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**Food-related life style:
Development of a cross-culturally
valid instrument for market
surveillance**

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Executive Summary

1. Surveying end users is a major component of market surveillance in the food industry. End users' value perception is the final determinant of how all other actors in the food chain can make a living. To perceive trends that affect how consumers value food products is therefore an important input to a food producer's strategy formation.
2. Life style measurement has been widely used in marketing, namely for guiding advertising strategy, segmentation, and product development. Life style is potentially a valuable tool for market surveillance.
3. Life style studies as they are currently done in market research have been criticized on several grounds: they lack a theoretical foundation, they lack cross-cultural validity, their ability to predict behaviour is limited, and the derivation of so-called basic life style dimensions is unclear.
4. We propose an instrument called food-related life style that avoids these problems and is geared towards market surveillance in the food industry. It is rooted in the cognitive approach to explain human behaviour, and the main assertion is that life style is how consumers mentally link products to the attainment of life values.
5. Food-related life style has five components: higher-order attributes of food products, consequences of using food products, shopping scripts, meal preparation scripts, and usage situations.
6. An exploratory study carried out in Denmark, France, and England led to the identification of 21 cross-culturally valid elements of food-related life style. These are: shopping scripts - importance of product information, attitude towards advertising, joy of shopping, speciality shops, price criterion, shopping list; higher-order product attributes - health, price-quality relation, novelty, organic products; meal preparation scripts - involvement with cooking, looking after new ways, convenience, whole family, spontaneity, womens' task; usage situations - snacks versus meals, social event; desired consequences - self-fulfilment in food, security, social relationships.
7. This study resulted in a survey instrument with 63 questions, which can be used for cross-cultural market surveillance. It can be supplemented with product-specific questions, which link the life style dimensions to shopping behaviour.

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Market surveillance and market surveillance systems

In order to survive, companies interact with their environment. They procure materials, labour, and capital; they sell goods and services. These material and monetary interactions are founded on and complemented by informational interactions, which allow the company to adapt its activities to environmental conditions and to make plans for influencing the environment through strategic development. Information can therefore be a major source of competitive advantage.

Superior business performance has two immediate causes: to be able to produce goods and services in which customers see a superior value relative to price and relative to competing goods and services, and to be able to do this at low relative costs. A company with such abilities is also said to have a positional advantage. Positional advantages, in turn, depend on the company's skills and resources. On any market, some skills and resources will be more important than others in creating high perceived value and/or low relative costs (Day, 1984; Day & Wensley, 1988; K.G. Grunert, 1990a; K.G. Grunert & Baadsgaard, 1991; K.G. Grunert & Brunsø, 1993; K.G. Grunert & Ellegaard, 1993).

This view of competitive advantage suggests that questions of business strategy can be grouped into two categories. The first one refers to questions on how one should attain a positional advantage - for example, by pursuing cost leadership or differentiation strategies - and which skills and resources will be needed for doing so. The second one refers to the question on how a positional advantage is to be turned into business performance - for example, by pursuing invest, hold, or harvest strategies. Answering both sets of questions presupposes information about the market environment. The first set of questions about attaining positional advantage presupposes information about the determinants of costs and value perception. Do customers in the market perceive differences in product quality? Are these differences horizontal or vertical? Which product characteristics contribute most to value perception? Do these evaluations mirror some general trends characterising customer segments? Are customers price sensitive? What is the demand elasticity of price and quality variations, respectively? In addition, information about competitors' costs and skills and resources will be helpful. How different a product can we produce? How will our cost level be relative to that of competitors? Will our product be based on skills and resources which are idiosyncratic to the company and which competitors will therefore find difficult to emulate, or must we expect an imitation quickly? The second set of questions basically presupposes the same set of information, with more emphasis on the time perspective. How will customers' value perception and its determinants change over time? How will cost determinants change over time? In which skills and resources are competitors likely to invest? Such information will be useful in evaluating the sustainability of a present positional advantage, which, in turn, will guide decisions on whether to build, hold, or harvest a present position.

