

Socio-economic Risk-Analysis

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Editorial: *WISDOM Regained*

This is the first issue of a primarily methodological journal in the social sciences which has been in existence from 1986 up to 1995 under the name of WISDOM and which will continue hopefully for a longer period under the new name of e-WISDOM. e-WISDOM wants to become a forum for comparative research, for the development of new comparative methods and instruments, for social science methodology, and, last not least, for controversies and discussions. Above all, e-WISDOM wants to establish itself as a platform for the proliferation of new methods, models and instruments for comparative research in the social sciences, broadly conceived.

It is planned to produce two to three issues per year which are centered around a new methodological topic. For the first years e-WISDOM will be devoted to

- e-WISDOM 1: Socio-economic Risk-Analysis (2004)
- e-WISDOM 2a: Time-distance Analysis: Method and Application (2004)
- e-WISDOM 2b: Time Distance Analysis: Background Theory (2004)
- e-WISDOM 3: Robust Comparative Methods (2005)
- e-WISDOM 4: Second-order Methods (2005)
- e-WISDOM 5: Symbol-based Methods (2005)

Each issue consists of a set of three to five articles which are devoted entirely to a new methodological issue like socio-economic risk-analysis or time distance analysis.

Contributions and suggestions for further topics outside the five domains mentioned above are highly welcome. It is the stated aim of e-WISDOM to advance the state of social science methods and methodologies as well as to present innovative designs which should enrich the current tools and instruments in comparative research.

Finally, a series of interesting issues and articles from the old WISDOM-journal has been put on the web under www.wisdom.at.

Vienna, June 2004

Karl H. Müller
(Head of WISDOM)

Introduction to Socio-economic Risk-Analysis

Karl H. Müller

Contemporary societies, so a conventional argument goes, are characterized by unprecedented degrees of complexity and diversity. Postmodern lives exhibit features such as discontinuities, breaks, patchwork patterns, uncertainties and risks, to name just a few. Nevertheless, the traditional frameworks for class and stratification analyses have not moved to the new territories of high diversity, high heterogeneity and high complexity.

On the contrary, one of the basic deficiencies in the current discussion on classes and stratifications lies in the clearly underdeveloped conceptual frameworks for measuring inequalities, heterogeneities and disparities under the postmodern condition. Both the core concepts, especially the two major approaches *via* classes (Karl Marx) and *via* status groups (Max Weber) as well as the resulting older or newer frameworks (see e.g., Giddens 1989:209pp.) are by themselves or even in conjunction too weak a foundation for a general stratification perspective in the postmodern age. Basically, three types of arguments can be put forward against the two existing approaches.

- First, with respect to the class approach both in its classical or in its contemporary format advanced by Pierre Bourdieu (1982, 1985) or by Eric Olin Wright (1997), the main counter argument rests basically on too little diversity in the underlying class-concept, including the habitus formation within the configuration of Bourdieu's capital space.
- Second, in relation to a Weberian or Neo-Weberian approach, the main line of argument rests on too little diversity in the horizontal and vertical dimensions of socio-economic stratifications. Here, the space opened up by the vertical and the horizontal dimensions of socio-economic disparities or inequalities is weakly defined at best. On the one hand, a large amount of emphasis is devoted to the vertical dimension only and on the other hand, the index constructions leading to status groups for example are not particularly well developed, utilizing only a small amount of available socio-economic indicators.
- Third, a stringent chain of arguments can be put forward against the relevance, to borrow Erik Olin Wright's term, monogamous explanatory class variables for a promiscuous set of life styles, living conditions or other domains. Let us start with a powerful quotation by Eric Olin

Wright which has the distinctive advantage of being very precise – and very misleading at the same time.

Class analysis is based on the conviction that class is a pervasive social cause and thus it is worth exploring its ramifications for many social phenomena ... Understood in this way, class analysis is what might be called an 'independent variable' specialty. It is a discipline like endocrinology in medicine. If you are an endocrinologist you are allowed to study a vast array of problems – sexuality, personality, growth, disease processes, etc. – in addition to the internal functioning of the endocrine system ... Endocrinology is monogamous in its explanatory variable – the hormone system – but promiscuous in its dependent variables. (Wright 1997:1)

Contrary to Wright it can be demonstrated that class analysis, on purely logical grounds, cannot achieve its desired goal of linking socio-economic classes to the empirically accessible range and diversity of living conditions and attitudes. The main argument can be presented as a *reductio ad absurdum*.

Suppose there is the desired Wrightian reference set of class variables, taken from relations of productions, then this reference set has to be classified as exogenous in a very strong sense, being capable to explain empirical processes of attitude formations or living conditions – and being itself unexplainable by any of these factors. The reference set must act or function as a singular generator and effector for the empirically accessible diversity of life styles, attitudes or class formations.

- The first problem arises from a multiplicity of different domains with different velocities in their adjustment processes and pattern formations. The realm of living conditions, political attitudes or civil practices is characterized by such a high heterogeneity that an "independent variable specialty" is confronted with an insurmountable problem. Against the mere possibility of a singular "independent variable specialty" for explaining everything, the old argument of a missing requisite variety (W. Ross Ashby) can be put forward. The "independent variable specialty" lacks, by necessity, a sufficient amount of requisite variety in order to accommodate for the extremely wide and diversified range of established socio-economic processes and attributes for living conditions or attitude formations.
- A second line of defense might take refuge to a weaker version of class analysis as "independent variable specialty" by qualifying it as largely relevant or of considerable explanatory relevance in most contexts. Even the weaker version of class analysis as a largely relevant "independent variable specialty" must be abandoned immediately since a large number of social domains can be found for which, due to the missing requisite

variety of the "independent variable specialty", no or hardly any tangible effects can be identified. (For empirical examples, see Müller 1998a:228)

- Only in an extremely weak form, the relevance of the reference set can be maintained as "independent variable specialty". Here, one points, like Erik Olin Wright's main argument, to the partial relevance of the reference set of class variables for the shaping of social conditions as well as to the partial irrelevance of the "independent variable specialty". But this weak version has the distinctive disadvantage that a surprisingly large amount of "independent variable specialties" are available, in principle. Take age groups, cohorts, gender, life-styles or regional differentiations to mention just a few, then one can justify their relevance for socio-economic analysis in Wright's own terms.

Age group (cohort, gender, life style, regional) analysis is based on the conviction that age (cohort, gender, life style, region) is a pervasive social cause and thus it is worth exploring its ramifications for many social phenomena.

Thus, the socio-economic endocrine system is itself very promiscuous. And due to a legitimate multiplicity of "independent variable specialties", even the weakest version of a partially relevant singular reference frame must be classified, on purely logical grounds, as impossible to obtain. Moreover, the impossibility verdict is not linked to practical difficulties of data generation or measurement errors. It is the logical consequence of the *reductio ad absurdum*-argument which took its starting point from a singular, class-based "independent variable specialty", capable to explain the entire range of socio-economic processes and attributes and which ended in a necessary multiplicity of available "independent variable specialties" which, however, must be qualified as equivalent or equally relevant for socio-economic analyses, for societal group formations or for stratifications.

It is important to note at this point that the status of each of the available "independent variable specialties" for the description or explanation of current stratification patterns is not particularly well developed either. Surprisingly, the domain of knowledge, despite Daniel Bell's emphatic notion of knowledge as the central unity for organizing group formations in post-industrial societies (Bell 1979a,b), has not become an integral element in any of these "independent variable specialties" so far. Thus, class analysis conceived as endocrinology shares an identical fate with many other socio-economic endocrinologies that an essential element is missing, namely the knowledge domains.

What the first issue of e-WISDOM will offer, then, is a new alternative for stratification research under the postmodern condition. Within the next pages one will be confronted with a new approach that

WISDOM

- is based on the concepts of socio-economic life chances and socio-economic risks
- is highly heterogeneous in order to account for the diversity of contemporary living conditions
- provides a new scale of socio-economic inequality for postmodern lives
- presents new and astonishing links between living conditions and attitudes on the one hand and the status of personal health on the other hand.

It is hoped that the new perspective for socio-economic risk and inequality formation under the postmodern condition is able to open up new cognitive ground for more complex and more refined analyses of contemporary stratification patterns and for more adequate social policies, based on these patterns.

Socio-Economic Risks and Post-industrial Lives. Towards a New Evolutionary Paradigm for Risk-Research

Karl H. Müller

Abstract

The short article will attempt to establish a new conceptual foundation for socio-economic risk-analysis as well as new empirical evidence on the dense binding structures between socio-economic risks, social inequalities and the distribution of health, ailments or sickness in contemporary societies.

- First, as a theoretical risk-assessment, risks or risk-societies (Ulrich Beck) have been confined, especially within the German theory traditions, either to uncertainties and to negative consequences in an accountable decision making process within increasingly complex, risk generating social systems (Niklas Luhmann) or to the impact of advanced technologies and their partially or potentially detrimental effects on living conditions and the environment only (Ulrich Beck). Thus, no broader risk frameworks are at hand which could be further advanced towards a proper integration of socio-economic living conditions and inequalities.
- Second, a new concept of socio-economic risks will be presented and will be accompanied by a new complementary notion, namely by the term of socio-economic life chances. Socio-economic risks and chances will be introduced symmetrically as special attributes of essential living conditions or attitudes. More specifically, dimensions of living conditions like income, life satisfaction, housing conditions, exhibit within each specific population a particular distribution. Thus, significantly below the average values in any of these dimensions of living conditions or attitudes will be classified as socio-economic risks whereas significantly above average values will be categorized as socio-economic chances.
- Third, the multiple dimensions of socio-economic risks and life chances will be aggregated in an unusual way which will allow for the construction of a new vertical scale for social inequalities and disparities, with unspecific risk-accumulations at the lower end of the scale and unspecific life chance accumulations at the upper end.
- Fourth, a special emphasis will be devoted to the linkages between socio-economic risks and life chances on the one hand and evolutionary theory on the other hand. A series of arguments will be developed why the framework for socio-economic risk research should be qualified as evolutionary.
- Fifth, the new platform on socio-economic risk research will provide fresh evidence on much closer linkages between socio-economic living conditions, risks and the state of health. More concretely, the new approach towards risks and inequality will establish a new form of empirical confirmation on the direct impact of unequal socio-economic living conditions on ailments, mental health or sickness.

Despite the emergence of post-industrial lives and contemporary risk-societies, the empirical connections between socio-economic risks, social inequality and the status of health do not exhibit, so it seems, a pattern of mutual disintegration. On the contrary, highly complex and multi-dimensional living arrangements are accompanied by clearly recognizable forms of social inequality and corresponding states of health.

"You're a left-hander driving a car
you're five times likely to die in a crash."
"Than a right-hander."
"Than a right-hander," Richard said,
religiously convinced.
Bud ripped a board out of the floor.
"Not my problem."
"Mine neither."
"I die from stress," Bud said.

Don DeLillo, *Underworld*

A variety of different social science approaches should be readily available which should be able to capture essential aspects and patterns between the two domains of risks and inequality. If, following Ulrich Beck (1986/1989/1993/1997/1998a/ 1998b/2000, Beck/Giddens/Lash 1994) contemporary societies are undergoing a transformation from their modern industrial phase into a stage of risk-societies, then different degrees of socio-economic risks should be the primary source for contemporary forms of societal inequalities as well. In turn, the traditional insights from the previous industrial stage or from the first modernity (Ulrich Beck) on the strong linkages between poverty, inequality and the state of health should be followed up by the emergence of new patterns of socio-economic risk accumulation and inequalities. As often however, seemingly obvious research strategies are, like the Popperian truth, hard to come by.¹ In particular, a quick overview on available risk frameworks of risks reveals that, at least for the present time, this link between risks and inequality has not been undertaken. Briefly put, current sociological perspectives on risks do not lend themselves to include social inequality.

1 The Missing Links between Risk-Frameworks and Inequality

As a theoretical introduction, the broad sociological perspectives on risk and risk formation in contemporary societies rest largely on two different approaches which have been presented within a relatively short period during the late 1980ies, namely on Ulrich Beck's "Risikogesellschaft" (Beck

¹ "Truth is hard to come by" has been the slightly romantic fifth thesis in Popper's "The History of Our Time", printed in Popper (1965:373).

1986) and on Niklas Luhmann's views², culminating in a book on risk five years later (Luhmann 1991).³ Ulrich Beck in his national Post-Chernobyl bestseller uses the pattern of a phase transition between two stages in modernity as a broad platform in which the notion of risks receives its proper attention. The initial stage is characterized, not surprisingly, as industrial or traditional capitalism. Using dialectical metaphors, Beck argues that industrial capitalism has an in-built logic which transcends its own boundaries and identities and which has, thus, an endogeneous drift towards a qualitatively different stage. Thus, driven by inner necessities, industrial capitalism is superseded by a new phase which has been labeled as risk society. Put briefly, risk societies have become the current stage in the capitalist evolution and a generalized logic of risk-production, in contrast to the logic of wealth production of the industrial phase, stands at its center. This new logic of risk production manifests itself most vividly in the effects of high technology production and services which constitute, aside from their undeniable advantages in terms of volume, price, diversity or quality, a permanent threat to individuals or households. Again using dialectical metaphors of inner necessities, production and services under the new risk regime generate, by inner necessity, a large number of pollutants or the potential of very large scale-accidents within very large scale technologies, highlighted by the two major accidents in atomic power plants in Three Mile Island and Chernobyl. Due to the complexities of production and service processes or of the energy and information substructures involved, frequent occurrences of fatal accidents⁴ and high tech-disasters become the order of the risk-day within a risk-society environment.

It would have been fascinating to integrate socio-economic risks into this profile of contemporary risk societies. In fact, Beck devotes the second part of his book on the growing individualization of life courses under the new regime of risk-societies. But despite the phase transition towards risk societies, socio-economic risks have not found their way into the Part II of the book. Rather, for Beck the question of social inequality seems to

² In 1986, Luhmann published a book on ecological communication in which dangers, fears and threats occupy an important position, while the notion of risk, while mentioned at various places, does not figure very prominently within the book. Only with Luhmann 1991 and the 1993 version in English did the systemic approach to risk come into existence.

³ For an interesting historical as well as contemporary summary on the concept of risk, see, aside from the Beck and Luhmann-approaches, Bonß 1995, for special versions see Baecker 1988, Banse/Bechmann 1996 or Japp 2000.

⁴ At various points, Beck seems to suggest, too, that the metamorphosis of modernity I into its self-reflexive stage of modernity II brings about a shift in Charles Perrow's (1984) two dimensional diagram (with coupling and complexity as its vertical and horizontal dimensions) to the quadrant of dense coupling/high complexity.

undergo a transformation itself, namely a secular change from vertical to horizontal forms. At various points, Beck gives the impression that social inequalities belong basically to the domain in which they originated in the first place, namely to the phase of industrial capitalism. Most notably in the phrase “Poverty is hierarchical, smog is democratic” (Beck 1986:51), Beck seems to suggest that vertical societal inequalities become more and more marginalized and de-centered whereas new horizontal ways of inequality like regional, local inequalities or group-specific risks which affect, for example, all employees in a special high-technology plant or even in an entire cluster alike, are gradually occupying the central positions within contemporary risk societies. Thus, combining Beck’s framework with vertical societal inequalities runs the serious risk of running counter to the main structure of his transformation argument for a metamorphosis from old industrial capitalist societies to the new risk societies.

Niklas Luhmann on the other hand stresses the formation of risk production within the context of highly differentiated and highly complex social systems which despite their internal logic of recursively closed operations are confronted with the following problems. Increasingly complex systems within an increasingly complex environment produce, by sheer necessity, an increasing number of societal risks. In order to comprehend the basic line of the argument, it is important to emphasize that Niklas Luhmann distinguishes, on the one hand, risks from dangers and, on the other hand, risks from damages or accidents. To re-iterate one of Luhmann’s examples, risks and dangers are separated by the following differences. Under circumstances of no efficient protection from rain and thunderstorms like umbrellas, wet coats and the like, going out with a group of people and getting considerably wet constitutes a danger and might bring small damages on clothings or threats to the group’s health for which, however, nobody can be held responsible. Having umbrellas and other rain protection devices within one’s decision set however, the decision of going out without these protective devices must be interpreted no longer as a possible danger but as a risk and the person or persons, responsible for organizing a walk without these protective devices can be held responsible for the consequences which came about as the after-effects of taking such a risk. This simple example is sufficient to differentiate between a variety of societal risk-configurations on the one hand and societal dangers/failure settings on the other hand. Table 1 gives an upshot of Luhmann’s distinctions between risks, dangers, damages, failures or accidents.

Table 1 Risks, Dangers and Damages in a Luhmannian Framework

	ACCOUNTABILITY	NON-ACCOUNTABILITY
EX ANTE	Risk	Danger
EX POST	Accountability for Damages or Accidents	Non-Accountability for Damages or Accidents

From Table 1 it becomes clear that risks are associated with future consequences and with the ex ante side of decisions only. Risks on the one hand and dangers or threats on the other hand are separated according to the criterion of accountability or responsibility. Furthermore, damages, failures or accidents are to be considered the ex post effects of decisions involving either a risk potential or an ex ante danger.

Following up the Luhmannian arguments on societal complexifications and differentiations, another important distinction is to be proposed between risk-actions and risk-systems. The latter are to be considered as any organized societal ensemble, ranging from marriages up to very large scale transnational enterprises. Due to the increasing internal as well as external complexities, decisions within large societal risk systems have to be undertaken in view of growing uncertainties and in view of non zero probabilities even for massive failures or large-scale accidents. Thus, contemporary societies produce a large amount of risks, some of which become failures, accidents and damages. Niklas Luhmann goes on to provide a fascinating array of examples which demonstrate various strategies of risk aversion or, above all, risk transfer from the inner side of complex systems into their environment.

Despite several fascinating insights on current processes of risk-transfers and on the over-burdening of private households with accountabilities in areas like bio-technology or medicine, the overall framework is too weak a foundation for being able to incorporate societal inequalities into its research

agenda. One of the main reasons is linked to the ex ante definition of risks, the other one to the dependence on decision configurations and uncertainties. Thus, core domains of socio-economic risks like poor qualifications, hazardous working conditions, pollution of one's housing area and the like cannot enter into the overall compound of risks, risk systems, dangers, uncertainties or accountabilities. The Luhmannian research strategy on societal risks, too, does not lead even near the domains of societal inequalities and disparities.

2 Socio-Economic Risks and Life-Chances Newly Defined

Despite the initial failure of combining existing frameworks on risks with social inequalities, a new approach will be opened up by introducing novel ways for defining socio-economic risks as well as its complementary notion of socio-economic life chances⁵. Moreover, both notions of risks and chances will be defined in a highly encompassing manner for various domains of the socio-economic universe including its technological or infrastructural arenas. Additionally, the concepts of risks and chances will be linked directly to a probability measure, establishing, thus, a well-defined instrument for ex ante analyses as well.

The starting point for the subsequent definitions of risks and chances lies on socio-economic actors or spatial ensembles and on their essential attributes. Actors are in no way restricted to individuals but may include firms, organizations across different spatial levels and even a state-apparatus, a multi-national agency or a transnational NGO. Spatial ensembles include, above all, groups of actors in space like districts, regions, cities, nations or multi-national domains. For reasons of simplicity, the subsequent discussion will focus on actors and not on spatial entities.⁶ For the present purpose, even the focus on actors will be narrowed down to individuals since these were the subjects of the classical approaches to social inequality.⁷ Towards the end of the present section, the risk and chance definitions for individual

⁵ For similar basic ideas, see, aside from the Weberian notion of "life chances", also Anthony Giddens and the "politics of life chances" (Giddens 1997). It should be added though, that the subsequent operationalization and aggregation procedures for societal stratification patterns of "multiple risks" and "multiple (life)chances" will be new attempts to link these "risk" and "chance"-based notions with empirical data. For the notion of "accumulated risks" and German data, see Habich 1994, Habich/Krause 1994, Habich 1996.

⁶ For a detailed analysis of regions with the new approach towards risks and life chances, see Müller/Link 1999.

⁷ It must be emphasized though that the present risk/chance approach can be applied to different sets of actors as well like firms, scientific institutes, state agencies and the like. As an example of a risk-analysis for scientific institutes, see Müller *et al.* 2002.

actors will be generalized to include at least for broad arenas for risk analysis, namely individual actors, organizations, spatial units like cities, regions or nations and, finally, technological systems. In this way, the reference domains for traditional risk analysis of the Beck-Luhmann variety, namely organizations and technology, are preserved. Additionally though, the new risk approach will be able to integrate new domains like living conditions, regions as well as a variety of other fields⁸ into its set of paradigmatic applications.

In contrast to the once dominant focus on labor-capital-relations, the main emphasis here shifts to the overall daily routines of actors which include, quite naturally, their work practices, but which consist of other forms and areas of action and interaction as well. Following strongly established traditions within social psychology⁹, the cognitive sciences¹⁰ or micro-sociology¹¹, actors can be described by two main groups of attributes, namely

- by attributes related to their internal structure (arena I)
- and by characteristics of the contexts or the settings in which actors usually follow their routines and practices (arena II).

Within the traditions of survey research, both domains have found their way into numerous questionnaires and item batteries. Essential dimensions for the first domain include coping capacities, the emotional constitution, life satisfaction, the pre-history of actors or critical life-events. For the contextual domain, important and relevant attributes comprise, *inter alia*, the quality of housing conditions, including the environment of one's home, conditions on the working place, the technical infrastructure at the working place or less tangible areas like social networks, political participation, broadly conceived, etc. Thus, the initial configuration for the subsequent introduction of risks and life-chances is given by a comprehensive set of actor attributes, summarizing, to use a phrase from Ludwig Wittgenstein, an entire form of life.

⁸ It must be emphasized that practically all ensembles or populations within the social world like artistic styles, cultural trends, political parties or religious movements can, in principle, become objects for this new type of risk-analysis.

⁹ For interesting overviews and approaches, see Palombo 1999, Ryckman 2000,

¹⁰ Within the cognitive science arena, one finds meanwhile numerous sub-fields and disciplinary niches covering the entire range of senso-motoric, emotional and cognitive routines as well their still puzzling interplay. For a diverse set of literature, see 1998 Calvin 1996, Calvin/Bickerton 2000, Campbell 1984, Damasio 1994/1999, Deacon 1997, Holland 1995, Hofstadter 1982, Hofstadter/Dennett 1982, Hofstadter 1985/1995/1997, Lakoff/Nunez 2000, Minsky 1990, Norretanders, Pert 1997, Pinker 1997, Plotkin 1997, Pollock 1989, Ratey 2001, Roth 1999 or Sternberg/Wagner 1994.

