Case Formulation After Engel—The 4P Model: A Philosophical Case Conference

Jonathan W. Bolton

Philosophy, Psychiatry, & Psychology, Volume 21, Number 3, September 2014, pp. 179-189 (Article)

Published by Johns Hopkins University Press
DOI: 10.1353/ppp.2014.0027

For additional information about this article
http://muse.jhu.edu/journals/ppp/summary/v021/21.3.bolton.html
Case Formulation After Engel—The 4P Model: A Philosophical Case Conference

Jonathan W. Bolton

Abstract: The best known model for case formulation in the last 50 years was George Engel’s Biopsychosocial model. It expanded the compass of medical investigation and it promised a scheme by which to organize clinical information for more adequate understanding and more effective interventions. Despite its claimed advantages, it has not been adopted by clinicians. This article examines reasons for this failure. It argues for the therapeutic value of case formulation (as a complement to diagnosis), and presents an alternative schema by which clinicians can organize information into the four moments of a clinical problem: its origins (preconditions), precipitating factors, perpetuating factors, and protective factors. Unlike Engel’s hierarchically organized, synchronic schema, the 4P schema is developmental, diachronic, and clinically intuitive. The 4P schema encourages ‘thick’ case formulations as the basis of wise treatment interventions. The last section describes two seminar series in which the structure and elements of the 4P schema were presented to third-year psychiatry residents.

Keywords: Biopsychosocial model, diagnosis, medical education, illness behavior, sick role, interpretation, practice.

Would this view, if true (and it seems to be), confirm George Engel’s late-life despair about medicine after he had spent so much energy trying to get physicians to broaden their understanding of illness? Ironically, it might have been, at least in part, because of Engel’s efforts that clinicians are now disinclined to try to understand their patients from biological, psychological, and sociological perspectives. In this article, I review Engel’s Biopsychosocial model as a schema for case formulation. I then defend the utility of case formulation in practice and present an alternative model that avoids some of the conceptual and practical problems of the Biopsychosocial model. Finally, I describe the organization of a seminar that was designed to train psychiatric residents how to formulate their cases within this alternative model, which I call the 4P model. Although the seminar was designed for psychiatric residents, the organization and much of the content are applicable to trainees in
other medical disciplines and medical students more generally.

**Engel’s Biopsychosocial Model**

Engel proposed his Biopsychosocial model of disease as a corrective to what he called the Biomedical model. As he described it, the Biomedical model was (or is, as it has not gone away) a fractional-analytic model, typical of ‘classical science’ that seeks to understand disease by breaking it down into its constituent parts and elucidating simple, linear causal sequences. Diseases, including behavioral abnormalities if they are to be considered diseases, should ultimately be reducible to basic biochemical or physical derangements. If a phenomenon cannot be reduced in this way, then it is not a disease, and therefore it is not within the domain of medicine (Engel 1977).

Engel challenged psychiatry to not adopt the Biomedical model, and advised that medicine as a whole should reconsider its attachment to it. By excluding psychological and social influences on behavior and illness, clinicians have a narrow vision of disease. With this argument, Engel was in harmony with some of the moderate voices of the then influential Psychosocial movement. However, Engel went further. He looked for ways to link the biological, the psychological, and the social into a conceptual whole. This was a time of Grand Theories: Structuralism in linguistics and anthropology, Functionalism in sociology, Psychoanalysis, and Marxism. Engel hitched his arguments to the writings of the biologist von Bertalanffy, whose ambitious General Systems Theory called for a ‘reorientation of science’ toward thinking about phenomena as manifestations of transcendental organizational principles (von Bertalanffy 1968). The General Systems Theory is a ‘meta-model’ in that it seeks to identify the ‘universal principles applying to systems in general’ rather than to understand any particular system. von Bertalanffy contrasted closed systems or unorganized complexities, for which classical science might be adequate, and open systems, which include life forms, for which it is not. Understanding open systems or organization involves identifying the structural uniformities, organizational principles, or isomorphisms common to apparently different systems or levels of organization. A foundational organizing principle is hierarchy: “nature is ordered as a hierarchically arranged continuum. . . . Each level in the hierarchy represents an organized dynamic whole…” (Engel 1980, 536). In his 1980 article, Engel sought to illustrate how hierarchically connected levels of organization—from cellular to social—were implicated in the case of a man with chest pain.