The process of collecting the type of information about the determinants of perceived customer value and costs, and about competitors' costs, skills and resources, we may call *market surveillance*. Put another way, we can say that market surveillance is concerned with collecting information about variables which will allow *inferences about the attractiveness of a company's present and future offerings*.

Every company engages, in some way or another, in market surveillance. A market surveillance *system* can be said to exist when such information is *regularly* collected by using specific *methods* or *instruments*, and when the procedures for doing this are organised in a formal set of activities (K.G. Grunert & Brunsø, 1993).

Data from three units of analysis will be necessary to cover all the areas mentioned above: customers, competitors, and the market as such. However, not any customer, competitor, or market characteristic is relevant for inclusion in a market surveillance system - it must be relatable to the attractiveness of a company's present or future offerings. This criterion can be used as a screening device for distinguishing relevant from irrelevant data.

This paper is about the development of an instrument which can be an element of a market surveillance system. Specifically, it is an instrument which provides information on the determinants of value perception of consumers or end-users, and it is developed for use in the food industry. We call it *food-related life style*, and it is an instrument which draws on and extends previous work on life style in marketing as well as newer cognitive approaches to analysing consumer behaviour like means-end chains and cognitive structure research. The instrument has been developed with the specific aim of detecting, by repeated application, long-term trends among consumers, and to be able to do so in a cross-cultural context.

We begin by arguing for the importance of analysing value perception of end-users as a part of market surveillance. We then argue for the life style concept as a possible approach to analysing consumer value perception and review and critically discuss existing life style research. We present our own concept, food-related life style, and relate it to research in cognitive psychology. Finally, we describe how we developed and tested the instrument empirically, using data from three European countries.

The need to survey end users

When discussing market surveillance with manufacturers, especially small and medium-sized ones, end-users often are named as a low-priority area. Information on the company's immediate customers, usually retail chains, is regarded as much more important and interesting (K.G. Grunert & Brunsø, 1993; K.G. Grunert, Nissen & Wildenhoff, 1993), at least among Danish companies.

The way any producer or seller can survive in a market economy is by creating goods or services in which potential customers see value. More specifically, customers have to see value in these goods or services to a degree that they will be willing to pay a price for these goods or services which is higher than the costs incurred in producing them.

This goes whenever goods or services are traded on a market. It holds for farmers selling animals to slaughterhouses, for slaughterhouses selling meat to the food industry, for the food industry selling processed meat to retailers, and for retailers selling consumer products to consumers. In each case the value perception on the buyer side determines the willingness to pay,

and the willingness to pay, in relation to the costs incurred by the seller, determines whether the seller can survive in the competition.

However, there is a basic difference between value perception on the consumer side and value perception by all other actors in this vertical chain. The value perception by all actors besides the consumers will be influenced by these actors' expectations about how the good or service bought can be incorporated into producing some other good or service which then can be sold to the subsequent actor in the vertical chain. Hence, these actors' value perception *will be influenced by their expectations about value perception of actors further down in the chain.*

For consumers, being the last actor in the vertical chain, this reasoning does not apply. Consumers' value perception is not based on expectations of adding value with regard to reselling (with a few exceptions like speculation in art or furniture), but is related to using and consuming. All the value added in the course of the vertical chain must find its correspondence in consumers' value perception and a willingness to pay what at least equals the total costs incurred by all members of the chain. In this way, consumers' value perception limits producer and seller activities at all levels: activities performed at each level, from the producer of raw material down to the retailing sector, can, in the long run, find monetary reward only to the extent that they contribute to the value consumers perceive in the final product which they find on the shelves.

This is the basic reason why an understanding of consumer value perception is important for producers and sellers at all levels. Even though consumers may not be their direct customers, consumers' perception of value in the final product sets the frame within which producers and sellers at the various levels can negotiate about their respective contributions to this value and the reward they can receive for it. Trends on consumer markets should hence be a central element of market surveillance for manufacturers of consumer goods. However, keeping track of such trends is difficult for small and medium-sized companies operating on several export markets at a time. A low-cost, cross-culturally valid instrument for measuring such trends would hence be desirable.