¹¹ For micro-sociology see, for example, Goffman xx.

The subsequent definitions for socio-economic risks and life-chances will occupy some of the semantic terrains only which are currently covered by these two highly heterogeneous concepts. According to standard dictionaries, risks and chances range over wide fields from gambling and decision theory to the realm of failures or favors. Following one of the Webster's definitions, the term "chance" is to be understood here in terms of an "opportunity", "a slight possibility of a favorable outcome" (Webster's 1993:162) or "the more likely of possible outcomes" (Ibid.) whereas the risk concept is linked, again following Webster's, rather generally to the "possibility to loss or injury" (Webster's 1993:881)¹².

Generalizing this specific aspect of risks and chances for the domain of essential actor attributes, risks will be linked to severe restrictions, losses, barriers, injuries in the action and interaction potential of actors and with unfavorable conditions in their overall contexts whereas chances or life chances are to be understood in terms of easy access, high participation, no barriers and of significantly high action or interaction potentials within highly favorable societal settings or contexts. In both instances, the concepts of socio-economic chances and risks are to be utilized along the entire time axis, i.e., for risk-chance-analyses in the past, the present and the future.

To be more specific, an assessment in terms of socio-economic risks or life chances can be undertaken for any socio-economic dimension if and only if four conditions are met simultaneously:

- First, the socio-economic dimensions under consideration must constitute essential characteristics of actors and their overall routines within their everyday contexts.
- Second, these essential socio-economic traits must be interpretable in a vertical fashion so that significantly below average or distinctively above average values correspond, quite generally, to the semantic regions of favorable (socio-economic life chance) and unfavorable (risk socio-economic risk) living conditions.
- Third, more specifically, below average (risk) values must be closely associated with internal integration problems of actors or to contextual restrictions, limitations, barriers or detrimental shocks.
- Fourth, likewise, above average (life chance) values have to be connected with successful integration operations of actors or with contextual conditions of easy access, high resources, low or no barriers, no or marginal restrictions or no detrimental shocks.

¹² In Webster's, one finds, additionally, risk as "the chance(!!!) of loss or perils to a person or thing" which, however, would be too misleading to be included in the beginning. (Webster's 1993:881)

Since risks and chances have been separated according to significantly below or above averages, an intermediate area around the average opens itself up quite naturally (insignificantly below or insignificantly above average) which for obvious reasons will be qualified as indifference region between risk and chance.¹³ Tables 2 and 3 offer some basic characteristics for different risk-, indifference- and chance areas (Table 2) as well as several essential socio-economic dimensions and their corresponding values for risk or chance positions (Table 3).

At this point, it might be useful to differentiate between the risk-chance dimension and the luck/bad luck (misfortune) dimension, offered by Nicholas Rescher. (Rescher 1997) In Rescher's case, luck and bad luck (misfortune) are positive and negative evaluations based on random events, unpredictable and unknowable for the actors in question, whereas the risk-chance dimension, developed here, is based on an evaluation of any socio-economic attribute or process which are partly known to network actors and partly of an unforeseeable character only.

Thus, traffic noise may be a constant disturbance to the household area of a specific network actor whereas the sudden death of a family member falls under the random category. Additionally, both dimensions are entangled in a variety of "strange loops" (Douglas R. Hofstadter), where "bad luck" in a socio-economic situation, e.g. a traffic accident, may lead to injuries and bad health conditions which seriously hamper and restrict the day to day routines and give rise to new social risks like reduced social contacts. These newly acquired risks, in turn, bring about new socio-economic random configurations in which "bad luck" or "good luck" can operate again.

Consequently, the concepts of socio-economic risks and chances can be defined in the following manner.

¹³ Once again it must be emphasized that the new semantic domains for risk and chances are not confined to individuals only but can be extended to different actors across various levels like enterprises or state organizations or to spatial ensembles like regions, cities or nations and even to seemingly remote areas like computer programs, low, medium and high technologies or even to scientific articles and books whose essential attributes can be assessed in terms of their risk/chance profiles, too.

Table 2 Main Characteristics of Socio-Economic Risks and Chances for Individual Actors

	SOCIO-ECONOMIC DOMAINS OF	
	RISK	CHANCE
ARENA I (Inside Actors)	High Internal Adjustment Problems Low Degree of Self-Confidence or Self-Esteem Large Difficulties for Coping and Integration Many Shocks and Disturbances in the Past	Low Internal Adjustment Problems High Degree of Self Confidence or Self Esteem Small Difficulties for Coping and Integration Few Shocks and Disturbances in the Past
ARENA II (Contexts)	High Barriers, High Restrictions Low Access Few Linkages to the Environment of Actors High Degree of Disturbances and "Shocks" in Living Areas Few Linkages- from Outside	Low Barriers Low Restrictions High Access Many Linkages to the Environment of Actors Low Degree of Disturbances and "Shocks" in Living Areas Many Linkages from Outside

Table 3 Selected Dimensions for Socio-Economic Risks and Chances

Dimensions	Risk	Indifference	Chance
Income	Low	Medium	High
Qualifications	Low	Medium	High
Job Security	Low	Medium	High
Work-Stress	High	Medium	Low
Stress from Household Work	High	Medium	Low
Social Contacts	Low	Medium	High

- An actor A from a given population P is in a position of socio-economic risk iff one can assign (a) a comparatively high value for internal integration problems or a comparatively low value for internal adaptation capacities (Arena I) as well as (b) a comparatively high value for barriers, restrictions or outside disturbances for the interaction potential and a comparatively low value for actual action and interaction routines (Arena II) where the term “comparatively” has to be specified with respect to the overall distribution $\Lambda(P)$ and to a significantly below average position of A within $\Lambda(P)$.
- An actor A from a given population P is in a position of socio-economic indifference iff one can assign (a) a comparatively medium value for internal integration problems or a comparatively medium value for internal adaptation capacities (Arena I) as well as (b) a comparatively medium value for barriers, restrictions or outside disturbances for the interaction potential and a comparatively medium value for actual action and interaction routines (Arena II) where the term “comparatively” has to be specified with respect to the overall distribution $\Lambda(P)$ and to an average position of A within $\Lambda(P)$.
- An actor A from a given population P is in a position of high socio-economic life chances iff one can assign (a) a comparatively low value for internal integration problems and a comparatively high value for internal adaptation capacities (Arena I) as well as (b) a comparatively low value for barriers, restrictions or outside disturbances for the interaction potential and a comparatively high value for actual action and interaction routines (Arena II) where the term “comparatively” has to be specified with respect to the overall distribution $\Lambda(P)$ and to a significantly above average position of A within $\Lambda(P)$.

Socio-economic risks and life chances, understood in the sense of significantly different degrees of barriers, disturbances or significant losses or gains with respect to the intra- and interaction potential of actors, have at least three distinctive advantage since these definitions can be utilized for other actors like small, medium or large-scale organizations¹⁴, for spatial

¹⁴ Basically, the same definition which has been proposed for individual actors can be used for defining risks and chances, or alternatively, opportunities for different types of organizations as well. (For a concrete example of an organizational risk-analysis, see Müller et al. 2002)

ensembles like cities, regions or nations¹⁵ or for small, medium and large-scale technological systems. Finally, the new risk and chance-based framework operates along the entire time-axis and is applicable for ex ante investigations as well.¹⁶

More formally, the cardinal probability concept can be based on the empirically available ex post evidence and can be obtained as a transformation from empirical distributions and transitions to probability distributions and probability transitions. More concretely, the empirical evidence from the past that 80% of the population within a specific multiple risk group MRG of a given population P has two or less rooms can be transformed into an ex ante probability statement, stating that for a member of a specific multiple risk group in the population P the ex ante probability of having two or less rooms is 0.8.

For transition probabilities a similar procedure can be applied. Assuming for example that the empirical transition rate of moving from a high risk-position into at least an intermediate position within a period of five years is

¹⁵ In the same manner, spatial units like a district in a city, a sub-national region or a nation can become the primary objects of this new risk-approach since the basic definitions for socio-economic risks and life chances for individual actors can be applied to spatial entities as well. It is legitimate to define a spatial unit like a city district at risk iff one can assign (a) a comparatively high value for internal integration problems or a comparatively low value for internal adaptation capacities (Arena I) as well as (b) a comparatively high value for barriers, restrictions or outside disturbances for the interaction potential and a comparatively low value for actual action and interaction routines (Arena II) where the term “comparatively” has to be specified with respect to the overall distribution $\Lambda(P)$ and to a significantly below average position of A within $\Lambda(P)$.

¹⁶ The general definitions for probabilities on risks and chances can be introduced in the following way.

- An actor A from a population P is in a position of socio-economic risk ex ante iff one can assign (a) a high probability for internal integration problems and a low probability for internal adaptation capacities (domain I) as well as (b) a high probability for barriers, restrictions or outside disturbances and a low probability for low actual action and interaction routines (domain II) in the future.
- An actor A from a population P is in a position of socio-economic indifference ex ante iff one can assign a medium probability (a) for internal integration problems or for internal adaptation capacities (domain I) as well as (b) for barriers, restrictions or outside disturbances and for actual action and interaction routines (domain II) in the future.
- An actor A from a population P is in a position of high socio-economic life chances ex ante iff one can assign a low probability (a) for internal integration problems and a high probability for internal adaptation capacities (domain I) as well as (b) a low probability for barriers, restrictions or outside disturbances and a high probability for actual action and interaction routines (domain II) in the future.

10%, then the probability *ex ante* of moving from a high risk sector upward to the intermediate domain within the next five years can be specified as $p = 0.1$. With the help of these two highly simplified examples¹⁷ a wide road for an *ex post* as well as an *ex ante* risk analysis has been opened up. Socio-economic risks and life chances have entered as significant barriers or facilitators for actors and their routines in the past or within the present contexts and determine, such, the actual probability values for the intra- and interaction potential of actors in the future.

To sum up, contrary to Ulrich Beck, socio-economic risks are no longer exclusively or even largely dependent on the high technology infrastructures in the energy, production or in the information sector of contemporary societies or on a particular new production logic within a different, second or other stage of modernity.¹⁸ And contrary to the systemic risk tradition by Niklas Luhmann, socio-economic risks are no longer confined to larger risk systems and their uncertain decision configurations only which could result in detrimental or non-intended consequences.

While the new semantic domains for socio-economic risks and life chance are applicable to the core-domains of the Beck-Luhmann approaches, socio-economic risk-investigations can be extended to many different areas as well which, so far, have not been captured by the two main sociological risk perspectives.

3 PATHS – a Five Step Method toward a New Vertical Scale on Socio-Economic Risks, Life Chances and Social Inequalities

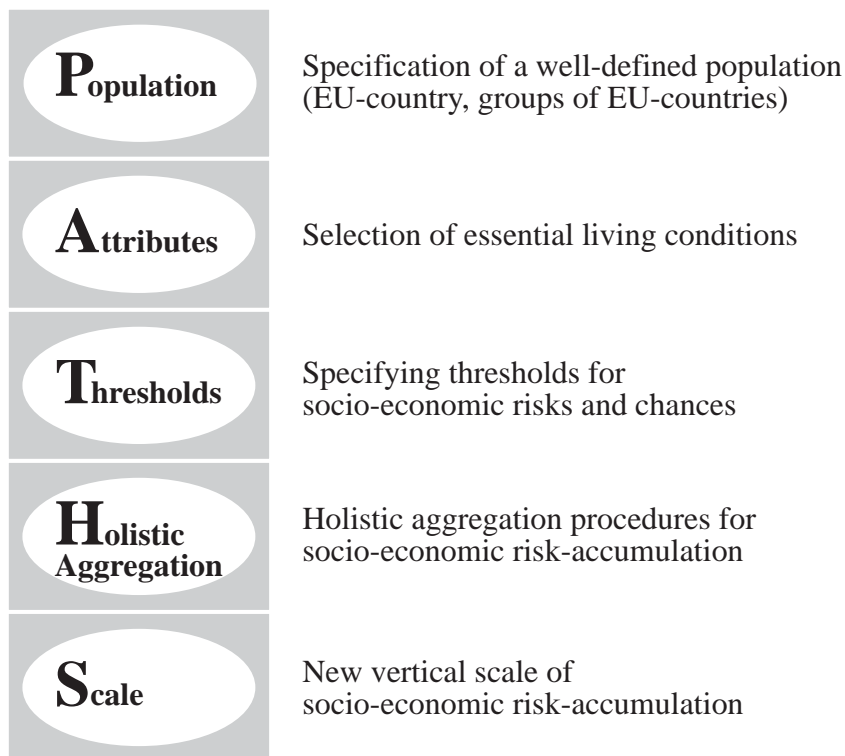
From the new semantic territories of socio-economic risks and life chances, a slightly unconventional operationalization-strategy will lead to a new type of vertical scale which will serve as a risk and chance-based measure for social inequality.. This new path towards integrating socio-economic risks with inequality can be presented in a highly ordered manner, as exhibited by Figure 1, namely as a five step research path along a PATHS-line. Once again, the focus of the subsequent operationalization will be individual actors although the same PATHS-sequence has to be followed in the case of organizations or spatial ensembles as well.

¹⁷ The linkages between past evidence and predictions are not as direct and obvious as these two simple examples suggest. Aside from philosophical considerations along the lines of Hume's and Goodman's paradoxes, statistical theory offers a wide array on techniques, ranging from Bayesian statistics to

¹⁸ For a series of examples on technological systems and the new communication and information technologies, see Müller/Purgathofer/Vymazil 1999.

The first step, according to the PATHS-Figure above, lies in the specification of a well-defined population. Essentially, the term population in Figure 1 is to be understood in a very general way since it refers to the entire spectrum of levels and actors and may comprise a population of individuals in a city, a region, a nation, a multi-national area or across the entire world, a population of organizations¹⁹ across levels or even populations of socio-technical systems like a group of computer programs, of automobiles, of communication and information technologies and the like. Since the main focus in this paper is centered on individual actors and social inequality however, the first step requires a well-defined population of individuals, be it at the local, regional, national, supra-national or at the global level.

Figure 1 Five Steps towards a New Scale for Societal Inequalities



¹⁹ Populations have become one of the main core domains in organizational research, as expressed, for example, in Carroll/Hannan 2000.

The second step is essential for the PATHS-design since it requires the specification of broad domains of living conditions and, thus, a multi-dimensional picture of post-industrial lives.²⁰ The important point here lies in the integration of a diversified and heterogeneous set of dimensions in which classical actor attributes like occupation, qualifications and income or objective living conditions like living space or household equipments are accompanied by a variety of seemingly soft dimensions like life satisfaction, coping capabilities, emotions, critical life events and the like. The main justifications for this move towards heterogenization lie in the subsequent four points.

- First, one can point to the well-documented result from many social surveys, indicating the at times surprising independence between subjective evaluations and emotional feelings on the one hand and the so-called "objective" realm of living conditions on the other hand. (Zapf 1984, 1994)
- Second, one may point to an increasingly common "anti-Cartesian mobilization" (Damasio 1994/1999)²¹ with respect to the status of the "Cartesian Theatre" (Dennett 1991) and to the age-long split between a dual realm of mental or spiritual matters on the one hand and physical objects or processes on the other hand. More and more it becomes clear that both worlds have to be integrated within a unified, though highly complex platform, placing subjective assessments, emotions or attitudes on an equal basis with objective measurements on living spaces, monetary transfers and the like.²²

²⁰ Especially at this point, Anton Amann's verdict on the "degenerate status" of social indicator research should be taken into account as "zero-hypothesis". "I am today convinced that the theoretical potential of the research on social indicators - which was also at the beginning of this movement - has been completely exhausted." (Amann 1996:219)

²¹ Under the unifying slogan of Daniel C. Dennett's "We are almost all naturalists today". (Dennett 1986a:IX) the necessary "Anti-Cartesian mobilization" has to be undertaken in the seemingly remote fields of survey research as well where over the years and decades a large number of "Cartesian" dichotomies have been established and where the separation between objective and subjective measurements or between physical and psychological attributes has been firmly established.

²² On the surprisingly vital scenery and plays within the Non-Cartesian Theatre or, alternatively, within the "Living Globe Theatre", see the subsequent random selection of books which, all in all, may be considered as variations on the single thema of the Great Chain of Becoming which encompasses the domains of nature and society and which, moreover, can be described, studied and analyzed in terms of self-similar co-evolutionary principles. This list of recent publications reflecting the co-evolution between nature and society includes Burnham/Phelan 2000, Changeux/Riceour 2000, Gaarder 2000, Gleick 2000, Kauffman 2000, Michod 1999, Pert 1997, Ridley 2000 or Weiner 1999.

- Third, the inclusion of many different dimensions reflects, moreover, postmodern living conditions which according to standard accounts are characterized by growing heterogenization, disparity and a “neue Unübersichtlichkeit” (Jürgen Habermas) in terms of life style formations. Thus, the construction of a diversified set of dimensions should be able to capture this growing heterogeneity or offer, alternatively, a highly interesting empirical instance to refute this meanwhile common assumption of individualization. (See, once again, Beck 1986, Beck/Beck-Gernsheim 1994, Beck/Sopp 1997)
- Fourth, the importance of including subjective assessments, feelings or areas like the subjective life satisfaction can be justified also with respect to the recent wave of constructivist approaches which stress the importance of self-constructions for the shapes and structures of realities, social and otherwise. Consequently, the subjective perceptions and assessments play a non-trivial role which has to be properly recognized in the selection of essential attributes for individual actors.

In Figure 2, a typical post-modern configuration with many different dimensions has been built up within the context of a large social survey in Austria.²³ Three points in the construction of the dimensional scheme, underlying Table 2, are worth mentioning.

- First, the various dimensions for actors and their contexts should be constructed in a symmetrical fashion. In particular, the same overall number of dimensions should be reserved for the within organization of actors and for their contexts of action. In Table 2 for example, this symmetry condition has been fulfilled, since actors and contexts have been separated into three groups respectively and each of these groups has been supplemented with four different dimensions.
- Second, actors can be characterized in numerous ways and partitionings. Thus, the subsequent main domains are to be understood as one among many potential descriptions and categorizations. Turning more specifically to the Austrian Social Survey, actors have been characterized at any point in time t by an internal cognitive-emotional architecture, by a prehistory from periods $\leq t$ and, finally, by the interaction potential with their environments or settings where the interaction potential is dependent to a significant

²³ For the subsequent explorations, the Austrian Social Survey will be used as a source for appropriate indicators since this representative survey ($N = 2000$), conducted twice in 1986 and 1993, entails a comparatively large number of living conditions and attitude formations. (See also Haller *et al.* 1996).

degree on the accumulated socio-economic resources. With respect to the contextual side, the action space has been divided into three principal contexts or settings as well. Since the separation between work and household belongs to the core-revolution within modern enterprise-based capitalism, the three main settings qualify as household, work-place and, as a typical residual category, as civil arena, comprising all routines or habits which cannot be linked to work or house-hold activities.²⁴ From a methodological point of view, it must be emphasized however, that these specifications are largely dependent on the available set of survey-variables. Different surveys will generate, by and large, different fields for the internal organization of actors and for their contexts. And finally, for any survey data set, various ways are open, in principle, for identifying key characteristics of actors.

- Third, for each of these 2 x 3 broad domains or dimensional groups of the actor scheme, depicted in Figure 2, four indicators have been selected for each of these six areas. Once again, the number of socio-economic dimensions selected depends largely on the available survey data as well as on the specific requirements and conditions for applying risk-chance evaluations. Consequently, a considerably richer survey data base might contain five or even six dimensions. Methodologically, no pre-fixed restrictions can and should be made in advance with respect to the exact number of dimensions. The only methodological requirement lies in the demand for largely independent socio-economic dimensions. Thus, dimensions with high and very high correlations within a specific group have to be avoided since this would create implicitly uneven weights between the dimensional groups selected.
- Fourth, due to the under-determinacy of finding a particular actor description, it is highly advisable to test various configurations for dimensional groups and specific dimensions and to choose a particular combination on the basis of its comparative advantages, using mostly conceptual criteria like a wide distribution across actor features and actor contexts, the adequacy of the risk-chance thresholds or the symmetry condition between actors and their environments but also empirical criteria like the correlations between the socio-economic dimensions within each dimensional group.

²⁴ It should be added that the choice of the term “civil” has been motivated by the current interest in the shape and in the dynamics of civil societies and their role for overall societal development.

For the second step of the overall PATHS-strategy, a comprehensive multi-dimensional and symmetrical array must be constructed which captures essential aspects of the internal side of actors as well as of their day to day routines within their specific contexts or settings.

In Step Three, the essential threshold-step according to Figure 1, the concrete specification and, thus, the integration of socio-economic risks and life-chances into a broad framework of multi-dimensional living conditions is to be accomplished. Here, the specification tasks lies in the definition of critical threshold values. Looking on Figure 2 and thinking of dimensions like income, qualifications, the frequency of unemployment episodes but also on social networks or the quality of the housing environment, it is intuitively appealing to restrict socio-economic risks to a small lower range (5 – 10%) within each of these dimensions and life chances to a narrow upper range (5 – 10%). However, Figure 2 points to the fact that a considerably broader range has been selected. Basically, three main groups of justifications can be provided for this specification move.

- First, a restriction to the small segments within the lowest and highest range generates a large number of unintended consequences for the study of socio-economic risk and chance. To mention only two major consequences, all subsequent analyses would have to be based on a comparison of extremal groups only which cover only ten to twenty percent of the entire population and additional investigations beyond risk and chance would be required for the rest of the population which comprises an overwhelming majority of eighty to ninety percent of the population.
- Second, small segments of socio-economic risks and chances would inhibit to a significant extent the study of risk-accumulation or the combination of two or more socio-economic risks. Since it is highly unlikely that five percent of the population accumulate all forms of socio-economic risks or life chances, groups with multiple risks or multiple life chances would move significantly below the five or ten percent range.
- Third, the notion of risk-societies as a pervasive phenomenon of the contemporary state of societal evolution requires, so it seems, a broader range for socio-economic risks, too. Although a weak argument in itself, it adds up to the overall research direction of specifying considerably wider margins and ranges for socio-economic risks or life-chances.