**Post Mortem**

For reasons best elucidated by historical research Engel’s model, or at least the term Biopsychosocial, was adopted by medical educators, becoming institutionalized over the last few decades, for example, in the phrasing of competencies, learning objectives, and conferences.

Now, 35 years later, what are we to make of the Biopsychosocial model? It is quite difficult to answer this question, in part because it has become part of the ideology of medicine. Preclinical medical students are still being asked to consider problems from biological, psychological, and sociological perspectives, although without being taught an integrating metaphysics of the sort that Engel and especially von Bertalanffy proposed. If it was such an advance over the Biomedical model, why has it not caught on? Why do we not hear teams of rounding physicians trying to make links between changes at the cellular level with psychological states or social dynamics? There are epistemological and pragmatic reasons that are intrinsic to the model itself, and external reasons for it’s failure to be adopted by clinicians.

Reasons intrinsic to the model include the following. First, the central motif of the Biopsychosocial model is a hierarchy of levels of organization. It is a stratigraphic model, and as the anthropologist Clifford Geertz (1973, 41) wrote of stratigraphic models, “Once culture, psyche, society, and organism have been converted into separate ‘levels,’ complete and autonomous in themselves, it is very hard to bring them back together again.” This is Biopsychosocial model’s Humpty-Dumpty problem. It is difficult or impos-
sible for researchers, let alone clinicians, to be able to trace connections beyond two or three levels (e.g., DNA, protein, structure); it is too much to expect that clinicians be able to make these sorts of cognitive connections for each of the myriad clinical problems that they are asked to respond to.

Second, the inclusion of supra-individual levels of organization within the Biopsychosocial model is necessary for its claim to comprehensiveness; however, it assumes a too happy state of affairs among the disciplines that claim these levels of organization as their own (e.g., sociology, anthropology, political science, economics). These fields are in Kuhn’s term ‘pre-paradigmatic’ (Kuhn 1970). There is little reason to believe that two social scientists will agree on even fundamental concepts within their field. For example, there is no agreed-upon model, e.g., of ‘culture,’ ‘personality,’ or ‘motivation.’ This lack of agreement makes it unlikely that a conceptual model that attempts to link events within their level and with other levels could be described or would be accepted as true.

Third, there is an incommensurability between kinds of knowledge pertinent to different organizational levels. The possession of self-awareness by individuals, and its absence in organs and molecules, makes it difficult to extrapolate from the dynamics of organs to the dynamics of individuals, or groups of individuals.

Fourth, the emphasis in General Systems Theory, on which the Biopsychosocial model is based, is less concerned with how a particular system (e.g., a patient) works and more concerned with how systems of that sort work, that is, what they share with other types of similar systems. This interest in systems as systems is more the concern of researchers who occupy a different social role to clinicians, who must respond to individual patients.

Influences external to the Biopsychosocial model that contributed its failure to be adopted by clinicians include the social organization and a division of labor within medicine that has resulted in greater specialization and, with it, a greater standardization in the definition of problems. This in turn has resulted in a narrowing of the range of phenomena to be made sense of, a containment of uncertainty requiring explanation, and a tendency to reduce the domain of statements made by clinicians to the identification of an entity or a statement that it is not one of the clinician’s claimed entities. All of this has resulted in a reduction in the felt need for such integrative models as the Biopsychosocial model.

Another, more generic reason for its failure might derive from an exaggerated sense of the importance of theory in clinical work. The Biopsychosocial model, even more than the Biomedical model, is a theoretical or rational model. It is arguable that medical practice is actually more empirical than its theoreticians realize (Foster 1994). Much of clinical work proceeds by pattern recognition, lore, and simple axioms. In Peirce’s typology, medical practice is more deductive than inductive, but it is mostly abductive in the sense of generating logically risky hypotheses (Peirce 1992). In psychiatry, the third edition of the Diagnostic and Statistical Manual of Mental Disorders and its descendants encourage a simple empiricism and deductive reasoning. Modern psychiatric diagnosis is explicitly acausal, and as such it is antithetical to Engel’s model. In short, elaborated theories, like the Biopsychosocial model, are not particularly relevant to day-to-day practice, although they do have significant ideological relevance in the medical and political marketplace.

Implications

For all of these reasons, the Biopsychosocial model, as an interpretive or explanatory schema, has not been adopted by the majority of physicians in general or psychiatrists in particular. Instead, we seem to be doing essentially what Engel tried to move us away from doing: we are making diagnoses.