Life style as a possible market surveillance instrument

The concept of life style has been very popular in both academic and applied marketing research for the past 30 years. It is a natural candidate for use in market surveillance. It is an attempt to collect purchase-related, but not product-specific data about consumers. It should hence be basically suitable to detect long-term trends on consumer markets that fulfil the criterion named above: that they can be related to the attractiveness of a company's present and future offerings.

However, life style instruments have not been developed primarily for market surveillance purposes. Four main motives have driven life style research in marketing.

The first motive concerns segmentation. There is widespread agreement that demographic variables and other classical segmentation variables have become less useful in predic-

ting/explaining consumer behaviour, due to what is often called the “fragmentation” of consumer markets. This disenchantment with demographics began already in the sixties, when marketing practitioners observed that consumer behaviour differs widely within demographic segments (Hustad & Pessemier, 1972). While the effects of demographic criteria on purchase behaviour were statistically significant, the size of the effects was usually low (Hustad & Pessemier, 1974).

Secondly, while demographic segmentation criteria were mainly used for media selection, and are still indispensable for that purpose, they were of little help in designing advertising strategy and writing copy. Advertising practitioners demanded information on segments which could give more inspiration for formulating advertising messages, helping them “to know the recipient better” (Horn, 1991), and which was more reliable and valid than motivation research. Life style data, in addition to deriving segments, could be used for the development of advertising campaigns, for product positioning and repositioning by communication parameters (Wells, 1974). Only fairly recently has life style research also been used for product development.

Thirdly, the widespread discussion on the development of post-material values in Western societies, fuelled to a large extent by the work of Inglehart (1977), has directed the attention of marketing researchers towards identifying consumers to whom these post-material values apply. While Inglehart’s work has been criticised heavily also in marketing (S.C. Grunert, 1990; Silberer, 1991), it has directed renewed interest towards instruments for measuring values and life styles. This application of life style comes close to questions of market surveillance.

Finally, the discussion on the possibilities for standardisation of marketing parameters in a global marketing strategy (Buzzell, 1968; Jain, 1989) has directed interest towards the possibility of detecting global segments. Here, again, life style is proposed as a useful criterion, and international life style instruments have been developed in order to fill this demand.

The development of life style research in marketing

It is commonly agreed that the life style concept was introduced to consumer research by Lazer in 1963 (see Lazer, 1964). It gained rapidly in popularity and was usually characterised as an example for *psychographic* segmentation variables (see Wells, 1975), which was meant to say that the variable was subjective in nature (in contrast to objective segmentation criteria like demographics or rate of usage), and that it was not product specific (unlike product attitudes or preferences), but rather a general characteristic of the consumer.

Two major research traditions evolved in the seventies: The AA and the AIO approaches.

AA stands for *activities and attitudes* and was developed mainly by Hustad and Pessemier (1972, 1974). Attitudes were in the usual way defined as learned, enduring dispositions to react positively or negatively to an object or a class of objects. Activities were defined as

manifest actions. Both attitudes and activities were defined at several levels of specificity, ranging from the general over the product-specific to the brand-specific.

The AIO approach is the most well-known one. It was originally proposed by Wells and Tigert (1971) in co-operation with the Leo Burnett advertising agency. AIO stands for *activities, interests, and opinions*, which were, supplemented by demographics, regarded as the main ingredients of life styles. Reynolds and Darden (1974) defined the three components in the following way:

“An activity is a manifest action such as viewing a medium, shopping in a store, or telling a neighbour about a new service. Although these acts are usually observable, the reasons for the actions are seldom subject to direct measurement.

An interest in some object, event, or topic is the degree of excitement that accompanies both special and continuing attention to it.

An opinion is a spoken or written ‘answer’ that a person gives in response to stimulus situations in which some ‘question’ is raised. It is used to describe interpretations, expectations, and evaluations - such as beliefs about the intentions of other people, anticipations concerning future events, and appraisals of the rewarding or punishing consequences of alternative courses of action.”