Figure 2 Central Features for Actors and Their Living Conditions

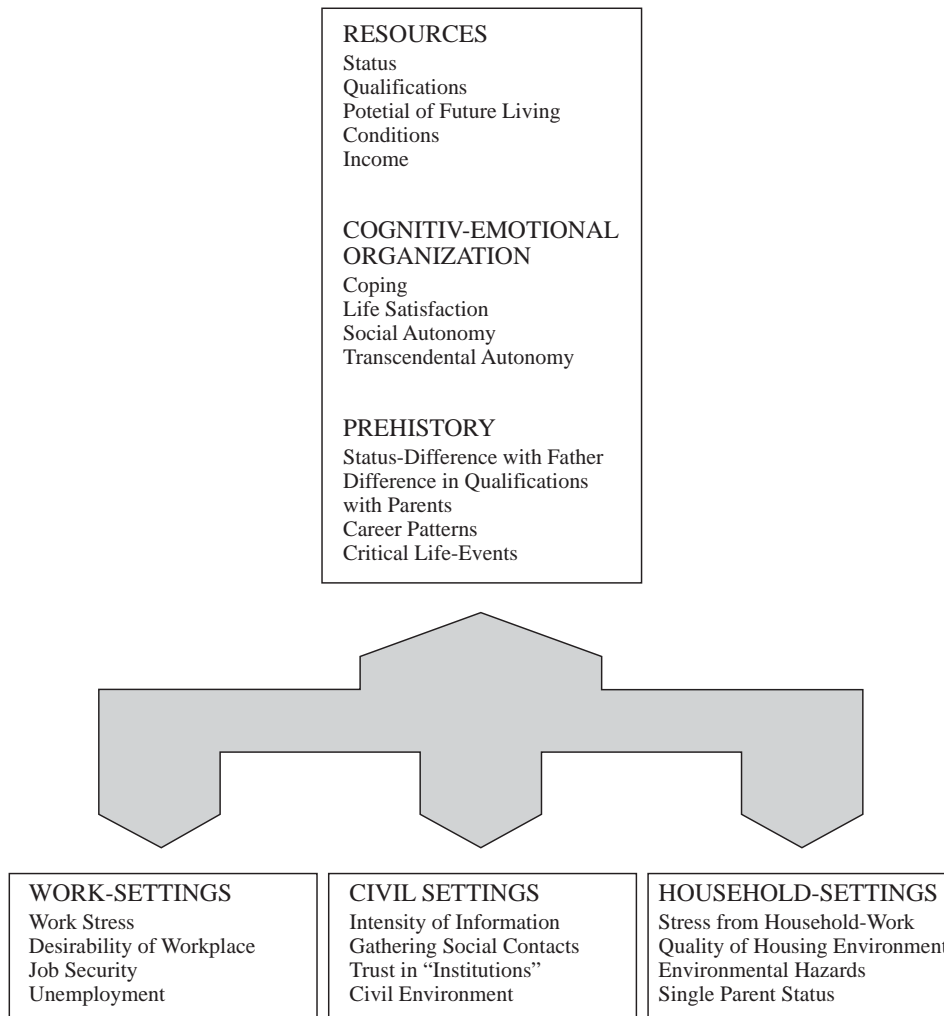


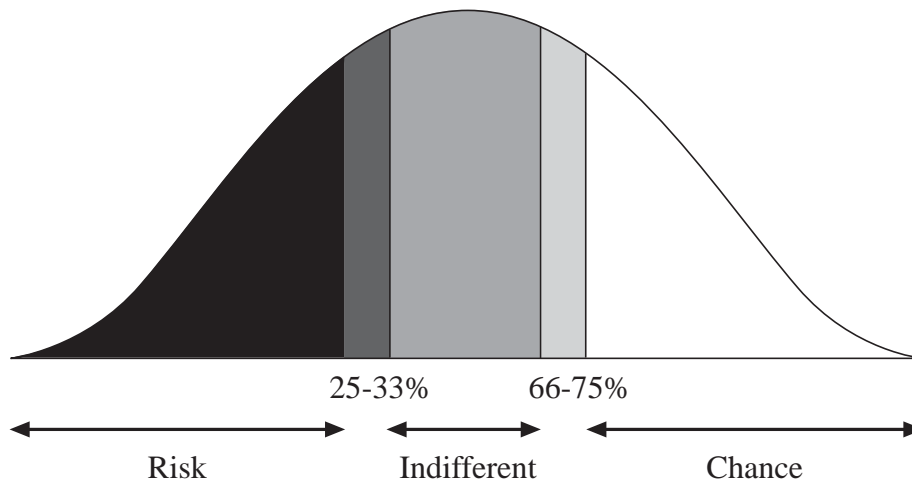
Table 4 Twenty-four Dimensions for Socio-Economic Risks and Chances in the Austrian Social Survey

DIMENSIONS	RISK	INDIFFERENCE	CHANCE
Status	Low	Medium	High
Qualifications	Low	Medium	High
Future Potential	Low	Medium	High
Income	Low	Medium	High
Coping	Low	Medium	High
Life satisfaction	Low	Medium	High
Social Autonomy	Low	Medium	High
Transcendental Autonomy	Low	Medium	High
Status Difference with Father	High	Medium	Low
Difference in Qualifications with Parents	High	Medium	Low
Career Patterns	Downward	Medium	Upward
Critical Life Events	Many	Medium	Few/None
Work Stress	High	Medium	Low
Desirability of Work Place	Low	Medium	High
Job Security	Low	Medium	High
Unemployment	Frequent	Medium	None
Information	Low	Medium	High
Social Contacts	Low	Medium	High
Trust in Institutions	Low	Medium	High
Civil Environment	Low	Medium	High
Stress from Household Work	High	Medium	Low
Housing Environment	Low	Medium	High
Environmental Hazards	High	Medium	Low
Single Parent Status	Yes		No

Consequently, given an indicator like personal income, the lowest quarter up to the lowest third of the distribution should be qualified as a position of socio-economic risk, the domain from 25 (33.3%) – (66.7%) 75% as “indifference position” and the upper quarter (third) as a position of socio-economic chance. In this way, an entire population gets separated, following Figure 3, into three broad groups where the socio-economic risk group comprises the lower segment (25 to 33% of a given population P), the group of socio-economic life chances is composed of the highest sector (25 to 33% of P) and the indifference group lies within an intermediate range, comprising 33 to 50% of a given population P.

To complete the PATHS-task within the third step, all indicators, selected in step two, have to be given appropriate boundaries and thresholds for socio-economic risks and life chances. Thus, the indicators for education, housing conditions, working conditions, on the civil environment (e.g., social networks) on coping abilities or on life-satisfaction must be transformed into a distribution dependent risk- indifference- and chance-structure as well, specifying the thresholds for risks and chances in an entirely distribution-dependent manner within the range of 25 to 33%, as depicted in Diagram 3.

Figure 3 Specification for Socio-economic Risks and Chances



With the third step, both the sought-for inclusion of risks and life-chances as well as the necessary specification and operationalization of critical threshold-values for risks and chances have been fulfilled.

(4) The fourth step in the PATHS-specification goes a new way in the construction of a single vertical scale from a multi-dimensional array of living conditions and attitudes. Here, the aggregation algorithm will take its starting point by a grand departure from the conventional wisdom of combining a multiplicity of dimensions through index constructions where a small or large number of indicators is standardized, appropriately weighted and calculated, finally, as weighted average over the indicator class. On the contrary, the subsequent holistic aggregation will make use of some insights by one of the most interesting and visionary Austrian social scientists during the interwar-period, namely of Otto Neurath and of his basic lines of arguments with respect to the delicacies of multi-dimensional comparisons, measurement problems and index constructions. Initially, Neurath points to severe limitations with respect to inter-personal comparisons.

Given a society of two persons, A and B. Let us symbolize the state of happiness of A who enjoys 'a' by '(Aa)' and of B who enjoys 'b' by '(Bb)' ... We are not starting with an assumption of how human beings behave (how a so-called 'homo oeconomicus' or his substitute behaves) but in what way the results of various kinds of social behavior are connected with different states of happiness. Let us assume that $(Ab) < (Aa)$ and $(Bb) < (Ba)$; then we cannot say how the sums behave: $(Aa) + (Bb) ? (Ab) + (Ba)$... We cannot give any answers if $(Ab) < (Aa) < (Bb) < (Ba)$." (Neurath 1970:36)

In conjunction with Neurath's arguments against the possibility of context-free comparisons, one can detect another powerful line of reasoning which to some extent should be able to compensate for the insufficiencies and limitations of measurements and index constructions. Already in 1910, in his "Theory of the Social Sciences" (reprinted in Neurath 1981), Neurath develops an alternative which is based on a holistic comparison of the total number of socio-economic measurements and rankings. Here, two nations or regions have to be compared by taking into account their total system of production, distribution, their natural resources, social practices, etc. (Neurath 1981:39) And until 1944, to the publication of Neurath's "Foundations of the Social Sciences", this holistic line of argument remains unchanged.

Social scientists may characterize 'living conditions' by telling of shelter, food, entertainment, friendship, 'oceanic feeling', or whatever one thinks of importance. Some of these items may be measured in their own units ..., but in other cases we get only the degrees of certain items which all together constitute what we may call

a ‘silhouette’ of living conditions. We may sometimes speak of ‘higher’ and ‘lower’ levels of living conditions. Then we may speak, too, of the ‘relief’ of happiness. (Neurath 1970:37)

Consequently, a new and holistic way for a multi-dimensional aggregation is needed which is based largely on the holistic intuition, advocated especially by Otto Neurath. In particular, the new aggregation procedure should meet the following three conditions.²⁵

- (C₁) First, the aggregation procedure must be able to include a multiplicity of socio-economic dimensions. This variety of socio-economic dimensions must be diversified enough to account for the relevant day to day routines of contemporary actors or, alternatively, for the diversity of post-industrial or, alternatively, of postmodern lives. (Condition of requisite variety)
- (C₂) Second, the aggregation procedures leading from a set of multiple dimensions to a measure of social inequality should be undertaken on the basis of a holistic aggregation procedure and not by a conventional index construction. (Condition of holistic aggregation)

Following Neurath’s early insights in the necessity for holistic or overall comparisons, the fourth step will develop such an aggregation procedure. In essence, two separate steps must be undertaken on the way to this new way of holistic aggregations.

- First, a radically postmodern strategy has been utilized since all the dimensions which have been included in the set of heterogeneous living conditions are assumed to be of equal weight. This heroic and obviously postmodern assumption of an equal weight condition reflects, *inter alia*, a growing literature on changing life-course plans towards more complex and multi-dimensional targets, including goals outside the area of labor. This multi-faceted picture is reflected in the symmetrical construction inherent in the indicator scheme of Table 2. Settings and actors, setting domains and actor domains, dimensions and indicators within a setting domain and dimensions and indicators within an actor domain have been constructed in a symmetric fashion, placing, implicitly, equal weights to actors and settings, equal weights to each of the actor (resources, prehistory, cognitive-emotional organization) or setting domains (work, housing, civil) and, finally, to each of the dimensions which have been selected for these actor or

²⁵ For the current discussion on exclusion, inequality and poverty, see e.g., Bradshaw *et al.* 1998, Levitas 1998, Nolan/Whelan 1996, Room 1995, Silver 1994, Townsend 1979.

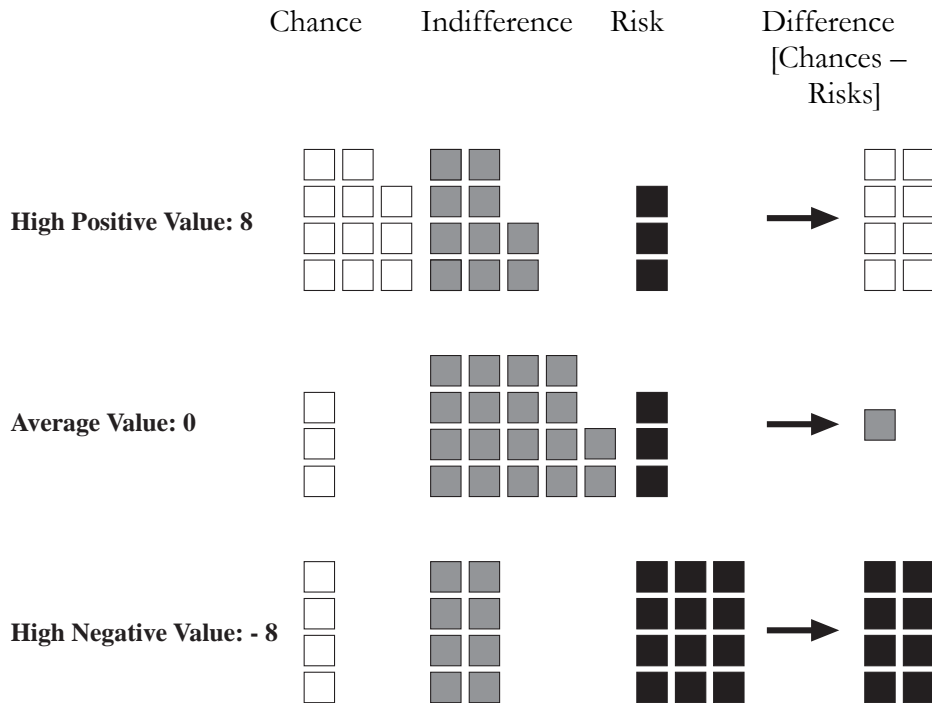
setting domains respectively. Thus, on a priori grounds, any position of risk or of life chances can and will be considered of equal importance – and, thus, of equal weight.

- Second, the aggregation goal lies in the summation of the overall number of risk positions irrespective of their origins and the overall number of chance positions, once again irrespective of their origins. Quite obviously, the possibility for simply adding all positions of risks or life chances into a single number respectively, rests on the postmodern equal weight assumption. Due to these equal weights, risk positions in areas like emotions, life satisfaction or social networks carry the same impact or weight as the classical indicators for status and inequality like income, qualification or occupational status. It goes without saying that the equal weight condition for risks has itself a highly risky status, too.

Since this form of aggregating across risks and life chances may seem new or unusual, a concrete example will be provided which should highlight the operational side of the new aggregation procedure. Diagram 4 shows three examples how the risk-, indifference- and chance-positions of a survey-respondent can be transformed into a single value. Using social survey-data for the 24 dimensions in Figure 2, Figure 4 shows the case of three individuals who on the basis of their distribution of socio-economic risks, indifference values and life chances receive very different overall values.

- The first individual has an overall number of eleven positions on different dimensions of life-chances, a total of three risk-positions as well as ten indifference positions and reaches, thus, a relatively high value of $[11 - 3] = +8$.
- The third individual accumulates a total number of eleven socio-economic risks, of three life-chances only (as well as ten indifference positions) and obtains, thus, $[3 - 11]$ a high negative value (-8).
- The second individual occupies an intermediate position with a total of eighteen indifference values on various essential dimensions, of three risk positions, of three positions of life chances and a resulting value of $[3 - 3] = 0$.

In this manner, each respondent in a survey can be assigned a single value, depending on the overall differences between the total sum of socio-economic chance positions and the total sum of socio-economic risk values.

Figure 4 A New Aggregation Procedure

The fifth step in the PATHS-strategy generates a new vertical scale which, despite the integration of multiple dimensions for living conditions, can be interpreted in terms of inequalities, socio-economic disparities or social exclusion for that matter. In general, for a total number of N dimensions and, thus, N socio-economic indicators, the new scale of inequality or socio-economic disparity ranges from $-N$ to $+N$. $-N$ is reserved for individuals with a maximum number of risk positions (no indifference positions, no positions of life chances) and $+N$ is occupied by individuals with life chances across all indicators (no indifference position, no risk position) In between, the new scale has $2(N - 1)$ different degrees. Due to the overall construction of risks, life-chances and aggregation procedures, the distribution pattern for a given population must result in a normal distribution with a mean-value around zero.

In this way, a new vertical scale and measure has been obtained which starts from a given population (Step I) with a multidimensional configuration of micro-data with N indicators, representing core aspects of living conditions and attitudes and reflecting the heterogeneities of the postmodern condition

(Step 2). After specifying distribution-dependent threshold values for risks and life chances (Step3) and a holistic aggregation procedure (Step 4), a single value for each individual can be obtained which lies within a scale of $-N$ up to $+N$ and which can be interpreted as a measure of social inequality, of socio-economic disparities or, alternatively, of social exclusion or social inclusion (Step 5).

4 Socio-Economic Risks and Life-Chances: Strong Ties with the Theory of Evolution

Having introduced the new approach on socio-economic risks and life chances in its entirety, it might be asked why this framework has been categorized as evolutionary. At first sight, evolutionary theorizing on mutation and selection in the natural world seems too far away from living conditions and essential barriers in the socio-economic universe. Thus, a group of arguments will be built up why the notion of an evolutionary risk-framework is not simply a second best choice given that the best choice for a trademark, namely the concept of systemic risks, is already strongly connected and tied with a particular risk perspective and with Niklas Luhmann as person in particular. On the contrary, the present approach on socio-economic risks exhibits a substantial number of evolutionary deep-structures²⁶ which may be difficult to detect at the surface but which move the socio-economic risk-approach within the wider arena of contemporary evolutionary theorizing.²⁷

First, the new risk approach can be applied primarily to actors where the actor concept must be understood in an unusually wide sense, covering not only persons or groups of persons like households but also organizations, again very broadly understood, like firms, voluntary associations, government agencies or scientific institutes. In addition, spatial ensembles like a city district, a county, a nation, a group of nations can be chosen as the

²⁶ For reference points of the contemporary structure of evolutionary theory, see, among many others, Bendall 1983, Brooks/Wiley 1988, Casti/Karlqvist 1995, Dennett 1995, Ereshefsky 1992, Goodwin 1995, Kauffman 2000, Lloyd 1994, Margulis 1981/1993/1998, Maynard Smith 1982, Michod 1999, Oyama 2000, Oyama/Lewontin 2000, Riedl 1980, Rosen 1991, Shaffner 1999, Sigmund 1995, Skelton 1993, Skole/Goodwin 2000, Sober 1986 or Weiner 1995.

²⁷ After an early mismatch between evolution and the social world under the heading of "social darwinism", a new intra-scientific integration is well under way in which societal dynamics, especially the economic side, is more and more conceived of and conceptualized as evolutionary. For the economics side, see, for example, Anderson/Arrows/Pine 1988 or Arthur/Durlauf/Lane 1997; for linking societal development with evolution, see, *inter alia*, Durham 1991, Fabian 1988, Freese 1997, Jones/Martin/Pilbeam 1995, Koch 1986 or Lumsden/Wilson 1981.

basic focus for risk-analysis as well. Moreover, persons, organizations or spatial ensembles can be situated at different levels, ranging from local levels up to urban, regional, national, supra-national or global levels.²⁸ Thus, the variable x in “ x at risk” can assume values from individual persons, households, organizations or spatial ensembles.²⁹ Interestingly though, this scope of potential applications in socio-economic risk-research is structurally similar to the overall evolutionary framework where the analysis can be concentrated on a multi-level arena of individuals, species or spatial eco-systems as well. Additionally, the units of analysis are not to be confined to a specific reference set only like individuals in the case of socio-economic risk research or genotypes within the evolutionary framework. Rather, the units of analysis vary, depending largely on the structure of the underlying research question.

Second, the approach on socio-economic risks has its focus on characteristic features or dimensions of actors, organizations or spatial ensembles. These core features should be distributed over the internal as well as over the external side of actors, organizations or spatial ensembles. Thus, the cognitive-emotional organization, the sensory order of actors or the within-organization of organizations have to be as much part of the list of central characteristics as the specific interaction patterns or the frequency of interactions in specific actor contexts or organizational environments. Here, a more obvious link to evolutionary theory can be established since these essential features of the intra- and interaction potential of actors, organizations or spatial ensembles can be classified as important characters which has performed as a core concept within the evolutionary framework from its very beginnings. Darwin’s “Origin of Species” even starts with the observation of high variations in important characters of individuals within the same species (Darwin 1979) where important characters were located at the level of the individuals themselves as well as at the level of their habits or, alternatively, instincts.

Third, the new socio-economic risk-approach uses populations of actors, organizations or spatial ensembles and the distributions of characteristic features within specific populations as its only reference point for defining the thresholds for socio-economic risks or life-chances. Populations can be defined over the entire set of persons, organizations and spatial ensembles as

²⁸ On more elaborate versions on actors and multi-level configurations, see Hollingsworth 2002.

²⁹ More concretely, in “ x at risk” x can be replaced with the names of specific persons, with a special district in a city, with a particular life-course (youth, old people, etc.) or gender group (women, men), with a nation, with an occupational group (blue collar workers, technicians, etc.).

well as over the entire range of levels (local, regional, national, supra-national, global). Due to this focus on specific populations and the distribution of important characters within a given population, an important deep structure link has been established with the evolutionary framework which from its very structure must be focused on specific populations or species and the distribution of core characters within given species. Otherwise, evolutionary concepts like fitness or catch phrases like the survival of the fittest would become completely tautological and void of any empirical content or predictive impact.

Fourth, socio-economic risks and life chances, defined for specific populations of actors or spatial ensembles constitute, thus, comparative advantages and comparative disadvantages in core characteristics of actors, organizations and spatial ensembles. Turning to evolutionary theorizing, comparative advantages and disadvantages of characters or traits have become the basic ingredients in the operationalization of measures of fitness, broadly conceived and in the construction of fitness landscapes.³⁰ Initially, no obvious link can be found between fitness in biological fields and risks and life chances within the social world. Nevertheless, socio-economic risks and life chances have been used to introduce a new risk-chance based scale, ranging, as has been already demonstrated within the previous section, for a given number of essential characteristics N from $-N$ (maximum number of socio-economic risks) to $+N$ (maximum number of socio-economic life chances). Upon closer inspection, this new inequality scale and the particular values on this scale offer one possible way to evaluate the overall position of an individual, an organization or of a spatial ensemble within their specific environments or, alternatively, within a particular population of individuals, organizations or spatial ensembles. Moreover, the various dimensions for socio-economic risks and life chances as well as the new risk-chance based evaluation measure can be used to construct specific risk-chance landscapes. In this sense, the new risk approach, too, is able to specify a general evaluation measure for the socio-economic world which fulfills the basic formal requirements for the evaluation measures within the evolutionary framework.³¹ and to build up various landscapes of risks and chances for individuals, organizations or spatial ensembles.

³⁰ On this point, see especially Kauffman 1990/1993/1995.