The relationship between diagnosis and case formulation is the relationship between type and case. Diagnosis encourages the clinician to see the person or the person’s problem as a type of problem; formulation encourages the clinician to see the person or problem as something unique, complex, and situated. Diagnosis is a label; formulation is a map. It is a map of the extensions and connections of a problem and a map for action. Case formulation respects Andre Gide’s famous request, “Please don’t understand me too quickly.” Clearly, Engel’s emphasis was on case formulation rather than diagnosis.
The 4P Model of Case Formulation

How do we approach the problem or the patient in its uniqueness? What would a model of case formulation, shorn of high theory but embodying the spirit of the Biopsychosocial model, look like? What would clinicians want it to do?

First, and minimally, it should encourage us to tell better stories, thicker stories.

Second, the model should be true to the process of investigation. The act of giving a diagnosis conveys a sense of finality (not to mention how sticky diagnoses can be once given; Biehl 2005; Rosenhan 1973), but it is actually one moment in an ongoing process, and frequently the diagnosis is either revised or forgotten. As Elvin Semrad observed, “so often, when you get to know a patient, they lose their diagnosis, you know” (Rako and Mazer 1980, 176). A case formulation should be seen as a provisional statement: not right or wrong, but more or less adequate, and in William James’ pragmatic sense more or less true (James 1948).

Formulating a case ought not to be done free form. Clinicians are assisted by at least a minimal framework to guide their examination. As we have seen, Engel’s synchronic, hierarchically organized model has not proven to be useful clinically. What is called for, instead, is a diachronic approach that examines how a problem ‘talks back’ to a prod, prodding again, listening again, and so on (Sch n 1983). It is the iterative process of the hermeneutic circle by which the part is understood with reference to the whole, and the whole is understood by reference to the individual parts.

One model that encourages this perspective is what I call the 4P model. Elements of the model have long been part of a common lore approach (apparently more common to English medicine than American medicine) to case formulation, but the elements are rarely integrated into a framework. The four Ps are preconditions, precipitating factors, perpetuating factors and protective factors. Each of the four Ps poses a question:

- Preconditions: ‘Why is this person vulnerable to this problem?’
- Precipitating factors: Why now? This can refer to ‘why is this person having symptoms now?’ and/or ‘why is this person presenting to this healer for treatment now?’
- Perpetuating factors: ‘Why is this person still ill?’
- Protective factors: ‘Why is this person not more ill?’

These four questions encourage the clinician to see the patient as a case rather than a type by revealing the dramatically different situations of individual patients, and how similar clinical problems affect individuals differently. Together the four questions elicit and organize information into a ‘plot’ for the problem in question.

The four questions elicit ‘actionable’ information: by focusing the clinician’s attention on the relevant biological, social, and psychological perpetuating and protective factors, in particular, the clinician can design comprehensive and effective treatment plans, namely by decreasing the perpetuating and increasing the protective factors. Indeed, supportive psychotherapy attempts to do just that. In this way, the model emphasizes prognosis over diagnosis: the model draws attention to the fixed and modifiable factors that are currently in place that might influence the course of the illness episode.

How Do You Teach the 4P Model?

This last section is based on my experience organizing two, 9-month, weekly seminar series for third-year psychiatry residents—one at the Cambridge Hospital and the other, more recently, at the University of New Mexico.

The course was coordinated by myself; guest lecturers were informed of the structure and pedagogical goals of the seminar series and were asked to try to link their discussion with as many of the other topics as possible. The seminar was intended to complement other disease-, diagnosis-, and treatment-focused seminar series. It was conceived as a foundation course to encourage sophisticated case formulations by introducing residents to bod-
ies of knowledge not fully covered in other courses but which are relevant to the understanding of individual patients’ illnesses.

The organizing principal to the seminar is that the course and prognosis of a disease in any given person is not determined solely by an intrinsic (biological) disease process; the course of illness is importantly affected by sociological and psychological influences that need to be understood and made explicit if interventions are to be appropriate and effective for that person. This approach is at odds with a view of medical practice as only (or even ideally) the application of standardized treatments based on standardized knowledge to standardized problems, but it is consonant with Engel’s view. It is a view of medicine as a practical activity involving (often) unstandardized problems; it calls for practical wisdom, what Aristotle called *phronesis*. According to this view, physicians are not scientists but problem solvers. Jonsen and Toulmin described the difference between scientist and clinician:

> Where scientists study specific cases for any light they can throw on general theoretical ideas, members of the service professions [which include physicians], conversely study general ideas for any help they can give in dealing with specific practical cases. (Jonsen and Toulmin 1990, 31)

This is the justification for exposing physicians-in-training to the general ideas of psychology and sociology: it brings into awareness the diverse influences on illness, and this should lead to more imaginative, intentional and effective therapeutic interventions in particular cases.