Both AA and AIO followed a sequence which is still characteristic of life style research today, including the international instruments like CCA, RISC, or VALS. The research starts with the formulation of a number of Likert-type items which cover various aspects of consumer life style. Their number varies between fifty and several hundred, depending on the kind of instrument. They may cover aspects like materialism, body consciousness, fashion consciousness, price consciousness, attitude towards advertising, towards technology, towards government intervention, towards environmental control, self-consciousness, snobbism etc. According to Wells and Tigert, finding the right items is a question of “intuition, hunches, conversations with friends, other research, reading, head scratching, day dreaming, and group or individual narrative interviews” (Wells & Tigert, 1971). This is probably a good description of the item-finding process.

In the early days of life style research in marketing, these items were then cross-tabulated with variables measuring purchase behaviour, product attitudes, or media behaviour, in order to find significant relationships. With several hundreds of tables and possibly as many products, this could result in an excessive number of tables. Data reduction methods were therefore called for, and factor analysis was widely applied. More recently, multi-dimensional scaling techniques, and, inspired mainly by French work in the area, correspondence analysis has been used instead of factor analysis. Both factor analysis and correspondence analysis (which are also algebraically related) convert a set of variables into a set of underlying dimensions in such a way that the first dimension picks up most of the variance in the data, the second dimension most of the remaining variance etc. Mostly, only the first two dimensions are retained for ease of exposition.

The dimensions found are then used to define what is sometimes called an attitude map. An attitude map visualises the dimensions by relating them to the original variables, and can additionally be used to plot subgroups of respondents and product usage data. In factor analysis, this may be achieved by including the original variables as vectors, or by, for selected variables, computing the mean factor scores for respondents which score either low or high on these variables, and entering the corresponding points into the map. In multi-dimensional scaling and correspondence analysis, the original variables will automatically be placed on the map.

The dimensions found, or, alternatively, the original items, can then be used to cluster respondents, resulting in a number of “life style types”. Two examples shall be named. The widely-used American VALS instrument distinguishes *survivors, sustainers, belongers, emulators, achievers, I-am-me, experiential, societally conscious, and integrated* (Mitchell, 1983). The Danish Vilstrup institute runs a study distinguishing *critical, modern, pragmatic, moderate, careless, conservative, and modest* consumers.¹ These types are then usually characterised by their demographics, media habits, consumption patterns, etc. Often, the types are exemplified by giving them a Christian name (Christian, Peter, Eric.....) and writing little stories around them.

Criticism of life style research

The life style research instruments developed and used by most of the larger market research firms have been criticised by academic marketing scholars mostly on five grounds (e.g., Anderson & Golden, 1984; Askegaard, 1993; Banning, 1987; Lastovicka, 1982; Roos, 1986).

(i) *There is no agreement on, what life style actually means.* The term seems to defy definitional consensus. Anderson and Golden (1984), after perusing a large number of published life style studies, conclude that in most cases the term is not defined at all, and when it is defined, the definitions range from the contradictory to the trivial. It is instructive to compare one of the earliest definitions of the concept in marketing (Lazer, 1964) with the definition in one of the most up-to-date textbooks (Engel, Blackwell & Miniard, 1990):

“Life style is a systems concept. It refers to the distinctive or characteristic model of living, in its aggregative and broader sense, of a whole society or segment thereof. It is concerned with those unique ingredients or qualities which describe the style of life of some culture or group, and distinguish it from others. It embodies the patterns that develop and emerge from the dynamics of living in a society” (Lazer, 1964).

“Life styles are defined as patterns in which people live and spend time and money. They are a function of consumers’ motivations and prior learning, social class, demographics, and other variables. Life style is a summary construct reflecting the values of consumers” (Engel, Blackwell & Miniard, 1990).

There is not much progress visible between 1964 and 1990. Both definitions are excessively vague and seem to encompass most other variables otherwise used to characterise consumer behaviour.