³¹ On formal requirements for fitness functions, see, for example,

Table 5 Deep Structural Similarities and Homologies between the New Risk Approach and Evolutionary Theory

	SOCIO-ECONOMIC RISK APPROACH	EVOLUTIONARY FRAMEWORK
DOMAIN	Actors, Populations of Actors, Spatial Ensembles	Individuals, Species, Eco-Systems
FOCUS	Essential Characteristics (Internal/External) of Actors and Spatial Ensembles	Important Characters (Internal/External) of Individuals, Species and Eco-Systems
CORE CONCEPTS	Risks and (Life) Chances	Comparative Advantages and Comparative Disadvantages
POPULATIONS AS REFERENCE POINT	Thresholds for Risks and Chances Dependent on Population Distribution	Thresholds for Comparative Advantages and Disadvantages Dependent on Population Distribution
EVALUATION MEASURE	Risks and Chances as Constituents for an Inequality Measure and for Risk-Chance Based Landscapes	Comparative Advantages and Comparative Disadvantages as Constituents for a Fitness Measure and for Fitness Landscapes
DYNAMICS	Risk-Chance Drift	Natural Drift
TYPES OF DYNAMICS	All Possible Forms, Including Path-Dependencies and Memory-Effects	All Possible Forms, Including Path-Dependencies and Memory Effects
RESTRICTIONS	Not Universally Applicable within Domain and Focus	Not Universally Applicable within Domain and Focus

Fifth, probably the most important link between the new socio-economic risk approach and evolutionary theory can be established when moving to the dynamics of risk and chances. From the construction of evaluation measures and risk-chance landscapes, it follows directly that individuals, organizations and spatial ensembles follow along specific trajectories within the risk-chance state space over time. The importance of such a measure can and should be seen, *inter alia*, in the formation of a general drift alongside the risk-chance-axis. In evolutionary theory, natural drifts (Maturana/Varela 1987:119pp.) have been defined as the general directions and tendencies in the results of repeated replications of the genetic make-up of biological species and organisms. Within the socio-economic risk-framework, the notion of a societal drift may be characterized as a general direction inherent in any of the risk-chance dimension. Thus, the evaluation measure in terms of risks and chances can be interpreted as an arrow or a gradient which manifests or reproduces itself in the course of recurrent day to day practices and in daily decision making. More specifically, the risk-chance axis implies that actors can be characterized in an (almost) tautological sense by a general disposition or preference for the selection or the search of chance-domains whenever such a selection or search process is possible or, alternatively, by the avoidance of risk-areas.

Sixth, despite the wide applicability of the socio-economic risk approach and of the social drift of risks and chances it must be clearly stated that the risk-chance axis is not a universal societal evaluation measure, being applicable to all essential characteristics of actors or spatial ensembles. For a socio-economic core dimension like partnership, it would be extremely difficult to attribute risk-chance values to the status of being single, married, living together with a partner, etc. Likewise, the fact that partnerships can be maintained without children, with a single child, with two children or with more than two children, cannot be transformed along the risk-chance dimension. Thus, even within a core domain like partnership, no meaningful and justifiable risk-chance attributions can be performed. Interestingly though, the same situation occurs for comparative advantage and disadvantages of important characteristics within the evolutionary framework since only a subset of core features is actually used when determining the fitness of individuals or species.³² As a consequence, both evaluation measures have their in-built restrictions and limitations and one has to select, thus, very carefully for which types and classes of variables an interpretation in terms of risks and chances or comparative advantages and disadvantages in fitness can be applied.

³² Take, for example, a highly organized species like elephants then

Seventh, like in the evolutionary framework generally, the new socio-economic approach to risks is compatible and dependent on a wide range of patterns and trends which cover all possible configurations from linear and gradual types to non-linear and chaotic configurations. Thus, like in the wider evolutionary contexts, the close semantic affiliations between evolution and gradualism has to be replaced entirely by a new semantic map where gradualism, linearity or point-attractors become just one of many possible dynamic configurations for evolutionary processes both in the natural and in the social universe.³³

These seven arguments combined offer sufficient grounds why the new approach to risks and chances will run as evolutionary risk research and the entire approach as an evolutionary risk-framework.

5 The New Links between Risks, Inequality and Health

The comparative advantages of a new approach do not lie primarily in the field of conceptual sophistication and differentiation, but in the range and the frequency of successful problem solutions.³⁴ Towards the end of this paper, The next figures will demonstrate the usefulness and the comparative novelty of the new approach towards inequality or social exclusion.³⁵

- First, the new vertical scale fulfils the conventional criteria for inequality, socio-economic disparity or social exclusion by showing that it reproduces the patterns generated with classical indicators like income or qualification. In other words, individuals with lower incomes or insufficient qualifications must be highly concentrated

³³ On the entire range of dynamic patterns, see, among others, Casti 1992/1994/1996/1997/2000.

³⁴ On this point, see, for example, Donovan/Laudan/Laudan 1988, Kuhn 1973/1977, Lakatos 1979/1984, Laudan 1977/1981, Lakatos/Musgrave 1974, Laudan/Laudan 1988 or Popper 1965/1968/1972.

³⁵ The new scale can be used for the operationalization of the terms of social exclusion/inclusion as well, with $-N$ as its extreme value for a maximum degree of socio-economic exclusion and $+N$ as the maximum degree of socio-economic inclusion. Thus, the maximum degree of socio-economic exclusion is obtained if and only if a network actor occupies a risk position in each of the socio-economic dimensions of the indicator class. Likewise, the maximum degree of socio-economic inclusion is reached iff a network actor occupies a chance position in each of the socio-economic dimensions of the indicator class. Finally, the zero-level of socio-economic exclusion/inclusion is reserved, *inter alia*, for those instances where a network actor occupies an indifference position in each of the socio-economic dimensions of the indicator class. To give a concrete example from the indicator class of the Austrian Social Survey, -24 is reserved for 24 risk positions by a network actor, $+24$ for 24 chance positions and 0 for 24 indifference positions or for any other distribution, resulting in an equal number of risks and chances.

among the lower strata of the new risk-chance scale. Using the empirical example from the Austrian Social Survey, Figure 5 demonstrates this point very clearly. Its upper half shows that the lowest decile on the new risk-chance scale consists of almost 70% of persons with compulsory education only and the remaining 30% come from people with intermediate degrees whereas practically nobody with university degrees belongs to the lowest group. At the upper end, the highest decile (90 – 100%) is composed of few persons with compulsory education only (18%), of a broad group of individuals with university degrees (25%) and of a large segment of intermediate qualifications. Seen in another perspective, the probability of belonging to the highest decile, given a university education amounts to almost 50% whereas the probability for individuals with compulsory education reaches hardly 4%.

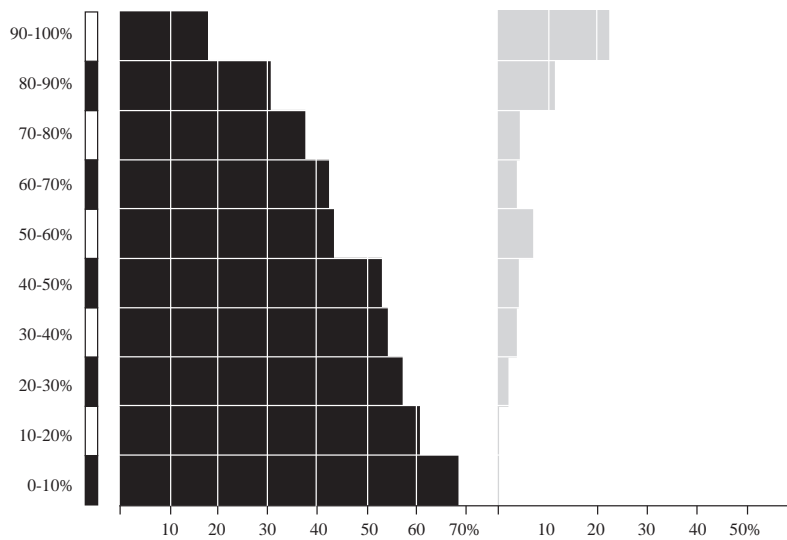
- Second, persons with high levels of income (above 2000 Euro) are strongly concentrated within the highest decile whereas persons with small or marginal personal incomes are to be found most frequently in the lowest decile of the lower half of Figure 5. Moreover, the percentage of persons with low or marginal incomes decreases in a linear fashion across the ten deciles, being highest at the lowest decile with almost 50% and lowest for the highest decile with below 5% only.³⁶
- Third, the gender distribution along the scale of multiple risk and multiple life chances reconfirms recent studies and analyses which emphasize a deep-seated gender divide within contemporary societies. More specifically, the investigations conducted so far indicate a high concentration for women at the lower end of the scale and a somewhat weaker predominance of men on the upper end of the scale. In numbers, the ten to twenty percent of a population with the highest degree of multiple risks exhibits a gender distribution of 2:1. In other words, two thirds of a population with the highest accumulation of unspecific risks is female.
- Fourth, the age distribution of the population of multiple risks and multiple chances may seem surprising at first sight since there is a small tendency across various national or international surveys for weak linkages between multiple life chances and higher age or, alternatively, between multiple risk-formations and younger age cohorts.

³⁶ Moreover, the average values for a specific indicator, say personal income or degrees of education, for the lowest decile and the highest decile of a population offer essential insights of existing socio-economic disparities within a country.

Thus, with the new perspective on multi-dimensional data integration of individual living conditions, valuable new insights can be gained on the profiles of societal inequalities as well as on the prevalent patterns connecting socio-economic living conditions with the status of health, ailments or sickness.³⁷

Finally, the new perspective on multi-dimensional integration of living conditions and attitudes offers some genuine “value added” by establishing much closer links between health conditions of individuals on the one hand and their position on the risk-chance scale. Figure 6 highlights this result by showing that the correlations between the new vertical measure and the personal status of health or ailments and illness are considerably higher than the conventional results, relying on the classical measures for stratification like years of education, personal or household income or on any combination between these two indicators.

Figure 5 The New Scale for Vertical Distances and Qualifications
Share of Individuals with Compulsory Education only(%) **Share of Individuals with Higher Vocational Degrees or University Degrees (%)**



³⁷ With this term, a weak linkage should be established to the contemporary discussion on the basic shapes of “civil societies”. (See here especially Cohen/Arato 1999, Eberly 2000 or Etzioni 1998)

Figure 5 The New Scale for Vertical Distances and Qualifications (Continued)

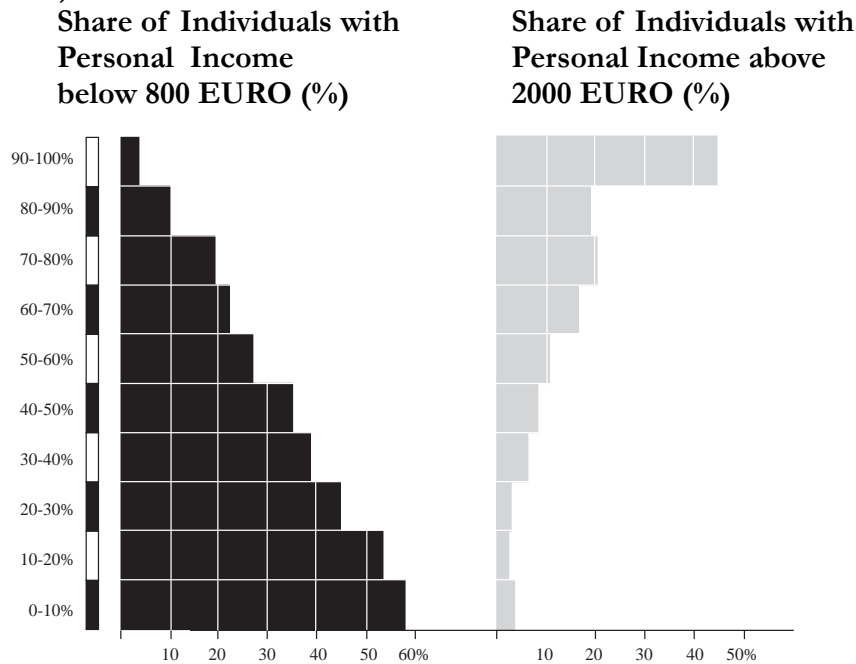


Figure 6 shows that the two most favorable combined indices, the one under the label of “status I” (personal income & degree of education), the other under the label of “social status II” (household income & degree of education), are considerably less connected and correlated with the actual health conditions of individuals. Thus, the new perspective on integrating various aspects of contemporary living conditions suddenly opens up new and unexpected linkages with the status of personal health as well.

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Moreover, Figure 7 and Table 4 re-affirm, once again, the new surplus value of the risk and life chance analysis, developed so far. Figure 7 shows that the relations between multiple risk and life chance accumulation and the overall status of health remain relatively constant across regional, national or international surveys. And Table 4, finally, shows in greater detail that the new perspective on risk and chance inequalities turns basically all essential linkages between living conditions and health, ailments or sicknesses into significant ones. With the exception of allergies and chronic bronchitis, suddenly all previously non-existent linkages could be brought back to the social science health agenda.

It goes without saying that the results so far seem sufficiently promising to apply the new evolutionary perspective on socio-economic risks and life chances to new data sets in order to strengthen the empirical validity and reliability of the perspective in general and of the new vertical inequality scale in particular.

Figure 6 High Correlations between the New Measures of Inequality and Health Conditions

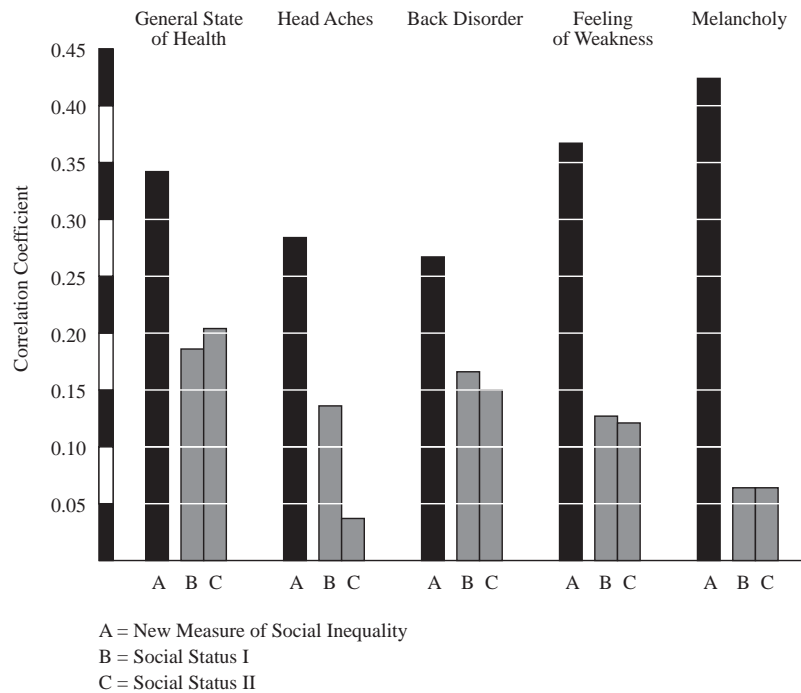


Figure 7 Multiple Risk/Chance Groups in Austria, Denmark and Slovenia and the Correlation with Health

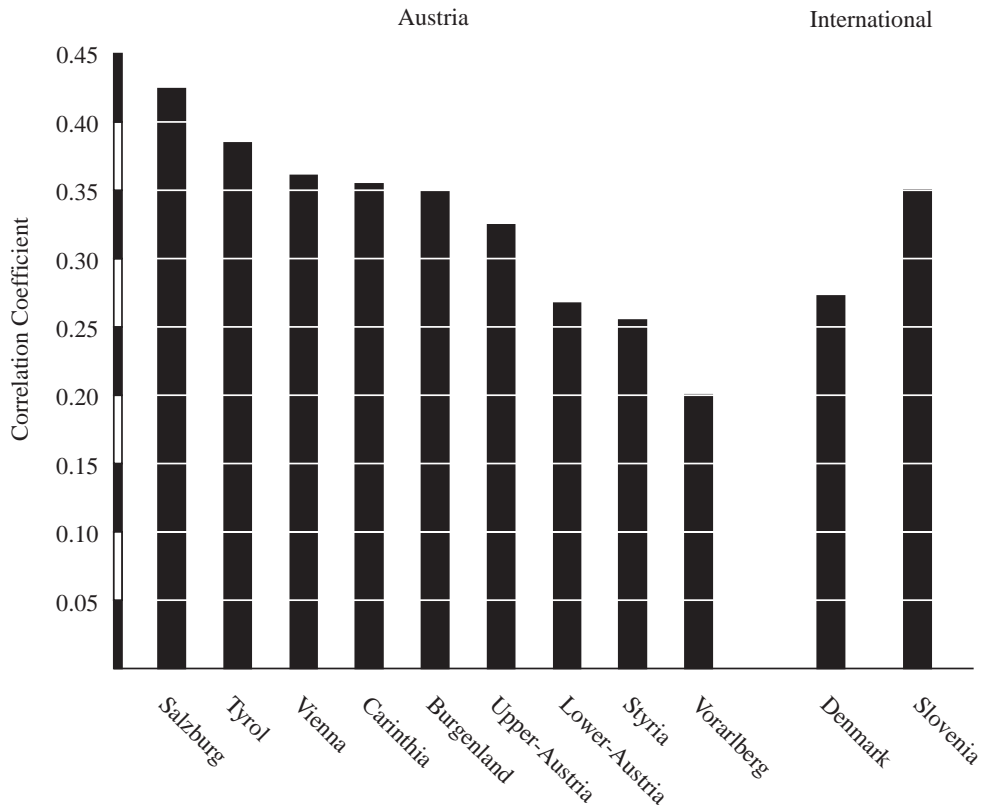


Table 6 Correlations with Health Indicators

Pearson Correlations	Multiple Risk vs. Multiple Chance	Social Status ¹	Social Status ²
General State of Health	,342**	,186**	,204**
Physical capability	,248**	,111*	,152**
No illnesses	,205**	,104*	,134**
Rapid palpitations	-,230**	-,155**	-,215**
Head aches	-,284**	-,136**	-,037
Nausea	-,214**	-,046	-,053
Back disorder	-,267**	-,166**	-,150**
Dyspnoea	-,325**	-,146**	-,208**
Feeling of weakness	-,367**	-,127*	-,121*
Heavy sweating	-,248**	-,093	-,095
Sleeping problems	-,154**	-,119*	-,167**
Feeling of dizziness	-,343**	-,192**	-,198**
Pains or discomforts in chest	-,253**	-,095	-,105*
Restlessness & nervousness	-,322**	-,093	-,069
Melancholy	-,424**	-,064	-,064
Heart, circulation	-,228**	-,176**	-,199**
Rheumatism	-,121*	-,155**	-,168**
Chronic bronchitis	-,085	-,015	,048
Allergy	-,058	-,050	-,034
Discopathy	-,158**	-,119*	-,110*
Intestinal or stomach complaints	-,058	,029	,008
Diarrhoea, constipation	-,121*	-,031	-,084
Indigestion			
Migraine	-,113*	,060	-,098

1. Based upon net income and education

2. Based upon net household income and education

3. **: significant at the 0,01 level; *: significant at the 0,05 level

Data: Social Survey Survey '93

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Living Conditions, Socio-Economic Risks, Inequality and Health. Establishing New Theoretical Foundations and Closer Empirical Linkages

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Abstract¹

The paper will present new theoretical and empirical perspectives which contradict the conventional wisdom on the inter-relationships between living conditions, socio-economic risks, social inequalities and the state of health within and across contemporary societies.

- Part I will summarize the “received views” and will show that from a theoretical point of view the problem of linking living conditions, conceived in a diversified and multi-dimensional manner, inequality, socio-economic risks and health simultaneously has produced, so far, an empty set of conceptual solutions. Multi-dimensional approaches towards living conditions, running under the headings of life-styles, have lost their vertical inequality dimension, conceptions of contemporary risk societies have been constructed beyond the domains of socio-economic living conditions, viable research traditions on stratification and inequality bear no relations with health issues and current research on inequality and health uses a very narrow focus of economic inequality and income distribution only. From an empirical perspective though, the need for integrating socio-economic risks, living conditions, broadly understood, inequality and health is of only marginal relevance since the linkages between these different domains, expressed in statistical measures like correlation coefficients, are comparatively weak and, moreover, are undergoing a process of gradual dissolution.
- Within Part II, a new evolutionary approach on socio-economic risks and on socio-economic risk groups will be introduced which embeds risks into objective as well as subjective dimensions of living conditions. Additionally, the new operationalization of socio-economic risks will be accompanied by the introduction of a complementary notion, namely by the concept of socio-economic life chances. Consequently, socio-economic risks and life chances will be used for the construction of a new vertical scale for societal inequalities and disparities, with risk-accumulation on the lower end of the scale and life chance accumulation on the upper end. Moreover, the new vertical scale on inequality will be able to capture the multi-dimensional and heterogeneous aspects of post-industrial or, alternatively, postmodern lives.
- In Part III, it will be demonstrated that the new vertical scale based on risks and chances fulfills the empirical requirements for a measure of social inequality. Using the EUROMODULE-data from six countries (Switzerland, Austria, Germany, Spain, Slovenia, Hungary), it will be shown that socio-economic risk accumulation

¹ For the diagrams in this article, a special thank goes to Michael Eigner (Vienna) who transformed vague ideas and concepts into an interesting graphic design.

is accompanied by low income and by low degrees of education and qualifications and affects a significantly higher proportion of women whereas, towards the upper end of the scale, accumulated life chances are strongly linked with high income, high qualifications and a significantly higher share of the male population.

- Part IV will extend the new platform on socio-economic risk-analysis and inequality to the health domain. In doing so, it will generate surprisingly strong and powerful linkages between the position on the new inequality scale and overall life satisfaction, on the one hand, and the state of health on the other hand. More concretely, the new approach towards risks and inequality will provide substantially new empirical evidence on the direct impact of unequal socio-economic living conditions on overall life satisfaction, on the state of health in general and on ailments, mental health or sicknesses in particular.

Towards the end of the paper, a short note on the neuro-physiological basis for these new patterns will be provided which should give additional justification to the new evolutionary perspective on multi-dimensional living conditions, socio-economic risks, inequality formations and the state of health.

