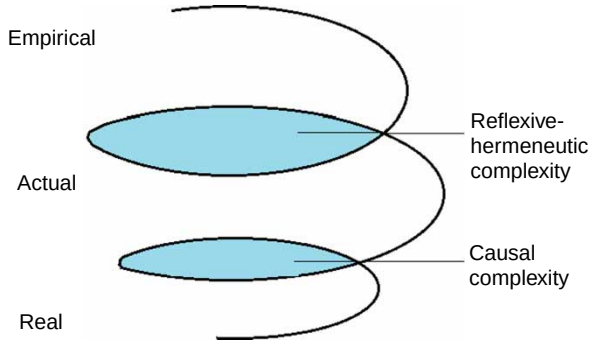

Figure 1. Two views of complexity using Bhaskar's domains.

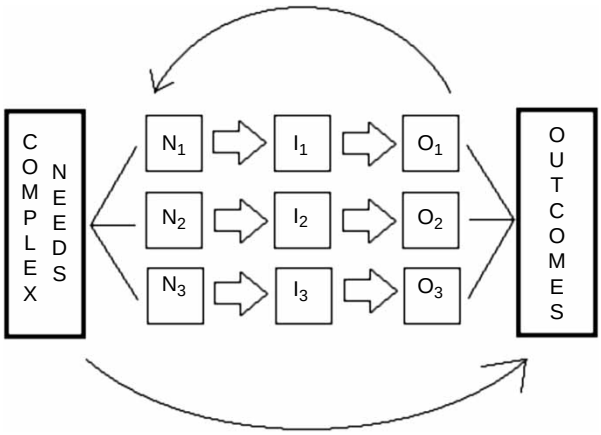

Figure 2. A naive realist model of complex needs.

From a critical realist standpoint, there are a number of problems with this approach, which is why it has been labeled a "naive realist" model. By disaggregating complex needs into separate, profession-specific needs and treating these separately, causality is effectively treated as non-complex and linear. It assumes a series of closed systems in which individual needs are directly susceptible to treatment by professional intervention. This is not to say that all interventions are assumed to be effective, but that cause and effect is assumed to be about regularity; if an intervention is observed to have the desired effect in one or more cases, there is a likelihood that it will work again in another case. In critical realist terms, this is a misrepresentation of how causality works. Social phenomena are the product of multiple, interacting tendencies at the underlying level of the "real." Their structural properties may well give them causal powers or "liabilities" of their own, but these are not necessarily realized or even observed (Sayer, 2010). Thus, an intervention such as counseling may well "work" in the sense that its causal powers are invoked by someone attending regular counseling sessions, but other mechanisms will also be at work and may have a counteractive effect. In open systems, which social systems always are, any given object with its necessary (internal) relations of structure and mechanism will always be subject to contingent (external) relations with other phenomena, which have their own causal tendencies (Danermark et al., 2002; Sayer, 2010). Any given need, however disaggregated, will be complex in its own right. This is illustrated in Figure 3, which is adapted from Sayer (2000, p. 15).

Here the ontological "depth" offered by critical realism is used to show how events are generated from the interplay of causal tendencies, which are implicated in the necessary and contingent relations within and between different objects or

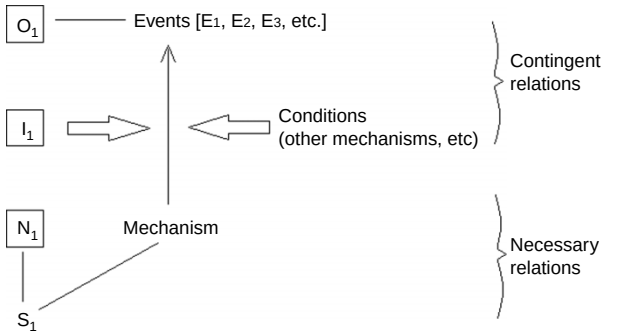

Figure 3. Complex causality: necessary and contingent relations (adapted from Sayer, 2000).

entities in an open system. This contrasts with the "flat" empirical approach offered by the naive realist model outlined earlier. Effective interventions might result from an informed conception of the structural properties (S1) of a particular need (N1) – possibly by aiming to counteract the causal mechanisms associated with that need. For example, it might be supposed that overcrowded housing conditions have a tendency to aggravate family disputes and, therefore, a move to a bigger flat will help resolve a particular family's problems in this regard. Another strategy might be to fund local community resources to keep the children occupied after school, hence counteracting the malign effect of overcrowding by engaging quarrelsome siblings in positive activities. However, whichever of these interventions is adopted (I1) has only a contingent effect on what happens in the system. A wide range of other conditions exert an influence, including other needs and interventions, individual characteristics of the family and wider social structures, e.g. of poverty or deprivation. Furthermore, out of all the possible events that could and do take place (E1, E2, E3, etc.), only certain observations and experiences will be apprehended and recorded as the outcome for this particular intervention (O1). It is in relation to these half-submerged processes of causal complexity that the interprofessional network conducts its business.