(ii) *The methods used are purely inductive and not guided by theory.* Life styles types come about based on dimensions derived by exploratory data analysis techniques like factor analysis or correspondence analysis. These techniques are applied to sets of items, the generation of which is not theoretically guided either, but is very much based on common sense reasoning and implicit experience in carrying out market research. While such a research procedure may be appropriate in the early phase of the life cycle of a research technique, one should hope that, based on such exploratory analysis, theory should develop, which could then guide the analysis of new and better measurement instruments. Also, many feel that consumer behaviour is such a well-researched area that it should be possible to obtain some theoretical input from there that could enrich life style research.

(iii) *The derivation of the underlying dimensions is unclear and/or unsatisfactory.* Since the commercially marketed instruments, like VALS, RISC or CCA, are usually proprietary, information necessary to evaluate the statistical soundness of the derived dimensional solutions is often missing. A priori, many social science researchers tend to be suspicious when several hundred variables are reduced to just two dimensions (which is the case in many instruments). On the other hand, *if* a large part of the variance in the data can be explained by just two dimensions, it should be possible to capture these dimensions with a much simpler instrument, which would considerably reduce the cost involved in data collection.

(iv) *The explanatory value of life style types or dimensions with regard to consumer choice behaviour is low and not well documented.* Evidence supplied has been mostly in the form of cross-tabulations of life style items or types with self-reported use of or attitude towards certain products (see Wells, 1975). Also, users of a certain brand or product can be placed on the life style maps based on their mean factor scores. When it has been attempted to relate purchase data and life style data in such a way that the amount of variance in the former explained by the latter, the amount of variance explained has been very modest, sometimes even below the variance explained by demographic variables alone (Bruno & Pessemier, 1972; Wells & Tigert, 1971). As Wells puts it in a review article already in 1973: "Stated as correlation coefficients these relationships appear shockingly small - frequently in the .1 or .2 range, seldom higher than .3 or .4" (Wells, 1973). Newer studies do not show improvements in this respect (Valette-Florence, 1989, 1991; Aurifeille & Valette-Florence, 1992). It seems that life style items are especially poor when it comes to explaining consumer behaviour at brand level, while explanatory power at product category level may be a little higher (Hustad & Pessemier, 1974).

(v) *The cross-cultural validity of the international life style instruments remains to be demonstrated.* The larger pan-European life style studies like RISC and CCA provide data which aim at identifying similar life style segments across borders, and numerous other life style studies have tried to identify cultural differences in life style (e.g., Douglas & Urban, 1977; Hui et al., 1990; Laroche et al. 1990; Linton & Broadbent, 1975). Collecting data in dif-

ferent cultures with the aim of obtaining comparative results requires that the measurement instrument has cross-cultural validity, i.e., that *translation* and *measurement equivalence* are ensured or at least tested (cp. Chandran & Wiley, 1987; Green & White, 1976; Sekaran, 1983).

Whether *translation equivalence* can be achieved depends on the *conceptual, functional, and experiential equivalence* of the concepts to be translated. Conceptual equivalence presupposes that the life style aspects to be measured can be meaningfully expressed in each culture/-language which is part of the study - like, e.g., the concept of *fashion*. Functional equivalence refers to the similarities of goals of behaviour covered by the concept. Are, e.g., the societal functions of fashion the same in the cultures investigated? Experiential equivalence finally refers to the existence of equivalent referents or symbols in different cultures, like, e.g., the main symbols indicating that somebody is fashion-conscious. Only when these aspects of equivalence are met, does it become meaningful to investigate to which extent respondents across cultures differ with regard to the extent to which they endorse the concept in question, i.e., various degrees of fashion-consciousness. There is all reason to believe that such equivalence cannot be taken for granted in many studies, and this would apply all the more in such a culture-dependent area as food intake.

Measurement equivalence refers to construct operationalisation, item, and scalar equivalence. Equivalence of operationalisation presupposes that the psychological processes occurring in the respondent while answering are the same or at least to some degree comparable in the various cultures investigated, while item and scalar equivalence refer to the equivalence of response categories and metric. That the use of scales may be culture-bound has been demonstrated (Yu et al., 1990).