The article will start with a summary of guiding assumptions and empirical hypotheses which capture the essence of the available knowledge base in the interface domain of living conditions, socio-economic risks, inequalities and health. As often, niche-buildings, disciplinary boundary formations and gate-keepings within the social sciences, social psychology and medical research have created as a largely un-intended side-effect a practically empty set of theoretical answers for the important questions on the inter-relationships between living conditions, inequalities and health on the one hand as well as a powerful empirical justification on the irrelevance of establishing such an interface-platform on the other hand.

1 The Conventional Wisdom on Socio-Economic Risks, Inequalities, Multi-Dimensional Living Conditions and Health

The conventional wisdom on the linkages between living conditions, inequality, risks and health can be captured in the following eight guiding assumptions, five of them theoretical, three empirical in content:

- First, multi-dimensional approaches on living conditions (see esp. Schulze 1992) have become, by and large, horizontally stratified, loosing their vertical dimensions in the course of widening the relevant socio-economic dimensions. Thus, current life-style frameworks, while focusing on a broad range of living conditions and socio-cultural practices, have become by and large unable to arrange the resulting life style formations into a vertical ordering.
- Second, with respect to Weberian or Neo-Weberian approaches (see e.g., Blau/Duncan 1967, Giddens 1973, Hodge 1981), the main emphasis on social inequality goes hand in hand with substantial restrictions on the admissible set of socio-economic resources and

living conditions. In sum, the actual space utilized for the Weberian status groups is only covering a small domain of the much broader range of post-industrial lives (Hage/Powers 1992).

- Third, current class-approaches with multi-dimensional scope and vertical stratification, especially the frameworks by Pierre Bourdieu (1982/1985) or Eric Olin Wright (1997), exhibit significant shortcomings to incorporate the domains of socio-economic risks and health conditions and are in all probability ill-suited to be able to integrate these field into their research program.
- Fourth, the concept of risks and risk-societies has been developed, especially within the German sociological tradition, in a highly specialized manner, restricting the notion of risks to contemporary technological advances within a post-industrial societal development stage (Beck 1986) or to decisions under conditions of uncertainty and accountability (Luhmann 1991). Thus, within current societal risk-research, no pattern between risk-societies and social inequalities or health has been established.
- Fifth, recent advances in linking health with socio-economic conditions (especially Wilkinson 1996), have been concentrated on a small set of economic variables only and have, thus, neglected the multi-dimensionality of contemporary living conditions. Besides, the wide arena of socio-economic risks, apart from monetary risks, has not been incorporated within the fifth theoretical tradition.

In effect, a trade-off has been produced between a new emphasis on postmodern living conditions and a new wave towards individualization on the one hand and vertical stratification on the other hand. Interestingly though, this trade-off can be substantially reduced in its cognitive impact since three essential empirical findings have been identified on the relatively weak or marginal linkages between multi-dimensional living conditions, socio-economic risks, inequality and health.

- Sixth, the linkages and correlations between essential dimensions of living conditions, traditionally associated with social inequality like qualifications or income, and subjective general performance assessments like overall life satisfaction turn out to be significant, though rather weak.²
- Seventh, significant, but moderate and weak linkages only can be identified between the key indicators of vertical inequality like income and education with the general state of health.

² In more precise terms, correlations are to be qualified as (weakly) [medium], {strongly} significant iff they fall into the range of (0.1 to 0.25) [0,25 – 0.4] {> 0.4}

- Eighth, for highly advanced societies the links between core-inequality indicators like income or education with subjective self-assessments are considerably weaker than in the transformation societies of Central and Eastern Europe or for advancing societies in general. Similarly for the health domain, the correlations between inequality indicators and health become weaker still in the case of highly advanced nations.

Thus, the course of modernization or post-modernization produces apparently a pattern of growing independence between overall self-assessments, health and the cognitive-emotional organization of actors on the one hand and their socio-economic resources and living conditions on the other hand. Within the first section, these eight guiding assumptions will be discussed in greater detail and with the help of empirical data as well.

1.1 The Failures of Incorporating Inequality and Risks into Multi-Dimensional Approaches of Living Conditions

The first path within the current theory space along the dimensions of multi-dimensional living conditions, risks, inequality and health starts with a broad view on living conditions, synthesizes and clusters these multiple dimensions into different “life styles” and loses in the course of clustering the vertical dimensions of inequality or socio-economic risks for that matter.

The subsequent discussion will have its focus mainly on Gerhard Schulze’s book on „Erlebnisgesellschaft“ (1992). Here, a representative sample of roughly 1000 persons from the city of Nuremberg has been selected and a large number of questions on cultural practices or on daily routines of information gathering have been asked. In the theoretical core of Schulze’s work lies a universal social grammar (Ibid 243pp.) which, at least according to Schulze, is capable to detect and identify hidden homologies between inhomogeneous and seemingly contradictory or incoherent domains. At various places, Schulze speaks of a latent pattern which connects diverse surface appearances or of a universal pattern in the relation between actors and their environment or worlds (Schulze 1992:36).

Essentially, Schulze uses age and education as the basic socio-demographic dimensions in order to differentiate between five different milieus or lifestyles, namely between an entertainment-milieu (age low, education low), a harmonious milieu (age high, education low), a self-realization-milieu (age low, education high), an integrative milieu (age high, education medium) and a distinctive high-level milieu (age high, education high). Each of these five milieus is characterized by specific recombinations between dominant forms of style which are summarized under the headings of high culture, trivial culture or excitement/event culture.

Within the present context, the most important critical finding lies in the fact that the new life-style typologies which have been able to integrate large proportions of everyday routines and cultural practices, widely conceived, have lost the vertical dimension of inequalities almost completely. While these five life-styles can be arranged within a two-dimensional field, consisting of degrees of education on the one hand and age on the other hand, vertical distances and vertical inequalities have been largely reduced and replaced by horizontal disparities of self-contained clusters of socio-cultural practices. Additionally, classical problems of upward and downward mobility are substituted by new rites of passage, with age being a key determinant to change from one lifestyle-cluster to the next. Furthermore, problems of inter-generational inequality and mobility seem to have been reduced to marginal issues since the universal grammar sub specie Schulze reproduces these different clusters in the way it is supposed to reproduce them, namely universally. Finally, the potential space for socio-economic policies has been greatly reduced, too, since these self-sufficient clusters do not lend themselves easily to intervention or compensation.

Apparently, Schulze's analysis and many other life-style studies³ are subject to a critical trade-off which can be summarized in the following manner. Relying on a small number of objective inequality indicators like income, education or status loses its linkages with overall self-assessments rapidly since many aspects and dimensions of cultural and everyday practices have not been included. Taking the diversified set of habits and routines in areas like information, housing, arts and culture, media or fashion into account, the resulting life styles have lost their connections with vertical dimensions and inequalities almost completely.

1.2 The Failures of Incorporating Risks and Health into Multi-Dimensional Approaches of Status-Groups

Second, within Weberian or Neo-Weberian approaches⁴, two clearly vertical stratification perspectives are opened up by distinguishing, on the one hand, classes and the economic order from status groups and the world of the social order. Classes are defined on the basis of the position and of the interests within capitalist markets which determine, to use a central Weberian term, the life-chances of large groups of individuals. Status-groups, on the other hand, are conceptualized as specific communities, sometimes of an amorphous kind, where the distinctive elements are

³ For other life-style studies, see for example Spellerberg 1996, Schneider/Spellerberg 1999 or for an interesting summary Matjan 1998.

⁴ For a summary on the Weberian tradition, see Parkin 1979, Sørensen 1991/1994 or Treiman 1977.

determined on the basis of a specific social estimation of honor and on particular life-styles which have become another core Weberian notion. Classes and status groups, the economic and the social order, are performing, according to Max Weber, any type of societal dance, sometimes very intimately linked, probably more often than not, opposed to each other and at times in aggressive disharmony.

While the conceptual differentiation within Weber's own work still can be considered as remarkably complex and multi-dimensional, the subsequent empirical research trajectories along Weberian lines suffer from the peculiar fact of being too highly reduced in their conceptual complexities. The wide design spaces for Weberian classes and status groups have been severely under-utilized so far since the index constructions leading to status scales are either based on occupational ratings or on small sub-sets of a considerably wider group of socio-economic indicators on living conditions or life-styles.

Thus, the Weberian and Post-Weberian traditions have retained their emphasis on vertical stratification, but apparently at the expense of restricting the multi-dimensionality of life styles and the social order to a small number of key variables only. Consequently, the available Weberian or Post-Weberian platforms simply have become too narrow for linking them with additional notions like risks and health-conditions. This situation is unfortunate since it would have been relatively easy to introduce risks within the context of life chances and of exclusion processes. Nevertheless, it would become far too risky to base socio-economic risks on a small number of empirical key variables only.

1.3 The Failures of Incorporating Risks and Health into Multi-Dimensional Approaches of Class-Analysis

The third integration attempt starts with current frameworks on class formation and vertical stratification and tries to integrate multi-dimensional living conditions within its overall framework. However, the traditional or post-traditional perspectives in this domain (for a most comprehensive summary, see Grusky 1994) share a fundamental shortcoming due to the clearly under-complex conceptual frameworks for reducing the complexities of current living conditions.⁵ Basically, three types of arguments can be put forward to support the assessment of a failure strategy.

Referring to contemporary class-analyses as advanced by Pierre Bourdieu (1982, 1985) or by Eric Olin Wright (1997), the main argument rests basically on too little diversity in the underlying class-concepts, including

⁵ For an interesting summary and discussion see e.g., Giddens 1989:209pp.

Bourdieu's habitus formations. In essence, two main-dimensions in the case of Wright (relations to means of production (including power relations) and qualifications (expert/skilled/non-skilled)) or the three Bourdieu dimensions with economic, social and cultural capital do not reach the requisite dimensional variety necessary for mastering the highly heterogeneous life-courses of individuals or households. Taking, for example, Ulrich Beck's phenomenology of life-styles and life-courses within his framework of contemporary risk-societies seriously⁶, one needs highly diversified multi-dimensional instruments in order to be able to identify vertical differences and social inequalities between individuals or households across different regions, age groups, gender-groups and the like. This argument of an under-critical conceptual core can be put in the format of a *reductio ad absurdum*.

Suppose there is the desired Bourdieu/Wright reference set of few class variables, taken from relations of productions (Wright) or from a more diversified three-dimensional capital space (Bourdieu), then this reference set has to be classified as exogenous in a very strong sense, being capable to explain empirical processes of attitude formations or living conditions – and being itself unexplainable by any of these factors. The reference set must act or function as a singular generator and effector for the empirically accessible diversity of life styles and attitudes. The main problem for such a restricted variable set arises from the multiplicity of different domains with different velocities in their adjustment processes and pattern formations. The realm of living conditions, political attitudes or civil practices is characterized by a high heterogeneity from very rapid to extremely slow process velocities so that any small set of key determinants or core factors is confronted with an insurmountable problem, namely with the lack of "requisite variety" (W. Ross Ashby) in the underlying conceptual apparatus.

The small set of exogeneous key factors lacks, by necessity, a sufficient amount of requisite variety in order to accommodate for the extremely wide and diversified range of process velocities and pattern formations which have become characteristic for contemporary societies. In other words, an instrument capable of explaining very heterogeneous domains alike must be itself very heterogeneous and diversified, too. Thus, any small set of key factors cannot achieve the necessary requisite variety and cannot cope, thus, with the heterogeneity of living conditions, life courses or attitude changes.

Due to the under-critical conceptual apparatus, multi-dimensional living conditions would have to be included into a class-analysis framework as

⁶ For a summary, see e.g. Beck/Beck-Gernsheim 1994, Beck/Sopp 1997, Beck/Erdmann Ziegler 1997.

additional components. However, such a strategy runs counter to the conceptual core of class-analysis, especially in the case of Pierre Bourdieu. But for Eric Olin Wright too, the problem of integrating living conditions into class analysis means for him to study the effects of class formations on living conditions in a peculiar way for which Wright uses a seemingly compelling analogy from medical research.

Class analysis is based on the conviction that class is a pervasive social cause and thus it is worth exploring its ramifications for many social phenomena ... Understood in this way, class analysis is what might be called an 'independent variable' specialty. It is a discipline like endocrinology in medicine. If you are an endocrinologist you are allowed to study a vast array of problems – sexuality, personality, growth, disease processes, etc. – in addition to the internal functioning of the endocrine system ... Endocrinology is monogamous in its explanatory variable – the hormone system – but promiscuous in its dependent variables. (Wright 1997:1)

Though considerably weaker, this version has the distinctive disadvantage that a large amount of "independent variable specialties" are available, in principle. Take age groups, cohorts, gender, regional differentiations or life-styles, to mention just a few, then one could justify their relevance for socio-economic analysis in Wright's own terms, namely "that age (cohort, gender, life style, region) is a pervasive social cause and thus it is worth exploring its ramifications for many social phenomena." In the end, the socio-economic endocrine system turns out to be itself highly "promiscuous".

To conclude, the two most advanced class approaches by Pierre Bourdieu and Erik Olin Wright are by their very structural organization unable to integrate multi-dimensional aspects of current living conditions, including, above all, the aspects of attitudes and self-assessments. Thus, it would be ill-founded to link socio- economic risks with second-best approaches.

1.4 The Failures of Integrating Inequality and Multi-Dimensional Living Conditions into Frameworks of Societal Risks

As a fourth trajectory in theory space, the two most prominent sociological perspectives on risk and risk formations⁷ in contemporary societies have been presented within a relatively short period during the late 1980ies, namely in Ulrich Beck's "Risikogesellschaft" (Beck 1986) and in Niklas Luhmann's views, culminating in a book on risk five years later (Luhmann 1991).⁸ In his national Post-Chernobyl bestseller, Ulrich Beck uses the

⁷ For a historical-conceptual summary on the emergence of risk, see, *inter alia*, Bernstein 1996, Bonß 1995.

⁸ On additional literature on risk-research especially within the German tradition, see Baecker 1988, Banse/Bechmann 1998, Japp 2000.

pattern of a phase transition between two stages in modernity as a general platform in which the notion of risks receives its proper attention. The initial stage is characterized, not surprisingly, as industrial or traditional capitalism. Driven by inner or endogenous necessities, industrial capitalism is superseded, however, by a new phase which has been labeled as risk society. Put briefly, risk societies have become the current stage in the capitalist evolution and a generalized logic of risk-production, in contrast to the logic of wealth production of the industrial phase, stands at its center. But despite a phase transition towards risk societies, socio-economic risks and inequalities have not found their way into Beck's framework. Rather, for Beck the question of social inequality seems to undergo a transformation itself, namely a secular change from vertical to horizontal forms. At various points, Beck gives the impression that social inequalities belong basically to the domain in which they originated in the first place, namely to the phase of industrial capitalism. Thus, combining Beck's framework with vertical social inequality runs the serious risk of contradicting the main structure of his transformation argument.

Niklas Luhmann, on the other hand, stresses the formation of risk production within the context of highly differentiated and highly complex social systems. In order to comprehend the bottom line of the argument, it is important to emphasize that Niklas Luhmann distinguishes, on the one hand, risks from dangers and, on the other hand, risks from damages or accidents. For Luhmann, risks are always conceived as *ex ante* and under the auspices of accountability whereas dangers like a potential earthquake, while likewise *ex ante*, are introduced under the conditions of non-accountability. Damages and accidents, on the other hand, are always occurrences *ex post* and can be viewed either as accountable – the effects of an actual high-technology accident - or as non-accountable like in the case of the impact of an actual earth-quake. Another important distinction for Luhmann lies in the differentiation between risk-actions and risk-systems. The latter are to be considered as any organized societal ensemble, ranging from marriages up to very large scale transnational enterprises. Due to the increasingly internal as well as external complexities, decisions within large scale risk systems have to be undertaken in view of growing uncertainties and in view of non zero probabilities for massive failures or large-scale accidents. Niklas Luhmann goes on to provide a fascinating array of examples which demonstrate various strategies of risk aversion or, above all, risk transfer from the inner side of complex risk-systems into their environment. Despite several illuminating insights, the overall framework is too weak a foundation for being able to incorporate social inequalities into its research agenda. Core domains of socio-economic risks like poor qualifications, hazardous working conditions or weak coping capabilities cannot enter into Luhmann's

decision-based framework which, like Beck's approach, does not lead even near the domains of social inequality.

1.5 The Failures of Incorporating Risks and Multi-Dimensional Living Conditions into Analyses of Inequality and Health

As a fifth major theoretical integration failure, current approaches linking health with social inequality suffer from the fact that they are centered on a small segment of available living conditions only, namely on income, financial poverty and income distribution. Highlighted, above all, by Richard Wilkinson's "Unhealthy Societies" (1996), a set of compelling arguments has been established on the close and direct linkages between income inequalities and the state of health.⁹

First, Wilkinson was able to stress the importance of the shape of income distribution as the key economic factor for the overall state of health. As an essential consequence for social and health policies, Wilkinson demonstrates convincingly that improving the absolute levels of income or living standards plays a clearly secondary or marginal role when compared to changes in the income distribution towards a more egalitarian shape.

Second, in his book Wilkinson was able to show (*Ibid.*, 113 – 172) how a wide class of ailments, sicknesses or mental disorders is relatively closely linked with a more general phenomenon which has been characterized by him as social cohesion. Once again, social cohesion varies significantly with different shapes of the income distribution, being high for egalitarian societies and low for very unequal societal formations.

Third, Wilkinson produces a substantial amount of cross-country evidence on the heterogeneity and of the high variety in national mortality rates as well as on their links with socio-economic positions. France, for example, exhibits large inequalities in alcohol-related causes of death but shows relatively insignificant linkages between socio-economic positions and death from heart diseases. Sweden and England, on the other hand, exemplify relatively small connections between socioeconomic strata and cancer mortality but strong links between death from heart diseases and low socio-economic positions. Adding the example of death from violence with a strong socioeconomic component in the United States it becomes relatively easy to generalize that both mortality and morbidity rates across various regions or nations are dependent to a significant extent to particular lifestyles within these regions and nations.

⁹ On recent literature of the links between health and society, see for example Davey/Gray/Seale 2001, Lupton/Najman 2001 or Petersen/Waddell 1998.

Fourth, Wilkinson puts forward a powerful conjecture on a new globalization pattern whereby local, regional or national socio-economic groups across the world at the upper end of the socioeconomic scale become increasingly homogeneous whereas the local, regional or national sections of society at the lower side of the vertical scale are subject to particular spatial clusters of morbidity and mortality.

The way of life of the upper socioeconomic groups in each country is more internationalized and so more homogeneous across countries. In contrast, lower socioeconomic groups are perhaps more likely to show the cultural characteristics particular to each country. (Wilkinson 1996:153)

Impressive as it stands, Wilkinson's book fails, however, to integrate a wider class of living conditions, both of the economic and, above all, of the social variety. While Wilkinson has put a renewed emphasis on the close linkages between income, income distribution and health-issues¹⁰, he fails to create a sufficiently wider socioeconomic framework which would account for essential living conditions outside the narrow confines of incomes or income distributions.

1.6 The Weak Links between Subjective General Self-assessments and Objective Dimensions of Social Inequality

With the present section, a shift from theoretical frameworks to empirical results has been undertaken. Within this paper, a large comparative data-set has been used and analyzed which has been compiled under the auspices of Wolfgang Zapf at the Science Center Berlin and which, under the heading of EUROMODULE¹¹, provides a comprehensive picture of living conditions both in their objective as well as in their subjective dimensions in five countries, namely in Switzerland, Austria, Germany, Spain, Slovenia and Hungary.¹² From Diagram 1, two general conclusions can be drawn.¹³

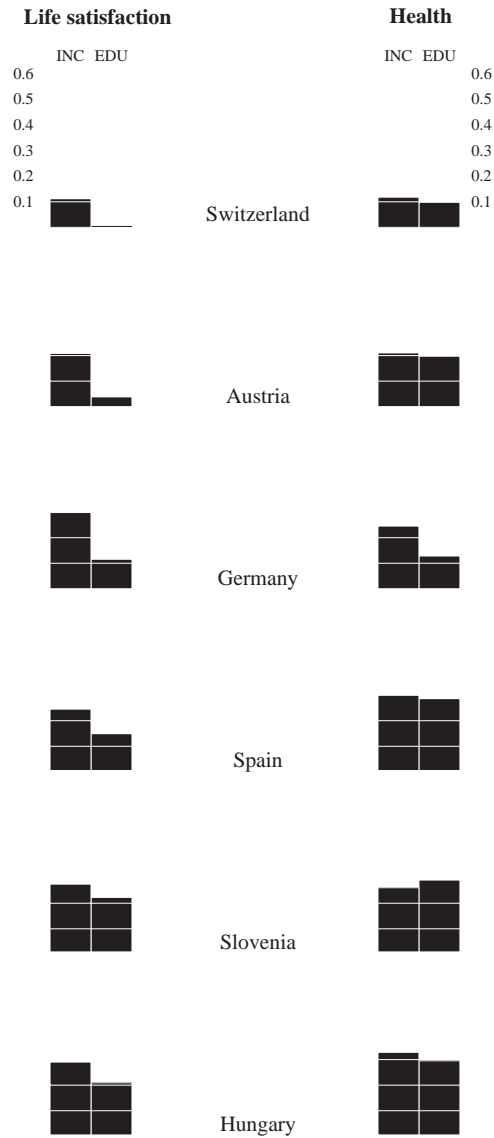
¹⁰ For a very informative summary on the intricate long-term relationships between health, health systems and state see for example Hollingsworth *et al.*

¹¹ For a Euromodule-documentation, see Delhey/Böhnke/Habich/Zapf 2001.

¹² It can be safely assumed that in the course of the next months, the number of countries will increase substantially so that the EUROMODULE produces a highly interesting comparative data set which is able to monitor existing dimensions of individual welfare, including the subjective side of self-assessments and evaluations.