However, causal complexity is only half the problem, for there are additional difficulties involved in acquiring and acting on knowledge about social phenomena. This process has been described as "reflexive-hermeneutic complexity," in an attempt to encapsulate the active way in which we make sense of our experience of the world, as filtered through our cognitive and conceptual schema, and through our relations with others. For professionals as for scientists, knowledge about the social world relies on a "double hermeneutic" of understanding; applying one's "expertise" is as much a social as an individual process, shaped by a large number of factors, including what we have learned or are mandated to do, but also by our interactions with clients and other members of the interprofessional network. These considerations inform the model of complexity for interprofessional working illustrated in Figure 4. Referring back to the two types of complexity identified earlier, the model shows how causal complexity is responsible for change in the form of actual events on the right-hand side of the model, while reflexive-hermeneutic complexity shapes the behavior of the interprofessional network in the center, as it tries to understand and influence the nature of that change.

Given the level of abstraction so far, it might be worth using a hypothetical case scenario to explain what the model is talking about. Consider the situation of an interprofessional network, or "core group," involved with a young mother and her 18-month-old child, who is subject to a child protection plan. The main concerns are around mother's inconsistent parenting as well as reports of domestic violence involving her partner. Causal complexity here relates both to immediate risks to the child as well as to longer-term developmental outcomes. While needs may be partly based on "empirical" events (e.g. police being called to the property because of a violent dispute), they are also defined in relation to frameworks of interpretation. For example, there will be a medical diagnosis of health, based on the GP's and health visitor's judgments as well as evidence-based templates, e.g. height and weight charts, developmental milestones. Other frameworks, such as theories of attachment, may be deployed

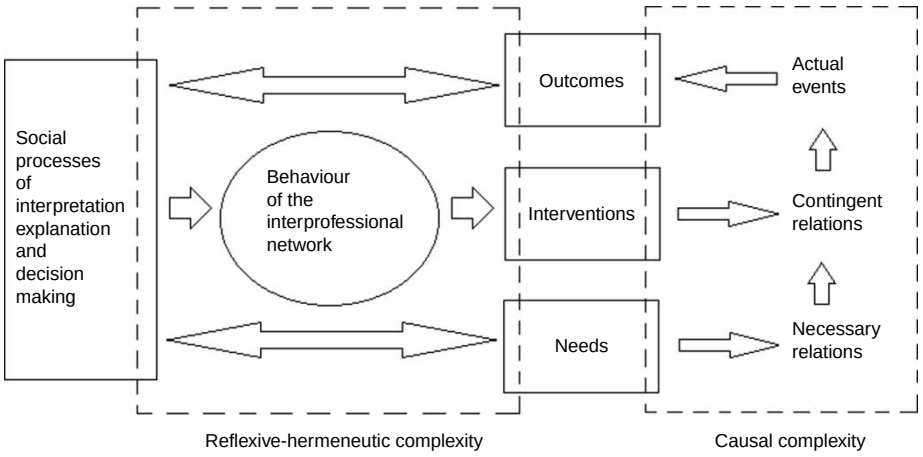

Figure 4. Complexity and interprofessional working.

in order to evaluate parental responsiveness and bonding. In addition, the mother's level of engagement with services, her acknowledgment of concerns and readiness to act on professional advice may influence how needs (and, therefore, risks) are perceived. Decisions made on the basis of these judgments may lead to different kinds of intervention – for example a residential parenting assessment, a "written agreement" about who is allowed in the home, a full-time nursery placement, a referral for counseling or family support. Similar processes occur in relation to outcomes – for example if after a few months staff at the nursery report the child to be thriving, how much is this down to an improvement in parental care-giving? Outcomes may be interpreted as confirmations of hypotheses, or as signaling a type of change occurring in the system.