The organization of any seminar reveals a number of assumptions about the subject matter (and the audience). The organization of this seminar is intended to acquire knowledge required for the ‘situation analysis’ of the problems presented by any particular person: why the person might be vulnerable to the problem, how and why it arose, and what sustains it and what might help to resolve or ameliorate it. It encourages clinicians to draw on relevant biological, sociological, and psychological knowledge to make fuller sense of these questions.

This seminar is organized into a sequence of four modules mirroring the chronological development of and influences on any clinical problem. The four modules are i) preconditions to illness, ii) precipitating factors in illness episodes (or in health-seeking behavior), iii) perpetuating, and iv) protective factors in illness. The organization of this sequence is important. Research in clinical reasoning shows that *how* knowledge is presented, and organized in memory and which cognitive associations are established influences *how* it is recalled (Bordage 1994). The medium of the seminar series is the message. Appendix 1 provides a syllabus of the course.

The seminar has a number of pedagogical objectives. First, the organization of the seminar itself provides a structure by which to organize clinically relevant information. The organization of the seminar itself contains a built-in redundancy to the pedagogical objective that understanding a patient’s problem(s) means putting it/them into a developmental, biographical, and social context, as well as understanding physiological or anatomical derangements. A related benefit of clustering lectures into the four stages of a problem is that it encourages a broad and cross-disciplinary understanding of phases of the problem. For example, understanding why a person remains ill involves not just understanding the organic progression of a pathological process, but might also involve recognizing the iatrogenic consequences of past medical interventions, the enclosure that occurs with stigmatization of some medical and psychiatric conditions, how the person has become an identified patient within the family system, the ‘functions’ of resisting medical advice, and so on.

Second, the juxtaposition of approaches deriving from different theoretical perspectives encourages a critical understanding of their arguments, especially as they are applied to medical practice (Bolton 1995). This increases the likelihood that our trainees will become discriminating consumers of knowledge. This style of learning is found more commonly in graduate schools than in medical schools or residencies, which continue to emphasize rote memorization over integrative and critical understanding.

Third, the schema introduces topics (e.g., race, poverty, transgenerational influences, immigration, communication patterns, stigma) that are
not commonly included in medical/psychiatric assessment. By integrating these knowledges into an overall schema of sickness, the course demonstrates how they can be influential in vulnerability to and the course of illness. Appendix 2 lists topics according to their contribution to phases of a medical problem.

Fourth, gathering and organizing information according to this model naturally leads to an appreciation of pragmatic and ethical issues pertinent to any particular patient and their problem(s). Sadler and Hulgus (1992) distinguished three aspects of clinical problems: the epistemic aspect, which tries to understand the clinical nature of the problem; the ethical aspect, which considers the preferable course of action, depending on the values of patient and doctor; and the pragmatic aspect, which considers the most practical course of action as influenced by the epistemic and ethical aspects. They pointed out the danger of crossed-aspect decision making in which, for example, a practical aspect is mistaken for an ethical aspect or an epistemic solution is offered for an ethical problem. In exploring the perpetuating and protective factors relevant to a problem, in particular, the clinician inevitably discovers practical and ethical aspects that have to be reckoned with in treatment planning.

Finally, the approach presents a clinician’s-eye view on medical practice. Freidson (1986) distinguished three types of medical work: clinical practice, administrative practice, and research practice. Researchers limit their focus to narrow or abstract problems; administrators consider general problems of organizing services, but clinicians must deal with the often messy problems of individuals. Of the three types of practice, clinical practice is the least theorized, and as a result it is at risk of being ‘trumped’ by the logics of entrepreneurial practice or bureaucratic/rational practice (Freidson 2001). Expanding upon William James’s metaphor of the ‘rich thicket of reality’ (James 1948, 152), Donald Schön (1987, 3) contrasted researchers who stay on the high, hard ground with clinicians who descend into the swampy lowland of confusing problems that defy technical solutions. Schön is among those who recognize the tension between demands for pure, abstract knowledge and the need for practical, reflexive, and contextually sensitive knowledge. Abraham Flexner emphasized the pragmatic nature of medical education and the need for a consciously organized curriculum in the service of case formulation:

Medical education is a technical or professional discipline; it calls for the possession of certain portions among many sciences arranged with a distinct practical purpose in view. That is what makes it a ‘profession’. Its point of view is not that of any one of the sciences as such. It is difficult to see how separate acquisitions in several fields can be organically combined, can be brought to play upon each other, in the realization of a controlling purpose, unless this purpose is consciously present in the selection and manipulation of the material. (Flexner 1910, 58)

As clinicians, we must do our work in the absence of coherent integrated knowledge. Our model for case formulation should be true to the fact that we are more bricoleurs than systems builders (Levi-Strauss 1966). We should not be too worried that the 4P model lacks a reductive model of causation from vulnerability to perpetuation of a problem; for clinicians it is enough to be able to help us tell better, thicker, truer stories to ourselves and to our patients.

References
Appendix I

Case Formulation

A Seminar Series for Third-Year Psychiatry Residents

1. Introduction to Case Formulation Seminar series

2. Are you (just) a disease hunter? The PPPP model of case formulation
   a. Discussion of the difference between diagnosis and case formulation; type and case/token. Examination of alternative models of case formulation.

3. Preconditions: Overview
   a. Genetics
      Primer on genetic contributions to disease, including patterns of inheritance, models of gene-environment interaction, epigenetic influences, role of mutations, methods of investigation (McClellan and King 2010; Rutter and Silberg 2002).

b. Does where you work and how you live hurt you?

c. What are the effects of trauma?
   Discussion of the epidemiology, vulnerabilities, and sequelae of trauma (Herman 1992; MacFarlane 1989).

d. Does social integration help and/or hurt people?
   Discussion of the research into social network analysis; historical shifts in patterns of relatedness; relationship based obligations and expectations; types of relationship-based resources and strain (Berkman and Glass 1989; Seeman 1996).

e. What gets transmitted across generations?
   Does trauma, divorce, parenting styles, guilt, suicide risk get transmitted from generation to generation (Serbin and Karplus 2004; Amato 1996; Kellerman 2001)?

f. Development
   Primer on personality/identity development, including models of adult development (Erikson); sexual identity; research in neurological development (Erikson 1950).

4. Precipitating Factors: Overview
   a. Why do/don’t people seek help?
      Discussion of ‘hierarchies of resort’; types of ambivalence about Biomedicine; impediments to receiving care (Merton et al. 1983; Vogel et al. 2007).

b. What do people want from you?
   Discussion of the research into ‘requests’ that patients make of doctors and how they make them (Lazare et al. 1975; Barry et al. 2000).

c. Contagion
   Examination of the biological and social spread of risk (Bollen and Phillips 1982; Phillips 1974).

d. Can you predict suicide? Can you understand suicide?
   Why do people consider/at tempt suicide when they do? Examination of the ‘motiva-
tion’ behind suicide (Menninger 1938; Buie and Maltsberger 1983).

e. Prodrome and First Break: What does it feel/look like? What can/should you do (Dazzan and Murray 2002)?

f. The ‘motivated accident’:
Discussion of the research into whether some people are some people ‘accident prone’ (Visser et al. 2007; Shapiro 1965).

g. What happens to people when they emigrate/immigrate?
Review of the motivations and forces behind migration; differences between refugees and immigrants; stages of acculturation; influences on identity formation/development; stresses associated with being a migrant (Akhtar 1995; Fadiman 1997).

5. Perpetuating Factors: Overview
a. Hazard accumulation, cumulative injury
How does one condition predispose one to other conditions/stresses (Holland et al. 2000)?

b. Demoralization
What is demoralization, and how is it different from depression (Clarke and Kissane 2002; Frank and Frank 1991)?

c. Why are some people underrated?
Examination of sources of under-treatment—related to patient, provider and social factors.

d. How do we hurt our patients?
Discussion of varieties of iatrogenic effects, including labeling, stigma, ‘side-effects’, medical mistakes, psychological regression, financial costs, etc. (Nath and Marcus 2006; Rosenhan 1973).

e. What is the interaction between pain, personality and suffering?
Does personality style lead to vulnerability or repetitive injury? Are some people ‘prone’ to suffering (Stone 1993; Tyrer 1992)?