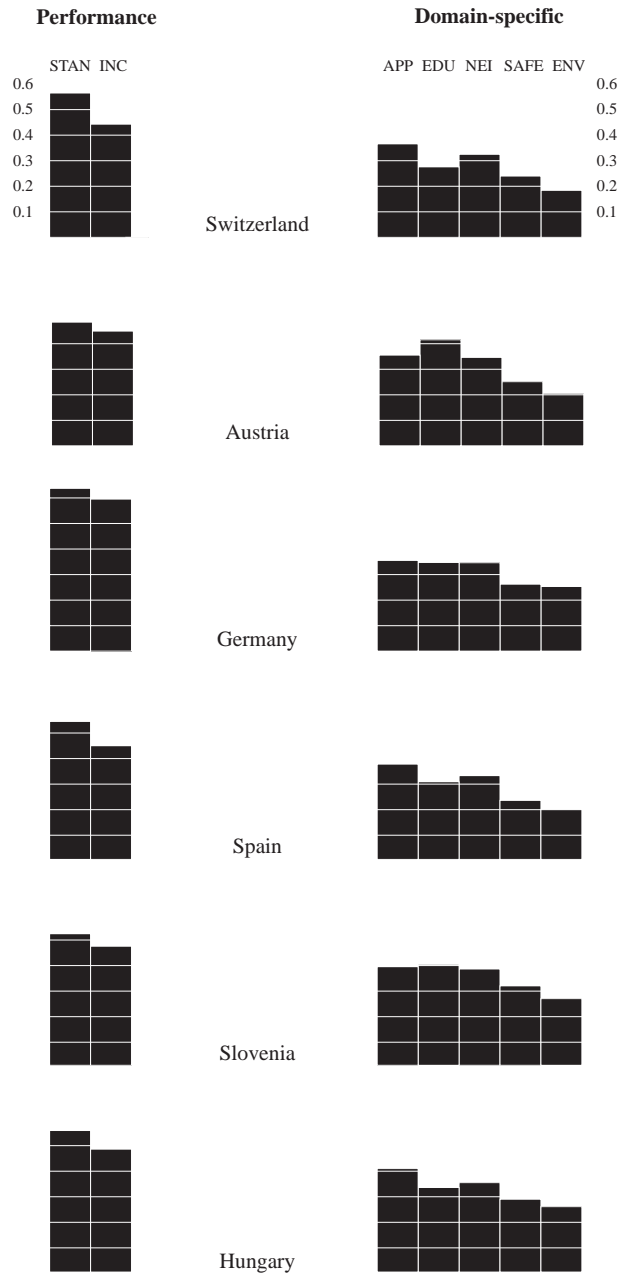
¹³ For the underlying apparatus of indicators, the following terminological remarks become necessary. First, indicators have been separated according to their source of information and confirmation into subjective and objective. Subjective indicators like the satisfaction with specific domains or with the life in general qualify as subjective since they can only be confirmed by the respondent alone. Conversely, indicators like the number of rooms, personal income, marital status, long spells of unemployment and the like count as objective, being measurable in principle via the help of other sources. Second, indicators can be grouped into performance and

Diagram 1: The Weak Correlation between Income and Education with Life Satisfaction and Health



domain-specific. Performance indicators characterize the overall state of an actor whereas domain-specific indicators are situated in well-defined domains like family, social structure, housing, employment and the like. In this sense, overall life satisfaction qualifies as a subjective indicator whereas the self-reported status of health falls, despite its actor-dependent assessment, under the objective performance category. (For a classical categorization of health at the inter-section of welfare (having)/levels of living, see Allardt 1981).

Diagram 2: The Strong Correlations between Different Forms of Overall Self-Assessments and the Relatively Weak Correlations between Overall and Specific Evaluation Domains



First, general self-assessments like overall life-satisfaction are significantly, though relatively weakly linked with a core class of socio-economic indicators which reflect, on the one hand, essential attributes of actors and are strongly associated, on the other hand, with social inequality. Thus, the degree of education as well as the total household income have been selected from the data-set and a correlation analysis has been performed with overall-life-satisfaction. In Diagram 1, one clearly recognizes that these correlations are situated in the range between zero and 0.3 and are to be qualified in most instances as of rather weak or of medium significance only.

Second, household income and qualifications differ rather substantially with respect to their correlation patterns with overall life satisfaction since in all instances one can observe higher degrees of correlation between household income and life satisfaction than between educational degrees and life satisfaction.

1.7 The Weak Links between Social Inequality and Health

Similarly, the links between the main inequality indicators like income or education with the general state of health can be assumed to be rather weak only. The right hand side of Diagram 1 captures the relevant empirical evidence and strongly supports the seventh guiding hypothesis, presented at the outset of the article. Looking at all five countries within the EURO-MODULE set, one detects a slightly more heterogeneous picture since one does not observe the same uniform rank-ordering across all countries between income and health on the one hand and educational degrees and health on the other hand. In one country (Slovenia), the educational degree is higher correlated with health than the income-health linkage whereas in the other four countries the same type of rank ordering persists that has been already found in the case of overall life satisfaction.

1.8 The Weakening Patterns between Societal Developmental Levels, Social Inequality and Overall Life Satisfaction

In contrast to the weak linkages between general subjective assessments and health on the one hand with social inequality on the other hand, Diagram 2 points to the fact of strong correlations between three different indicators assessing general subjective performances, namely between overall life-satisfaction, satisfaction with standards of living and, finally, income satisfaction. These high correlations must be emphasized especially in view of the fact that the auto-correlation of overall life-satisfaction with itself turns out to be roughly of the same numerical size than the correlation

between life satisfaction and standards of living.¹⁴ Thus, the three indicators of overall life satisfaction, satisfaction with living standards or income satisfaction should be seen as highly similar performance measures, assessing and evaluating the general state or position of an individual actor.

Additionally, Diagram 2 makes it rather obvious that assessment questions are not strongly correlated with each other simply by their virtue of being self-assessments. Taking more specific assessment indicators like satisfaction with one's home (APP), with the educational level (EDU), the neighborhood (NEI), public safety (SAFE) or the state of the environment (ENV), one can immediately recognize a marked discrepancy between general performance assessments on the one hand and specific domain assessments like the environment and public safety on the other hand.

Thus, in view of Diagrams 1 and 2, a strong final guiding assumption can be put forward which assumes weaker linkages between social inequality and subjective well-being in the course of societal complexification and diversification. Using performance measures for societal development levels or, alternatively, for societal complexity like GDP per capita, highly complex modern or postmodern societies like Switzerland and Germany exhibit lesser and weaker linkages between social inequality and subjective well-being than societies in Central and Eastern Europe like Slovenia and Hungary, while Spain, quite consistently, occupies a middle position. In this sense, the problem of the linkages between social inequality, living conditions, risks and health has lost its urgent and immediately relevant aspects since it belongs to the class of self-eliminating problems only, disappearing in the course of further societal development and evolution altogether.

Thus, the theoretical failure to integrate socio-economic risks, inequality, multi-dimensional living conditions and health is entirely compensated by the empirical evidence that an ever-weaker pattern connects these domains and will eventually vanish in the not too distant future.

2 Socio-Economic Risks and Life-Chances within an Evolutionary Context

Despite the initial failure of combining existing frameworks on risks, inequalities, multi-dimensional living conditions and health and despite the

¹⁴ As a highly illuminating, non-intended experiment, the question of overall life-satisfaction has been included in the 1984 Welfare Survey twice in the questionnaire, the first time at the beginning and the second time towards the end. The auto-correlation of the identically phrased life-satisfaction question turned out to be 0.6 only which is, following Diagram 2, roughly the same value than the correlation between overall life satisfaction and standard of living. (See Glatzer 1984, Zapf 1984)

empirical evidence on decreasing linkages between these arenas, four unusually strong hypotheses will be proposed, three of them empirical, one theoretical, which run counter to the previously established conventional wisdom.

- First, starting with the empirical side of socio-economic risks, living conditions, inequality and health, the linkages and correlations between multidimensional living conditions, newly aggregated, and subjective general performance assessments like overall life satisfaction turn out to be not only significant, but strongly significant.
- Second, significant and strong linkages can be identified between vertical inequality, newly conceived, and the general state of health.
- Third, for highly advanced societies the linkages between objective inequality indicators with subjective self-assessments are almost at the same levels than in the transformation societies of Central and Eastern Europe or in advancing societies in general. Similarly, the linkages between inequality indicators and health remain almost constant for highly advanced nations or for the advancing regions of Central and Eastern Europe. Thus, the course of modernization or post-modernization does not lead to a pattern of growing independence between overall subjective self-assessments or health on the one hand and their objective living conditions and inequality on the other hand.
- Fourth, in order to support these three counter-intuitive and, in view of Diagrams 1 and 2, seemingly risky assertions, a new approach will be built up which is able to combine and integrate multi-dimensional living conditions, socio-economic risks and inequality.

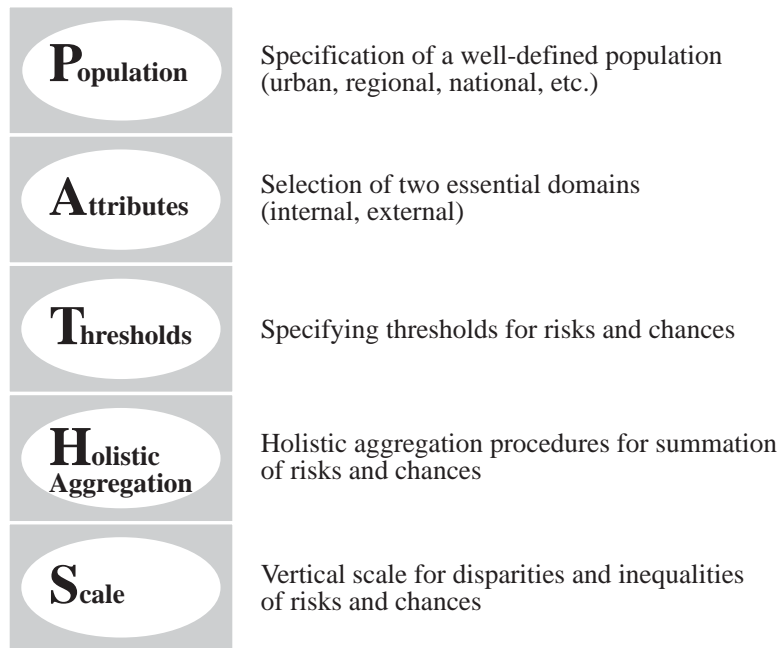
In order to provide strong empirical evidence for the three empirical claims, the comprehensive EUROMODULE-data-set with five different European countries, two of them EU-members (Germany, Spain), two of them accession countries (Hungary and Slovenia) as well as a highly advanced neutral country outside the EU (Switzerland) has been selected. In doing so, the three alternative hypotheses proposed above would have to be highly robust in nature since the economic, cultural or institutional differences between these five countries are even at first sight considerable.

Initially however, a unified framework on living conditions and risks has to be built up. In order to achieve this goal, five analytical steps must be performed which have been summarized by Diagram 3.

Following Diagram 3, the first step, namely the specification of a well-defined population, has been accomplished already since five populations from five countries have been selected.

The second step requires the construction of a comprehensive set of indicators which capture multi-dimensional living conditions across a wide range of domains. Here, Table 4 gives a summary of the fourteen socio-economic dimensions chosen. From Table 4 one can see that the socio-economic dimensions have been clustered into two main groups, namely into a first set which reflects both available socio-economic resources (income, education) or living conditions (number of rooms, actual living standards) and into a second group which is focused on the internal domain of cognitive-emotional organization in general and on specific self-evaluations in particular.¹⁵

Diagram 3: Five Steps towards Combining Multi-Dimensional Living Conditions, Socio-Economic Risks and Inequality



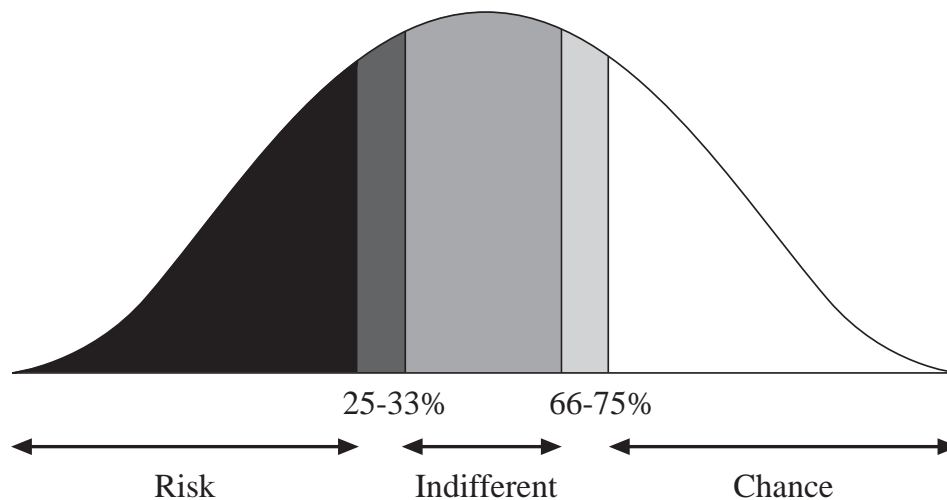
¹⁵ At this point it should be noted that a highly promising interface domain is opened up, linking social survey research with the broad arenas of the cognitive sciences or artificial intelligence. More specifically, the internal cognitive-emotional organization of actors could and should be operationalized as an inter-disciplinary effort between cognitive scientists and survey researchers. For a selection of potentially relevant literature, see for example Damasio 1994/1999, Dennett 1986/1991, Hofstadter 1982, Hofstadter/Dennett 1982, Hofstadter 1985, Maturana/Varela 1987, Minsky 1991 or Nørretanders 1998.

As third step along the PATHS-line, the concept of socio-economic risks has to be introduced and specific risk-thresholds have to be specified. This move has been accomplished basically in two stages which can be visualized with the help of Diagram 4.¹⁶

On the one hand, the fourteen essential socio-economic dimensions in Table 4 have been subdivided into three different segments, namely into a risk-segment, an intermediate segment and, finally, into a segment of life-chances. On the other hand, the lowest 25 to 33% of a population in a specific dimension have been defined as being at a socio-economic risk, the upper 25 to 33% of a population as being in a life chance position, while the intermediate group has been characterized as being in an indifference position.

It should be added that these specific thresholds for socio-economic risks and life chances have been selected for each of the fourteen dimensions as well as for the five EUROMODULE-countries separately. Thus, the distribution of the Hungarian or German population in areas like income, education, or anomia determined the choice of the specific risk and chance thresholds in each country. In this way it has been guaranteed that different levels of risk-thresholds have been generated for each country which, in turn, can be compared separately and may give rise to a rather illuminating comparative study of being at socio-economic risk in specific socio-economic dimensions across various parts of Europe.

Diagram 4 The Specification of Socio-Economic Risks and Life Chances



¹⁶ For a summary, see Müller/Link 1997, Müller 1998 or Müller 2002.

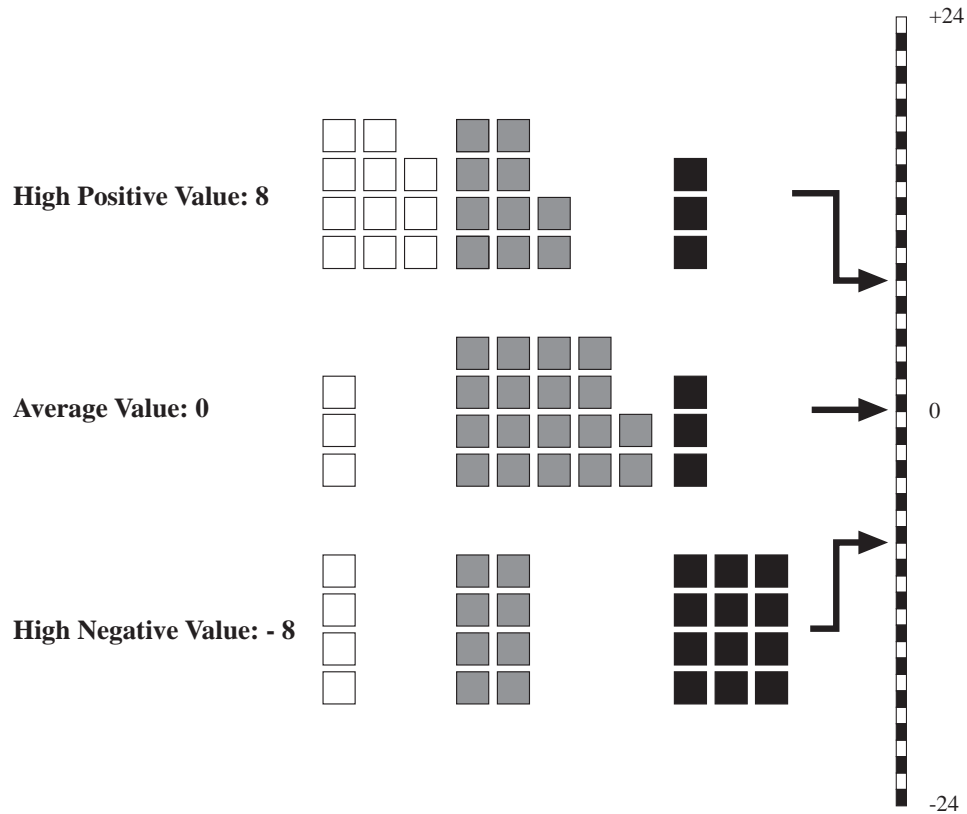
Table 4 Twelve Dimensions for Socio-Economic Risks and Chances in the EURO-MODULE¹⁷

DIMENSIONS	ACTOR-DOMAIN		
	RISK	INDIFFERENCE	CHANCE
Household Income	Low	Medium	High
Educational Degree	Low	Medium	High
Income Changes to Last Year	Low	Medium	High
Make Ends Meet	Low	Medium	High
No Influence (Anomia I)	High	Medium	Low
Loneliness (Anomia II)	High	Medium	Low

DIMENSIONS	SETTING-DOMAIN		
	RISK	INDIFFERENCE	CHANCE
Number of Rooms	Low	Medium	High
Actual Living Standards	Low	Medium	High
Missing Living Standards	High	Medium	Low
Social Networks	Low	Medium	High
Public Safety	Low	Medium	High
Environmental Complaints	Low	Medium	High

¹⁷ More specifically, the following variables have been selected from the EUROMODULE data-base: V1, V4, [V13, V14], V21, V24, V26, V27, V33, V34, V40, V49, V52, V54, V55a plus the degree of education.

Diagram 5 The Transformation of Risks and Life-Chances into a New Scale



As a fourth step along the PATHS-Diagram, all risks and life chances must be aggregated which has been accomplished in a holistic mode¹⁸ of summation and subtraction. More specifically, for each survey-respondent, the total number of risks has been subtracted from the total number of life-chances. In the case of a large sum of life chances, subtracting a comparatively small number of risks generates a relatively high positive value. Otherwise, a large total of socio-economic risks, subtracted from a small sum of life-chances, must result in a negative value. In this manner, a new risk/chance-based indicator has been calculated for each survey respondent in each of the five countries of the EUROMODULE-data set.¹⁹

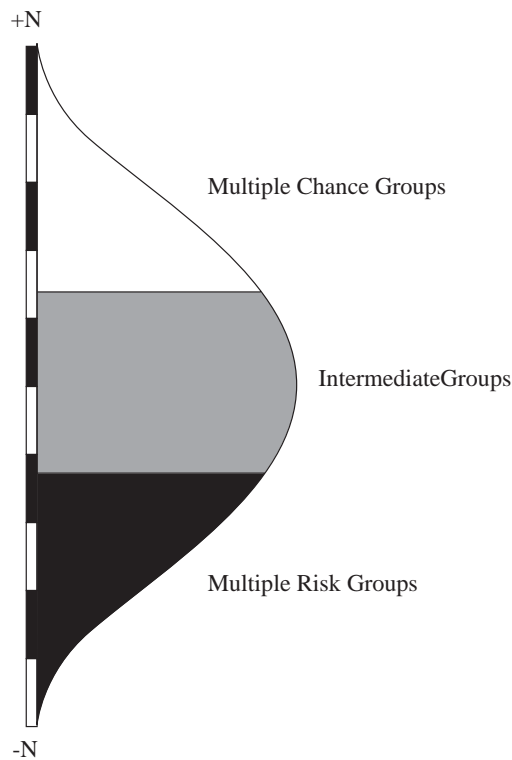
¹⁸ This specific form of aggregation is based on insights by Otto Neurath (1971/1981) into the need for comparing overall distributions and sums and not their constituent parts and elements.

¹⁹ Given the fourteen dimensions of the EUROMODULE data set, respondents may have distributions like the following ones:

Respondent A: 7 risk positions, 5 indifference positions 2 chance positions → -5

Finally, a new risk-chance based scale has been introduced which depends crucially on the total number of socio-economic dimensions selected as essential actor attributes. In general, N different socio-economic dimensions lead to a new risk/chance based scale which has its lower end-point at $-N$ (maximum number of risks, no single life chance) and its upper end-point at $+N$ (maximum value of life chances, no single risk). In the case of Diagram 5, the scale has a range from -24 to $+24$, in the case of the EUROMODULE-data, the scale goes from -12 (maximum number of socio-economic risks) to $+12$ (maximum number of socio-economic life chances).²⁰

Diagram 6 The Normal Distribution of Risks and Life Chances within a Society

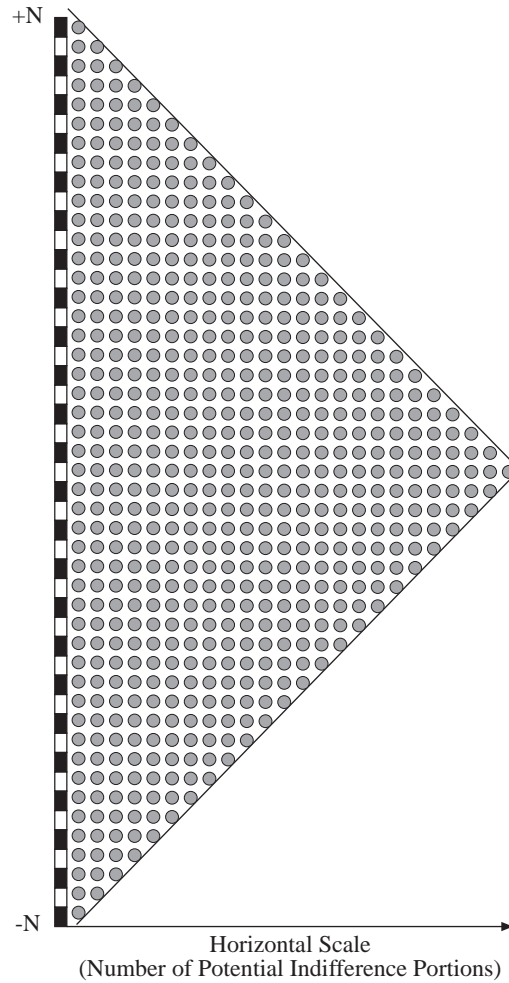


Respondent B: 5 risk positions, 4 indifference positions 5 chance positions $\rightarrow 0$
 Respondent C: 2 risk positions, 5 indifference positions 7 chance positions $\rightarrow +5$

²⁰ It should be added that the new scale can be interpreted in terms of social exclusion/inclusion as well since the lower region of unspecific risk-accumulation can be clearly associated with social exclusion whereas the upper region of the scale is a good indication for social inclusion. (On the exclusion/inclusion literature, see, for example, Levitas 1998, Nolan/Whelan 1996, Room 1995, Silver 1994 or Townsend 1979) For similar ideas of linking poverty with an accumulated set of different indicators, see Habich 1994, Habich/Krause 1994, Habich 1996.