Complex causality points to the potential volatility of events, which is a key consideration for risk assessment. At the same time, an understanding of causal mechanisms is crucial if interventions are to have a longer-term influence on outcomes. Services may function well in terms of monitoring a child's welfare, but may not necessarily be targeting the underlying causes of need. In addition, once services are in place the behavior of the network is subject to unpredictable dynamics of its own. In complex cases such as the one outlined above, interprofessional networks usually perform complementary duties of care and control. This is often manifested as a "split" in the way family members perceive and treat different professionals – typically with the social worker as an authority figure in contrast to others who are perceived as more benign and supportive. How the network deals with these dynamics will vary on a case-by-case basis, but may be crucial for collective action and decision-making. In short, since everything the network does will feed into the contingent relations that help to generate outcomes, its behavior should be viewed as a whole, and not as an agglomeration of "separate" interventions.

INTERPROFESSIONAL IMPLICATIONS

So what are the implications of all this for interprofessional working? To begin with, the critical realist perspective offers a critique of the positivist assumptions that often underlie models for interprofessional collaboration (Leathard, 2003). Bhaskar has observed that positivism can perform an ideological role in promoting "technocratic expertise and managerial authority" (Bhaskar, 2009, cited in Collier, 1994, p. 104), which certainly seems to be a recurrent theme in the analysis of what has "gone wrong" in children's services, especially in the English context, over recent years (Ayre & Preston-Shoot, 2010). A related point concerns the naive realist (i.e. positivist) view of interprofessional networks as "implementing" scientifically proven interventions in order to address individual needs. In fact, this is a bowdlerization of the original concept of evidence-based medicine, which explicitly was about "integrating individual clinical expertise and the best external evidence" (Sackett et al., 1996), rather than replacing the former with the latter. Assuming that disaggregated needs can be resolved by standardized assessments and treatments largely ignores the implications of open systems, which require the judgment of expert practitioners to be applied on a case-by-case basis. Yet the latter seems precisely what prescriptive templates such as the common assessment framework end up undermining (White, Hall, & Peckover, 2009).

A broadly functional way of managing complexity envisages a type of interprofessional practice characterized by coordination and information sharing, an arrangement between agencies and practitioners to agree on "clear goals" and responsibilities, on "open and honest" communication, and so on (Stewart, Petch, & Curtice, 2003, p. 339). Yet setting up an "expert system" can only increase complexity (Lash, 2000), as each member brings new judgments and hypotheses to bear on a situation, contributes their own actions and decisions and establishes new interconnections. All of this will feed into causal complexity as well as increase the overall uncertainty of communication and decision-making. To get past this, interprofessional networks need a kind of "double reflexivity," to go with the "double hermeneutic" referred to earlier. They must integrate all the various pieces of expertise, experience and knowledge available to deal with the case in hand, while also managing the social processes entailed in doing so. Complexity means that the dynamics will change on a case-by-case basis, requiring a kind of reflexive adaptability that goes beyond protocols and guidelines. In other words, the network needs to be helped *as a network* to reflect on its own processes of understanding and communication (c.f. Reder & Duncan, 2003). This could involve some form of clinical, or group, supervision, which allows scope for creative disagreement as well as for consensus on "routine" forms of coordination and task-allocation (Hallett & Birchall, 1995).

The synergistic or "gestalt" view of collaboration (O'Brien et al., 2009, p. 322) suggests that an interprofessional network may develop the capacity to manage a situation better than the sum of its parts. A critical realist perspective implies that this will only happen if the network enables practitioners to gain a better understanding of causal mechanisms than they could on their own, or provides collective resources that can help nudge outcomes in the right direction. Again, this relies on the kind of "double reflexivity" mooted above. One result might be a greater appreciation that in some cases "less is more," in that one or two strategic interventions may deliver more benefits than a whole raft of individual micro-treatments, particularly when the latter means children having to be "seen" by a multitude of practitioners. In settings such as looked-after-children, for example, it may sometimes be more useful to employ the professional network in a consultative role, to augment a few existing and trusted relationships, rather than bombard the young person with planning meetings and multiple types of support – the latter being another consequence of disaggregating complex needs in an uncritical way. Above all, this points to the continuing significance of individual relationships between practitioners and their clients, which in an interprofessional context can be one of the most valuable resources at hand, as well as a potential source of dissension and anxiety.