f. What’s to gain from suffering?
Examination of notions of primary and secondary gain (van Egmon 2003; Fishbain 1994).

g. Why/how do some people avoid change?
Discussion of role of avoidance in perpetuating illness.

h. Deficits: How does disease affect adaptation?
Examination of how some diseases can interrupt the processes of secondary and tertiary socialization (Carter and Flesher 1995).

i. Interpersonal and family dynamics
Introduction to the research into the influence of family dynamics on illness behavior and experience, including Expressed Emotion, scapegoating, neglect, etc. (Butzlaff and Hooley 1998).

j. Maladaptive coping
Discussion of the variety of coping styles/mechanisms of defense, their adaptive/mal-adaptive consequences, including substance abuse, acting out, avoidance, distortion (Vaillant 1992; Warner et al. 1994; Khantzian 1985).

k. Shame, stigma, guilt
Discussion of the differences between shame and guilt; how they compound illness experiences; interpersonal dynamics involved in stigma and responses available to the stigmatized (Miller 1988).

l. How do people’s thoughts keep them ill?
Introduction to principles of cognitive therapy and positive psychology (Deale 1998).

6. Protective Factors: Overview
a. Why are some people protected from illness?
Introduction to the research into genetic/social advantage and resilience (Rutter 1985; Vanderpol 2000; Frankl 1959).

b. Self-care and intelligence: How do some people stay healthy?
Examination of ‘self-care’ as a form of intelligence and influences on it (Khantzian and Mack 1983).

c. Recovery
Discussion of the patient advocacy, peer support; disability studies; modes of coping (Davidson et al. 2005).

d. Social support
Examination of the role of social capital in health and recovery; patterns of social relationships found in people with different types of illness (Khantzian and Mack 1994; Fowler and Christakis 2008).
e. Does religion protect people from getting ill or dying?
   Review of research on religious beliefs and practices, and spirituality and health/protection from illness (Powell et al. 2003; Vaillant 2008).

f. Role and relevance
   Discussion of the health benefits of 'generativity' and continued social relevance, e.g., volunteering (Yum and Lightfoot 2005).

7. Review and wrap-up

REFERENCES


### Appendix 2

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genetics</td>
<td>Accumulation of vulnerabilities</td>
<td>Relapse and remission</td>
<td>Resilience</td>
</tr>
<tr>
<td>Sex differences in development</td>
<td>Medical illness</td>
<td>Chronic illness</td>
<td>Full treatment</td>
</tr>
<tr>
<td>Neurobiological development</td>
<td>Iatrogenic events</td>
<td>Addiction</td>
<td>Genetic protection</td>
</tr>
<tr>
<td>Prenatal and postnatal exposures</td>
<td>First-break episodes</td>
<td>Pain</td>
<td></td>
</tr>
<tr>
<td>Childhood exposures</td>
<td>Pregnancy</td>
<td>Undertreatment</td>
<td></td>
</tr>
<tr>
<td>Iatrogenic influence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperament (including “neuroticism”)</td>
<td>Life events</td>
<td>Avoidance</td>
<td>Self-care</td>
</tr>
<tr>
<td>Intelligence</td>
<td>Loss</td>
<td>Confidence and despair</td>
<td>Spirituality/religious belief</td>
</tr>
<tr>
<td>Sexuality and gender identity</td>
<td>Trauma</td>
<td>Behaviorist models</td>
<td>Coping styles</td>
</tr>
<tr>
<td>Trauma</td>
<td>Helplessness</td>
<td>Cognitive distortions</td>
<td>Acceptance</td>
</tr>
<tr>
<td>Exposures</td>
<td>‘Stress’</td>
<td>Resistance</td>
<td></td>
</tr>
<tr>
<td>Attachment</td>
<td>‘Accidents’</td>
<td>Primary and secondary gain</td>
<td></td>
</tr>
<tr>
<td>Lack of emotional support</td>
<td></td>
<td>Disability acceptance</td>
<td></td>
</tr>
<tr>
<td>‘Noncompliance’</td>
<td></td>
<td>‘Noncompliance’</td>
<td></td>
</tr>
<tr>
<td>Adaptive pathology and pathological adaptation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interrupted socialization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social networks and illness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural definitions of normal and abnormal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents with illness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political economy of sickness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discrimination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohort variations in incidence of mental illness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social networks and illness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health-related values</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial security</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supportive networks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social ethos regarding suffering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>