For the subsequent empirical analysis, two large societal segments have been selected, one group of multiple risks with an accumulated risk value of -4 and lower and one group of multiple life-chances with an accumulated value of life chances of $+4$ and higher.²¹

Diagram 7 The Specification of Socio-Economic Risks and Life Chances



²¹ To be more precise, risks and chances as well as risk groups and chance groups have been constructed for each of the five countries separately and independently. For comparative analysis though, multiple risk groups with an overall value of -4 and lower have been selected. As a consequence, countries with a high concentration around the mean value of zero like Switzerland have a relatively small number of persons with an overall value of -4 and less whereas countries like Hungary and Slovenia with a flat distribution have a larger number of persons with an overall value of -4 and less.

3 The Socio-Demographic Profile of Multiple Risk Groups and Groups with Multiple Life Chances: Establishing a New Basis for Multi-Dimensional Living Conditions, Socio-Economic Risks and Inequality

The first major point which has to be established lies in the successful integration between multi-dimensional living conditions and socio-economic risks and life-chances with inequality. Put in a brief fashion, does the new risk-chance-based scale measure social inequality at all? In order to answer this question, the new scale should be able to fulfill four basic requirements.

- First, the risk/chance-based scale should exhibit a significantly positive correlation with qualifications. Low degrees of education should be accompanied by a high accumulation of multiple risks and high degrees of education should go hand in hand with high concentrations of multiple life chances.
- Second, the risk/chance-based scale has to be significantly related with income. Low income levels should be associated with high multiple risk values and high income standards high values of multiple life chances.
- Third, the risk/chance-based scale should show a clear gender asymmetry. In short, the female population should be over-represented in the multiple risk segment and under-represented in the groups of multiple life-chances.
- Fourth, age should not be related with the distribution of multiple risk-groups in a strong positive manner. The main reason for this requirement has to do with the subsequent inclusion of health conditions. Since the state of health is very powerfully linked with increasing age, it would, thus, reduce the cognitive value of a high correlation between the new risk/chance scale and health substantially.

Given this short list of four essential inequality requirements for the new risk-chance-based scale, the following series of Diagrams (Diagram 8 to 11) provides clear graphical answers to each of these conditions.

First, Diagram 8 shows that the new vertical scale fulfils the conventional criteria for identifying inequality in the domain of education. Risk-accumulation is directly related with low degrees of education whereas a high concentration of life chances is to be found within the highly qualified societal strata only.

Diagram 8 The New Risk/Chance-Scale and Degrees of Education

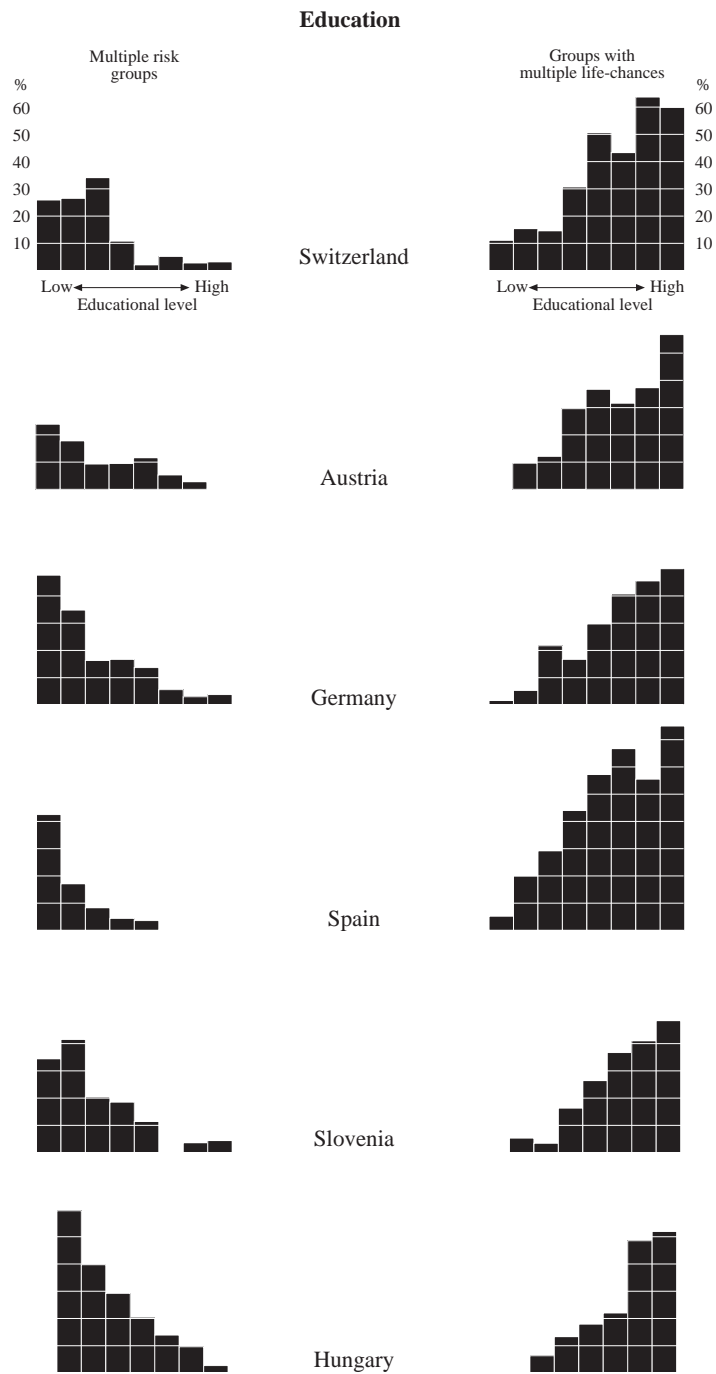


Diagram 9 The New Risk/Chance-Scale and Household Income

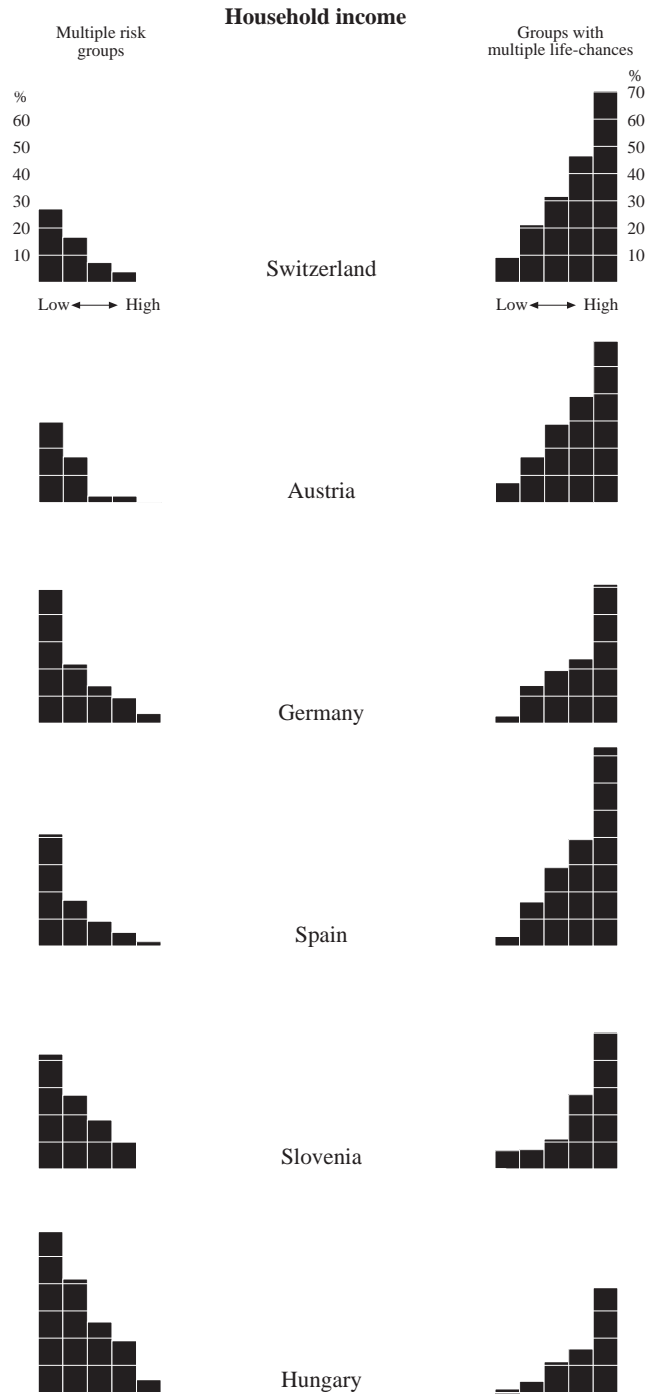


Diagram 10 The New Risk/Chance-Scale and Gender-Asymmetries

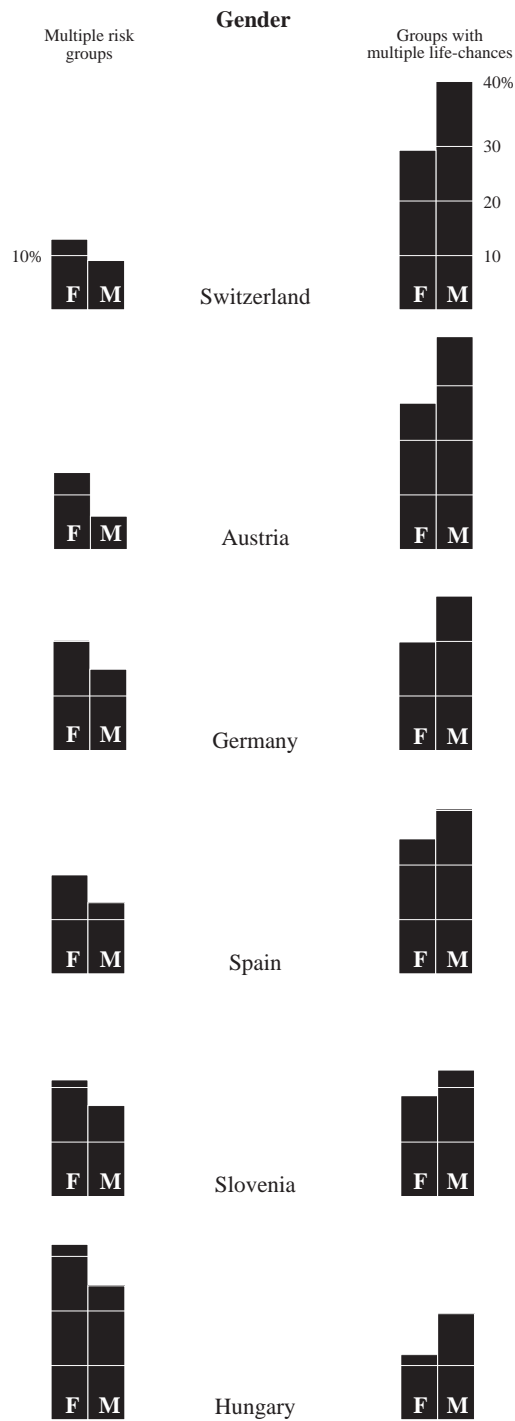
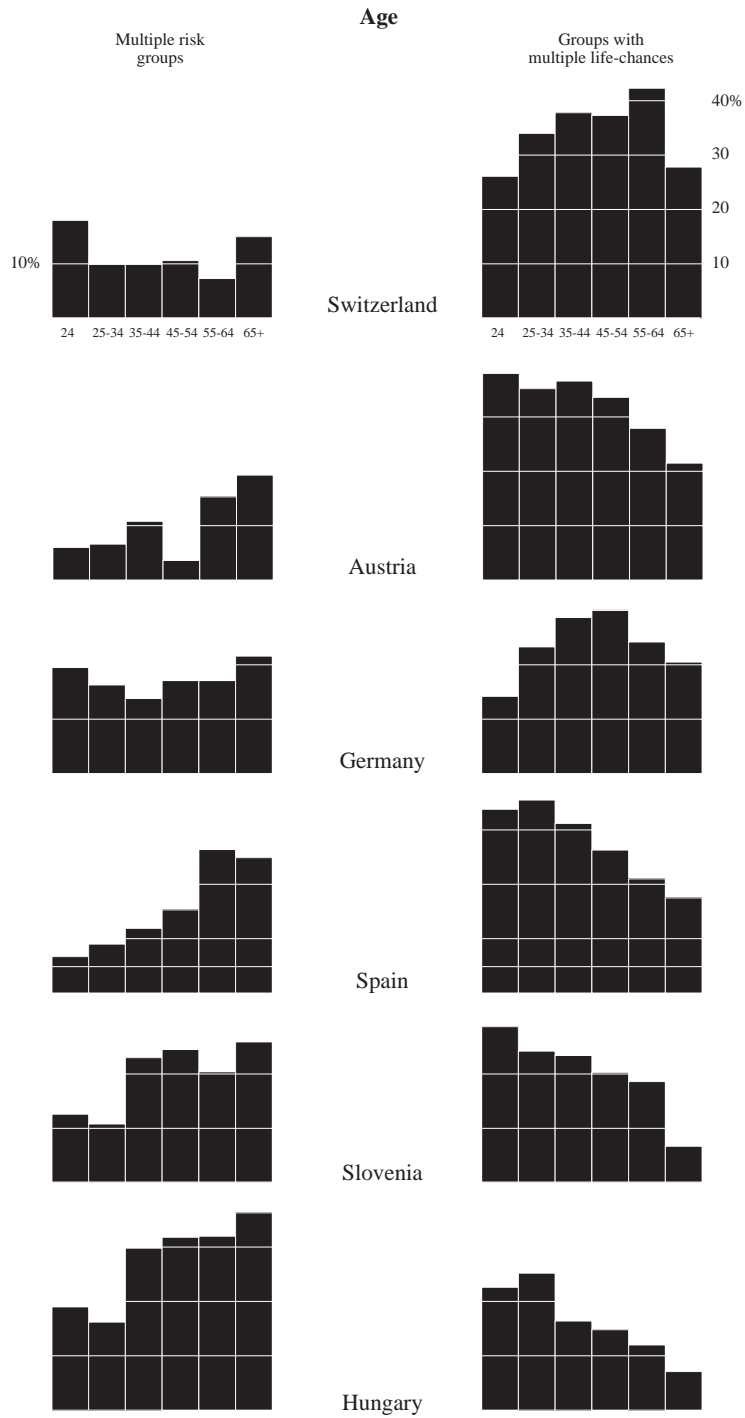


Diagram 11 The New Risk/Chance-Scale and Age-Distributions



Second, individuals with lower incomes are, as can be seen in Diagram 9, highly concentrated among the multiple risk groups. Across all five countries, income seems to be linearly related with risk and life chances, with positive slopes for the relation between income and life chances and with negative slopes for the income-risk relationship.

Third, the gender distribution along the scale of multiple risk and multiple life chances reconfirms older as well as recent studies which emphasize a deep-seated gender divide within contemporary societies. More specifically, the investigations conducted so far indicate a significantly higher concentration for women at the lower end of the scale and a somewhat weaker predominance of men on the upper end of the scale. In numbers, the ten to twenty percent of a population with the highest degree of multiple risks exhibits in general a gender distribution of 2:1. In other words, two thirds of a population with the highest accumulation of unspecific risks is female. (See also Diagram 10)

Fourth, the age distribution of the population of multiple risks and multiple chances may seem surprising at first sight since, according to Diagram 11, there is a marked tendency for weak linkages between multiple risk-formations and younger age cohorts in Switzerland and Germany and a converse pattern, namely a linkage between multiple-risk accumulation and older cohorts in Austria, Spain, Slovenia and Hungary.

In sum, the new risk/chance-based scale fulfills all four essential requirements for an appropriate measure of societal inequality which have been laid out at the beginning of this chapter.

4 The New Links between Multi-Dimensional Living Conditions, Socio-Economic Risks, Inequality, Life Satisfaction and Health

With the new platform on multi-dimensional living conditions, socio-economic risks and inequality it remains still open and undecided at this stage whether the last of the eight guiding assumptions introduced at the beginning can be refuted and replaced. The eighth assumption has stated, once again, that the course of (post)modernization produces a pattern of growing independence between overall self-assessments, health and the cognitive-emotional organization of actors on the one hand and their multi-dimensional living conditions on the other hand. After all, this guiding assumption could be supported, in principle, with large quantities of contemporary research on values, happiness or subjective well-being as well. (See, for example, Zapf 1994)

Fortunately, the new risk-approach offers a high “value added” by establishing much closer links between overall life satisfaction or health on

the one hand and the position on the risk/chance scale on the other hand. Figure 12 highlights this result by showing that the correlations between the new vertical risk/chance measure and the personal status of health, expressed in the ten point scale of satisfaction with health, are considerably higher than the conventional picture of Diagram 1. Apparently, the new perspective on evolutionary risks opens up new and surprisingly dense linkages with the status of personal health as well irrespective of the increasing complexities of post-industrial or, alternatively, of postmodern lives. Moreover, Diagram 12 exhibits surprisingly strong linkages between the new risk/chance based scale and overall life satisfaction.

The results so far suggest that under the heading of evolutionary risk-research a new and powerful perspective on the strong links between living conditions, socio-economic risks, social inequality and health has been established. It should become a valuable strategy to apply the new research tool, on the one hand, to the large quantities of available social health survey data both for highly developed as well as for developing regions and nations across the globe and, on the other hand, to all socio-economic domains in which population of actors and their essential attributes become the key determinants for their overall evolution.²²

Towards the end of the present article few brief hints will be given which will support the closer empirical linkages between multi-dimensional living conditions, risks, inequality and health from a medical and physiological point of view. In brief, it will be shown that one can find a common deep-level language through which the domains of living condition, risks and health become connected in a direct and immediate fashion. Surprisingly, the common deep level description is provided by the language of stressors and, thus, by neuroimmunology. As a starting point, it turns out to be useful to start with a taxonomy of different types of stressors which have been catalogued within the relevant body of literature²³. Here, one finds a heterogeneous set, comprised of sensory stressors (strong light, noise, sensory deprivation, etc.), block-stressors (preventing essential routines like eating, sleeping, social contacts, etc.), achievement stressors (tests, examinations, work-tasks, but also monotony at work, etc.), social stressors (large crowd of people, loneliness, isolation, etc.), environmental stressors (noise, pollution, toxic materials, etc.), decision-based stressors (goal

²² It should be added that this new evolutionary risk-approach has been applied successfully to the organizational domain, in particular to a population of scientific institutes in Austria. (See Müller *et al.* 2002) Due to the importance of populations, the new risk-framework can be easily recombined with the existing literature on organizational ecology (See, for example, Carroll/Hannan 2000, Aldrich 1999)

²³ See on this point see Cooper 1996, Horwitz/Scheid 1999, or Sarafino (2002).

conflicts, quick decisions, but also lack of decision-making, etc.) or future-based stressors (fear, anxiety of the future, etc.)

Seemingly, the heterogeneity of stressors is accompanied by a heterogeneity of stress reactions which vary in time (minutes, hours, days, weeks ...), in intensity or in emotions, associated with each stress reaction. Nevertheless, common to all these stress reactions is an attempt to reduce the discrepancy between the effects of stressors and internal target values. Moreover, all stress reactions involve the activation of the hypothalamus-pituitary-adrenal axis and produce comparatively high quantities of endocrine hormones, particularly corticosteroids with cortisol as the most important one and catecholamines. Likewise, all physiological reactions to stress manifest themselves in a broad range of measurable changes like in the higher production of stress hormones, already mentioned, but also in higher degrees of blood pressure, heart rate, respiration rate, galvanic skin responses or in larger amounts of free fat acids.

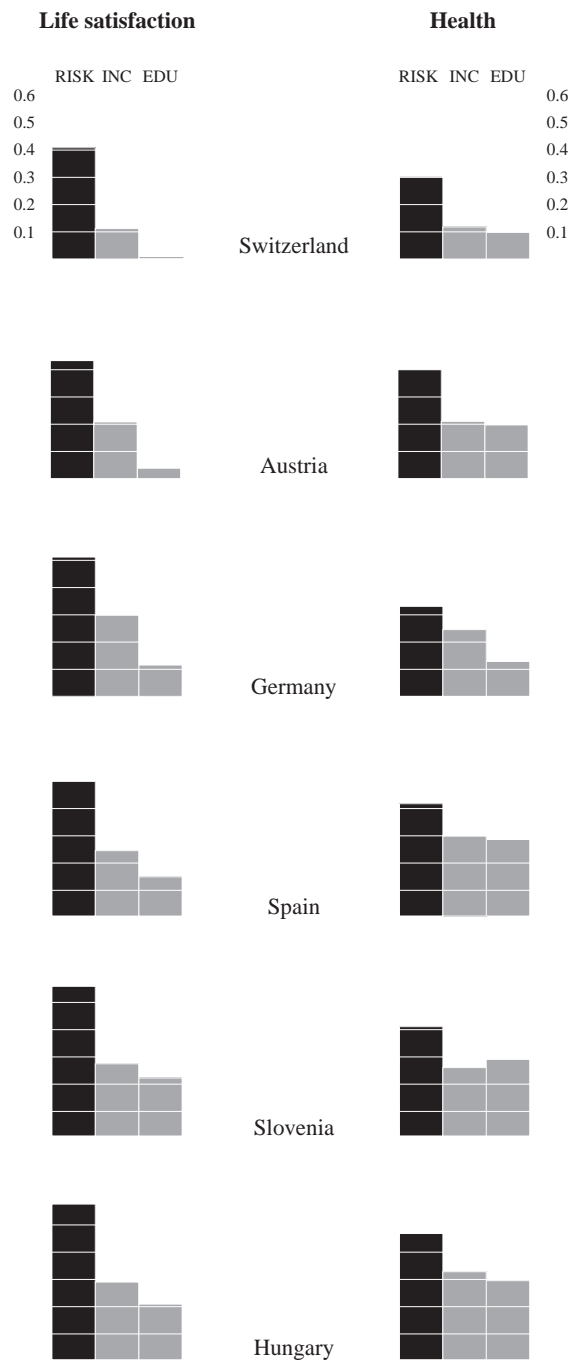
The upshot of the argument of a common general pattern of stress responses with a high degree of variation in its manifestations (duration, intensity, emotions, etc.) lies in the fact that the general pattern of stress responses possesses at least two main connections to the domain of sickness and ailments, namely through their direct effects on the cardiovascular system on the one hand and through their immediate impact on the immune system on the other hand.