CONCLUSION

In this paper, a model of complexity has been developed as a way of exploring how interprofessional networks function in response to complex problems. As with professional work generally, interprofessional collaboration could be seen both as an engine-room for evidence-based intervention and as a reflective space to enable critical reasoning and aid clinical decision-making (Higgs & Jones, 2008). However, it appears at present that its most likely function in complex cases is to promote "routinized coordination" (Webb, 1991), while offering a limited scope for more creative input. If interprofessional networks are to move beyond functional duties, they will need to develop the capacity to observe their own behavior, challenge their own hypotheses and encourage innovative solutions that accept risk as well as manage it. This may be a fruitful area for further research. For rather than trying to establish how collaboration can achieve set outcomes in almost any case, perhaps we should learn from the experience of professionals working together on those cases in which it feels, at times, as if the outcome could be almost anything.

ACKNOWLEDGEMENTS

The author thanks Professor Jan Fook, Professor Ravinder Barn and Professor Ray Jones for their support and comments on an earlier version of this paper.

Declaration of interest

The author reports no conflict of interest. The author alone is responsible for the content and writing of the paper.

REFERENCES

Atkinson, M., Jones, M., & Lamont, E. (2007). *Multi-agency working and its implications for practice: A review of the literature*. Reading: CfBT.

Ayre, P., & Preston-Shoot, M. (Eds.) (2010). *Children's services at the crossroads: A critical evaluation of contemporary policy for practice*. Lyme Regis: Russell House Publishing.

Bhaskar, R. (2008). *A realist theory of science*. London: Verso.

Bhaskar, R. (2009). *Scientific realism and human emancipation*. Abingdon: Routledge.

Bhaskar, R. (1989). *The possibility of naturalism: A philosophical critique of the contemporary human sciences*. Hassocks: Harvester Press.

Brown, K., & White, K. (2006). Exploring the evidence base for integrated children's services. Retrieved from: www.openscotland.gov.uk/publications

Collier, A. (1994). *Critical realism: An introduction to Roy Bhaskar's philosophy*. London: Verso.

Conway, P. (2009). Falling between minds: The effects of unbearable experiences on multi-agency communication in the care system. *Adoption and Fostering*, *33*, 18–29.

Cooper, H., Braye, S., & Geyer, R. (2004). Complexity and interprofessional education. *Learning in Health & Social Care*, *3*(4), 179–189.

Danermark, B., Ekstrom, M., Jacobsen, L., & Karlsson, J.C. (2002). *Explaining society: Critical realism in the social sciences*. Abingdon: Routledge.

Devaney, J., & Spratt, T. (2009). Child abuse as a complex and wicked problem: Reflecting on policy developments in the United Kingdom in working with children and families with multiple problems. *Children and Youth Services Review*, *31*(6), 635–641.

Department for Children Schools and Families (2008). *Building brighter futures: Next steps for the children's workforce*. Nottingham: DCSF.

Department for Children Schools and Families (2010). *Children's trusts: Statutory guidance on cooperation arrangements, including the children's trust board and the children and young people's plan*. London: The Stationary Office.

Department for Education and Skills (2006). *Working together to safeguard children: A guide to inter-agency working to safeguard and promote the welfare of children*. London: The Stationery Office.

Engeström, Y. (2001). Expansive learning at work: Toward an activity theoretical reconceptualization. *Journal of Education & Work*, *14*(1), 133–156.

Ferguson, H. (2010). The understanding systemic caseworker: The (changing) nature and meanings of working with children and families. In P. Ayre, & M. Preston-Shoot (Eds.), *Children's services at the crossroads: A critical evaluation of contemporary policy for practice*. Lyme Regis: Russell House Publishing.

Fawcett, B., Featherstone, B., & Goddard, J. (2004). *Contemporary child care policy and practice*. Basingstoke: Palgrave Macmillan.

Fish, S., Munro, E., & Bairstow, S. (2008). *Working together to safeguard children: Developing a multi-agency systems approach for case reviews*. London: SCIE.

Hallett, C., & Birchall, E. (1995). *Interagency coordination in child protection*. London: HMSO.

Harvey, D.L., & Reed, M. (1996). Social science as the study of complex systems. In D.L. Kiel, & E. Elliot (Eds.), *Chaos theory in the social sciences: Foundations and applications*. Ann Arbor: University of Michigan Press.

Higgs, J., & Jones, M.A. (2008). Clinical decision-making and multiple problem spaces. In J. Higgs, M.A. Jones, S. Loftus, & N. Christensen (Eds.), *Clinical reasoning in the health professions*. Oxford: Butterworth-Heineman.

Irvine, R., Kerridge, I., McPhee, J., & Freeman, S. (2002). Interprofessionalism and ethics: Consensus or clash of cultures? *Journal of Interprofessional Care*, *16*(3), 199–210.

Lash, S. (2000). Risk Culture. In B. Adam, U. Beck & J. Van Loon (Eds.), *The Risk Society and Beyond: Critical Issues for Social Theory*. London, Sage.

Leathard, A. (2003). Models for interprofessional collaboration. In A. Leathard (Ed.), *Interprofessional collaboration: From policy to practice in health and social care*. Hove: Routledge.

Menzies-Lyth, I. (1988). *Containing anxiety in institutions*. London: Free Association Press.

Nybell, L. (2001). Meltdowns and containments. Constructions of children at risk as complex systems. *Childhood*, *8*(2), 213–230.

O'Brien, M., Bachmann, M.O., Jones, N.R., Reading, R., Thoburn, J., Husbands, C., Shreeve, A. & Watson, J. (2009). Do Integrated Children's Services Improve Children's Outcomes?: Evidence From England's Children's Trust Pathfinders. *Children & Society*, *23*(5), 320–335.

Ovretveit, J. (1993). *Coordinating community care: Multidisciplinary teams and care management*. Buckingham: Open University Press.

Parton, N. (2006). Every child matters: The shift to prevention whilst strengthening protection in children's services in England. *Children and Youth Services Review*, *28*(8), 976–992.

Rasmussen, J. (1997). Risk management in a dynamic society: A modelling problem. *Safety Science*, *27*(2), 183–213.

Reder, P., & Duncan, S. (2003). Understanding communication in child protection networks. *Child Abuse Review*, *12*(2), 82–100.

Reeves, S., Goldman, J., Gilbert, J., Tepper, J., Silver, I., Suter, E., & Zwarenstein, M. (2011). A scoping review to improve conceptual clarity of interprofessional interventions. *Journal of Interprofessional Care*, *25*(3), 167–174.

Sackett, D.L., Rosenberg, W.M.C., Gray, J.A.M., Haynes, R.B., & Richardson, W.S. (1996). Evidence based medicine: What it is and what it isn't. *BMJ*, *312*(7023), 71–72.

Sanderson, I. (2006). Complexity, 'practical rationality' and evidence-based policy making. *Policy and Politics*, *34*(1), 115–132.

Sayer, A. (2000). *Realism and social science*. London: Sage.

Sayer, A. (2010). *Method in social science: A Realist Approach*. London: Routledge.

Sloper, P. (2004). Facilitators and barriers for co-ordinated multi-agency services. *Child: Care, Health and Development*, *30*(6), 571–580.

Spratt, T. (2009). Identifying families with multiple problems: Possible responses from child and family social work to current policy developments. *British Journal of Social Work*, *39*, 435–450.

Stevens, I., & Cox, P. (2008). Complexity theory: Developing new understandings of child protection in field settings and in residential child care. *British Journal of Social Work*, *38*(7), 1320–1336.

Stewart, A., Petch, A., & Curtice, L. (2003). Moving towards integrated working in health and social care in Scotland: From maze to matrix. *Journal of Interprofessional Care*, *17*(4), 335–350.

Thelen, E., & Smith, L.B. (1994). *A dynamic systems approach to the development of cognition and action*. Cambridge, MA: MIT Press.

Thrift, N. (1999). The Place of Complexity. *Theory, Culture & Society*, *16*(3), 31–69.

Warmington, P., Daniels, H., Edwards, A., Brown, S., Leadbetter, J., Martin, D., & Middleton, D. (2004). *Interagency collaboration: A review of the literature*. Bath: University of Bath.

Webb, A. (1991). Coordination: A problem in public sector management. *Policy & Politics*, *19*, 229–242.

Woodhouse, D., & Pengelly, P. (1991). *Anxiety and the dynamics of collaboration*. Aberdeen: Aberdeen University Press.

White, S., Hall, C., & Peckover, S. (2009). The descriptive tyranny of the common assessment framework: Technologies of categorization and professional practice in child welfare. *Br J Soc Work*, *39*(7), 1197–1217.