Given the short background on stress-research, it seems possible to link the list of socio-economic risks which have been defined in the course of the present article to special classes of stressors like social, environmental, future-based or decision-based stressors. Moreover, the following subset-relation will be proposed:

$$\text{Socio-economic Risks} \subset \text{Stressors}$$

It is quite obvious that this subset-relationship needs a very detailed justification which cannot be provided within the framework of the present article. Five main arguments will be provided, however, which should give the bold conjecture of a risk-stressor subsumption considerable initial plausibility.

Diagram 12 The New Linkages between Socio-Economic Risks, Inequality and Health



- First, the socio-economic risks, which have been introduced on the basis of a wide array of living conditions, are characterized, *inter alia*, by their permanence. Thus, many of the socio-economic risks defined within the EUROMODULE context like low, insufficient or deteriorating incomes or low degrees of qualifications are to be classified as long-lasting or, like in the case of low qualifications, as (nearly) permanent. Thus, socio-economic risks would act as continuous stressors and not as single, rare or isolated occurrences.
- Second, there exists a remarkable asymmetry between the language of socio-economic risks and life chances on the one hand and the physiological stress language on the other hand. While risk and chances have been introduced symmetrically, no symmetry can be identified for the stress domains. Feeling unsafe in the public sphere (socio-economic risk=stressor) does not have a life chance corollary in terms of stressors. Feeling safe in the public domain does not constitute an alternative source for stressors. Likewise, a noisy environment at the workplace or at home implies an essential socio-economic risk and at the same time an environmental stressor whereas a quiet atmosphere at work or at home cannot be associated with a different group of stressors. Thus, socio-economic risks can be linked to stressors, socio-economic life-chances imply, by and large, the absence of stressors.
- Third, the distribution-dependent specification for thresholds of socio-economic risks provides additional support for the subset relationship between socio-economic risks and stressors. Since the majority of the population is, by definitional necessity, above the risk-threshold, individual actors, falling under a specific risk-segment, perceive themselves relatively deprived. Thus, the available literature on the importance of relative deprivation²⁴ can be added as further evidence for the proposed risk-stress linkages.
- Fourth, while stress reactions vary in length, intensity and emotional involvement, the basic physiological reaction patterns are unspecific with respect to the sources of stress. In other words, one does not find a “bad boss-stress reaction”, confined to a specific region in the neuro-immune system in contrast to a “loud noise-stress reaction”, affecting other parts of the neuro-immune system. Thus, a multi-dimensional array of essential living conditions across the contexts or settings of actors and across their cognitive-emotional organization can be interpreted as a summary of all relevant potential

²⁴ On this literature, see more recently Walker/Pettigrew 1984 or Olson/Hafer 1996.

stressors whose scope and degree of completeness is limited by the restrictions inherent in conventional survey research only.

- Fifth, stressors and stress reaction are clearly not invariant to the actual number of stressors since stress reactions are functionally related, probably in a complex and non-linear manner, to the overall number of stressors. This, in turn, provides additional support why the new risk-chance based scale should be interpretable in terms of a net value for the overall number of stressors.

In this way, a new approach for integrating multi-dimensional living conditions, socio-economic risks, social inequality and health has been built up which, towards the end, was even able to point to a considerably deeper description-level for these four domains, namely to the physiological description level of stressors and stress reactions.

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Socio-economic Risk-Analysis and Organizations: Results from a Survey of Scientific Institutes

Karl H. Müller

Summary

The subsequent summary consists of an extension of the new type of socio-economic risk-analysis into the domain of organizational studies. More specifically, the new risk-approach has been applied to survey data from scientific institutes in Austria.

Structure of the Survey for Scientific Institutes

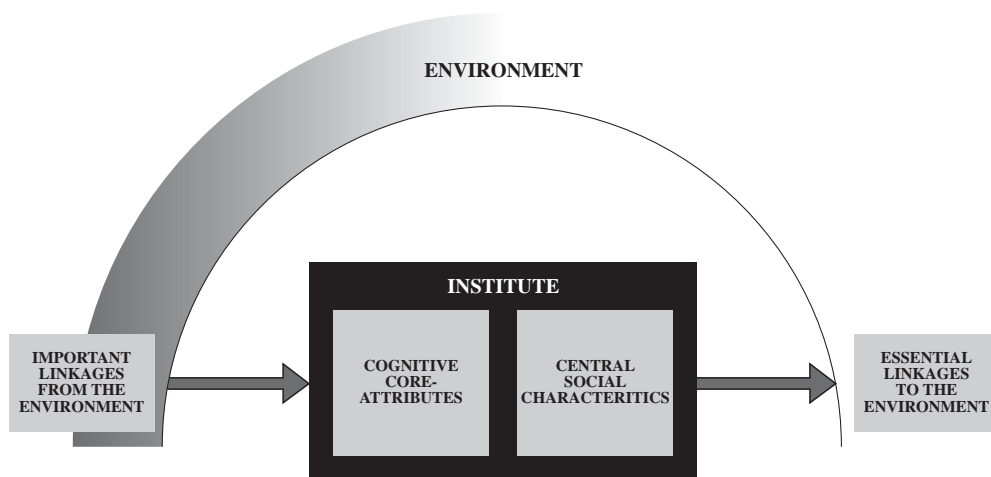
Information on:

- Basic Organizational Structure
- Organizational Culture (Participation, Restrictions, Social Interactions)
- Cognitive Organization
- Cognitive Outputs
- Internal Patterns of Cooperation (within the Science Arena)
- External Patterns of Cooperation (with the Arena outside Science (State, Media, General Public))
- Self-Assessments

N = 300

All Scientific Disciplines

Design of the Study: The Search for Key-Factors of High Performance and High Degrees of Innovations



New Alternative: Towards an Evolutionary Concept of Risks, Including Organizational Risks

Basic Requirements:

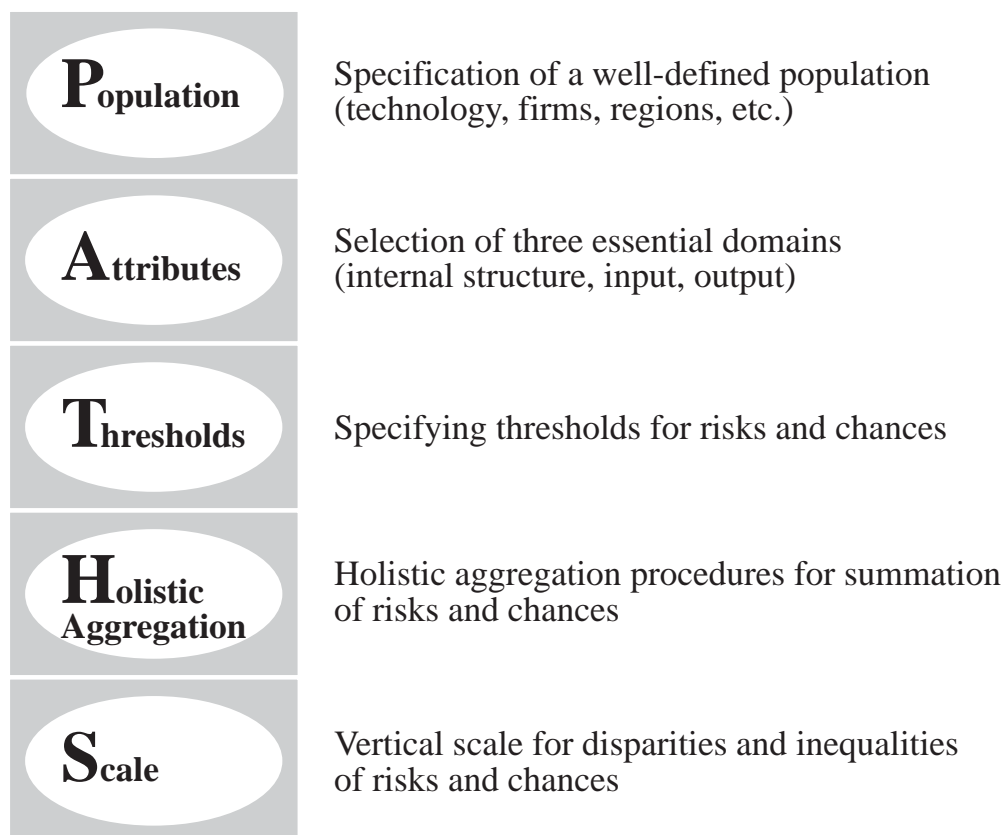
- Applicable across Low, Medium and High Technologies, Decisions, Living Conditions, Socio-Economic Domains, etc.

- Ex post and ex ante-Utilization

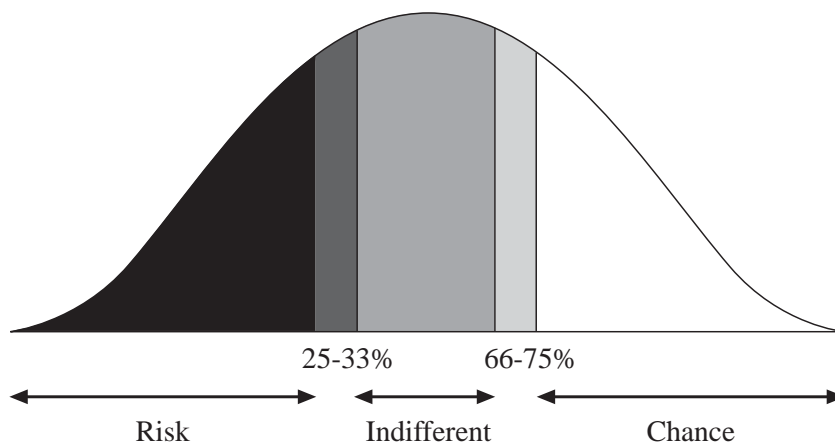
- Measurable and Quantifiable

- Linkages between Organizational Risks and Organizational Performances

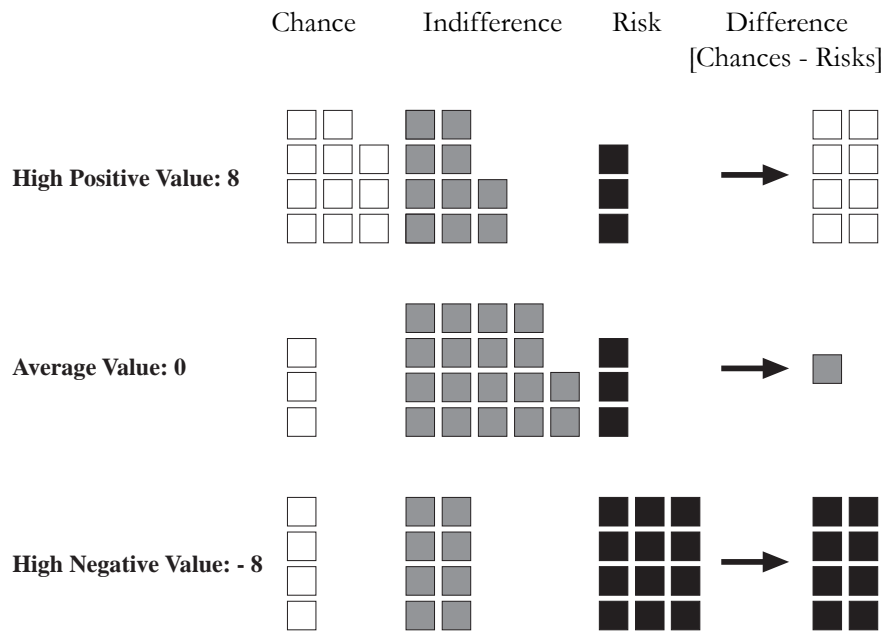
Five Steps towards a New Risk-Based Scale for Organizational Inequalities



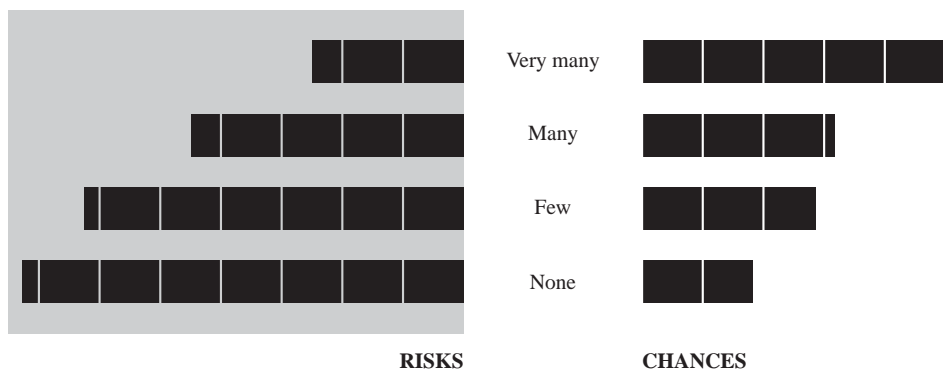
Specification for Organizational Risks and Chances



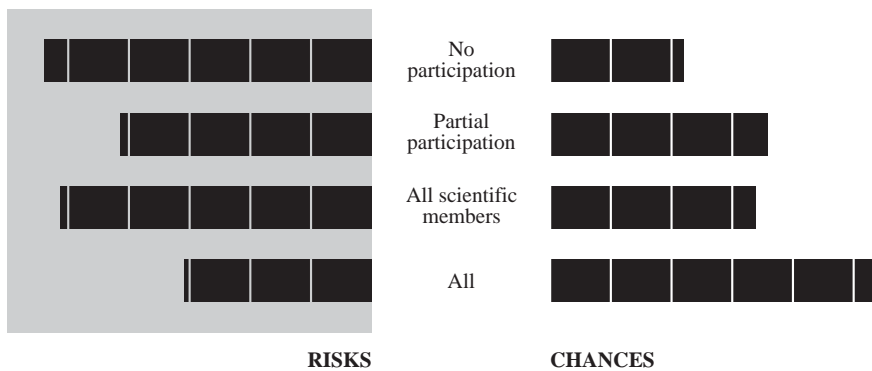
A New Aggregation Procedure (Postmodern Organizational Condition)



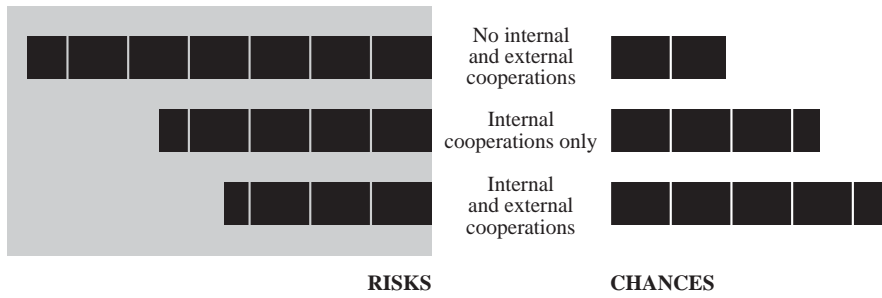
Results from Organizational Risk-Analysis: Linkages between Basic Research and Applied Research



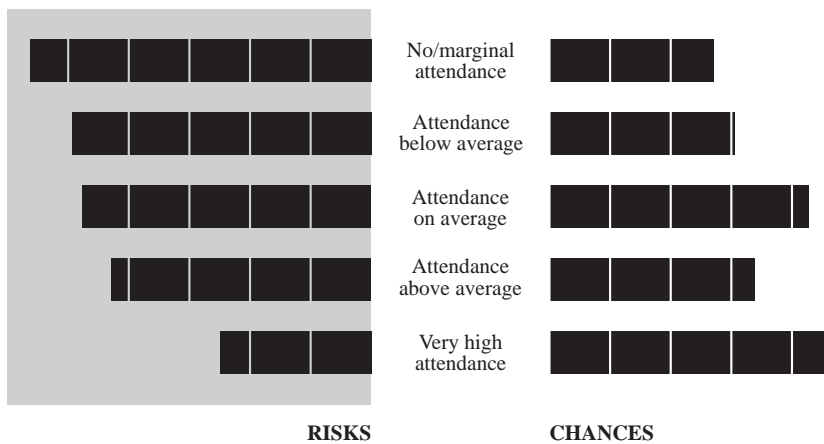
Participation in Decision Making



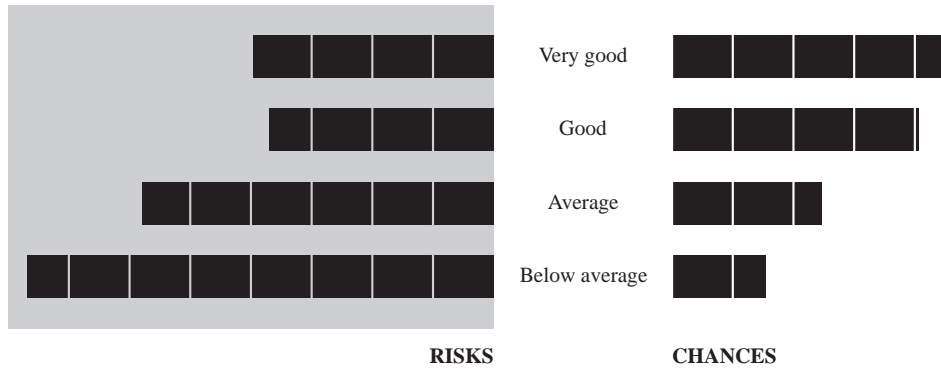
Forms of Internal and External Co-operation



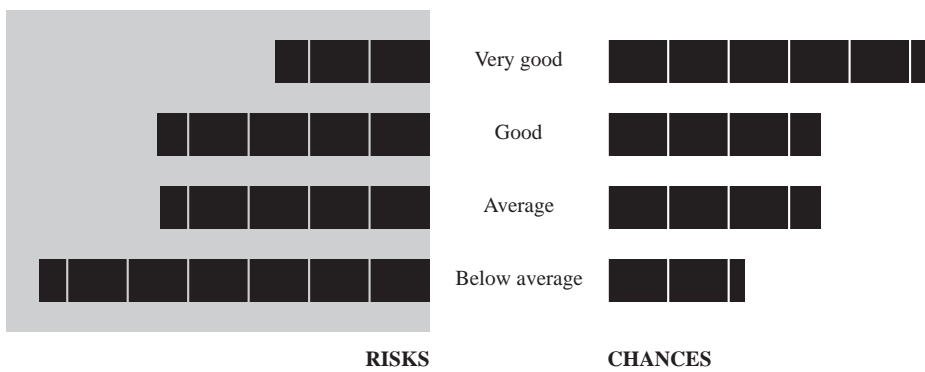
Participation in Conferences



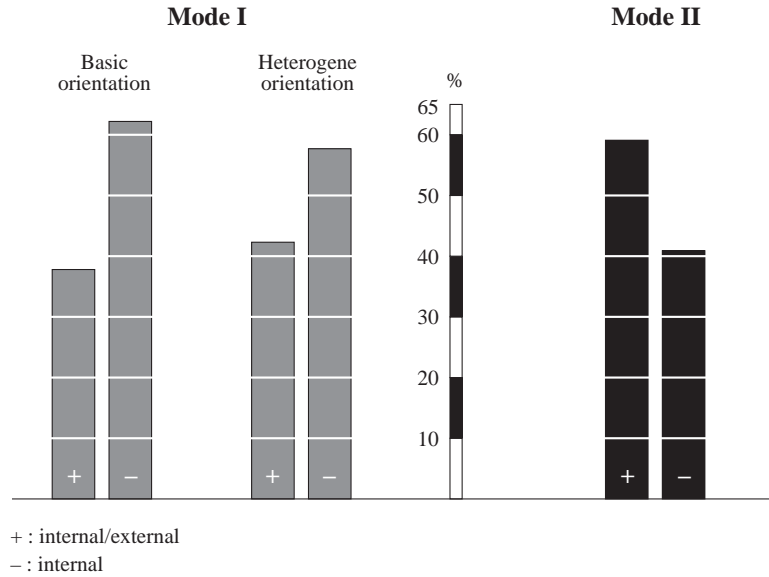
Overall Self-Assessment within the National Context



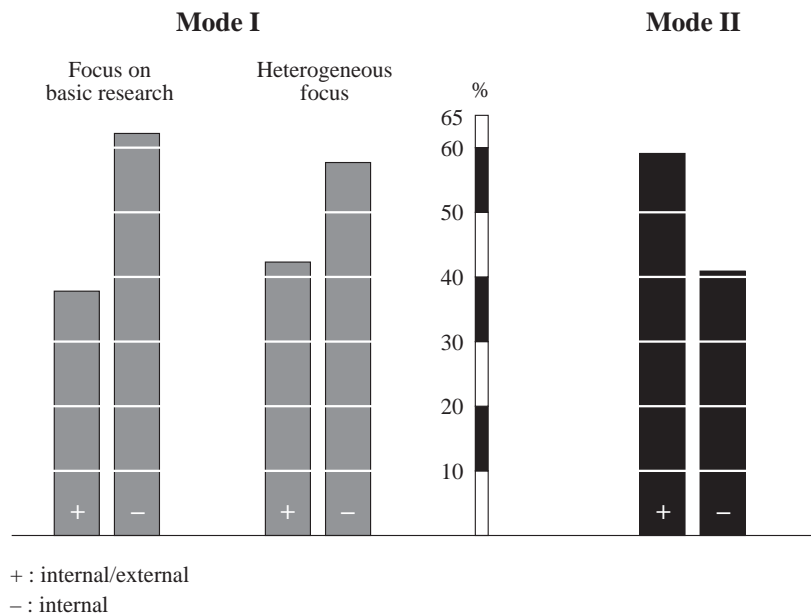
Overall Self-Assessments within the International Context



Mode I and Mode II-Organization Forms of Co-operation



Linkages between Basic Research and Applied Research



Overall Self-Assessments