For the kind of data involved in life style studies, *factor invariance* is a good criterion for investigating the degree of translation and measurement equivalence actually achieved. Various degrees of factor invariance can be distinguished, corresponding to various degrees of cultural comparability (S.C. Grunert, K.G. Grunert & Kristensen, 1992). However, such investigations have not yet been reported for life style data.

The remainder of this paper will be devoted to discussing some ways towards improvement of life style research in marketing, and especially in the food sector. First, it will be noted that the life style concept actually has roots in the social sciences, which, though often ignored in marketing applications, can give inspiration for theoretical foundation. Secondly, some alternative approaches to the standard way of measuring life style will be named, and some recent improvements will be mentioned. We then proceed towards a new definition of life style and an outline of a model for life style in the context of food and drink.

Roots of the life style concept in sociology and psychology

The concept of life style can be traced to three major sources in sociology and psychology. These are the works of *Weber, Adler, and Kelly*.

In his *Wirtschaft und Gesellschaft* (1921) the sociologist Weber used the term *Stilisierung des Lebens*. Social groups differ with regard to their life style, which becomes characteristic of this group and those who wish to belong to it. The main determinants of different life styles are social class, especially education and occupation. This emphasis on socio-structural determinants of life style remained characteristic of sociological studies also later (e.g., Bourdieu, 1979; Parsons, 1970; cf. Zablocki & Kanter, 1976).

In psychology, on the other hand, life style was regarded as something idiosyncratic. In the work of Adler in the twenties, it referred to the way individuals direct their behaviour by anticipating its consequences and relating them to their personal goals (he earlier also used the term *life plan*). While Adler stressed the uniqueness of individual life styles, he also recognised similarities among individuals and their life styles (Ansbacher, 1967).

The same is true for *Kelly's theory of personal constructs* (Kelly, 1955). Kelly maintained that the way people perceive the world and relate it to themselves is mediated by a number of idiosyncratic personal constructs, which are bipolar and hierarchically ordered. They can be measured by the well-known grid method. While these constructs are idiosyncratic, they can nevertheless be used as a grouping criterion, and, since they determine how people relate to the world, they will become manifest in what can be called a life style (see also Reynolds & Darden, 1974).

These three roots of the life style concept point to three possible main elements of a life style concept. *Environmental constraints or determinants*, emphasised in sociological approaches. Mental constructs, sometimes also called *cognitive style*, which refer to the mental processes relating perceptions of the environment, individual goals and values, and intended behaviour. Finally, actual behaviour, sometimes also called *response style*.

Newer conceptualisations of life style in consumer research have become more implicit as regards the extent to which they refer to these three components. Roos (1986) explicitly defines a broad life style concept, which includes *conditions (historical and present)*, *activity*, and *consciousness*, corresponding to the three elements just named. Anderson and Golden (1984), based on their caustic review of life style research in marketing, propose to limit the use of the life style term to overt behaviour, which is to be distinguished from cognitive style, as behaviour's mental counterpart, and environmental constraints and opportunities. Their main reason for this proposal is the demonstrated non-congruence between mental states and overt behaviour.

Alternative approaches to life style research

We can now combine the brief review of life style research practice in marketing and the three major elements just described to define some alternative types of life style research.

The predominating approach in life style research in marketing can be called a *cognitive, inductive approach*. As already mentioned, the approach is inductive, because a collection of

items, which has come about with very little theoretical guidance, is subjected to exploratory data analysis techniques, resulting in life style dimensions and types. It is cognitive, because what is measured are mental constructs, and the measurement as such is made by asking respondents to complete a questionnaire. Attitudes, interests and opinions are clearly mental constructs, but it should be noted also that with regard to activities not the activities themselves are measured (although they are observable in principle). Instead, one measures self-reported activities.

A *cognitive, deductive approach* would retain the questionnaire as the basic form of operationalisation, but the dimensions to be measured would be formulated in advance, based on theory, and the suitability of questionnaire items for measuring these dimensions would be investigated by confirmatory techniques.

Figure 1. A taxonomy of life style studies

	inductive	deductive
cognitive approach	most commercially marketed instruments like VALS, CCA, RISC	the approach proposed here
manifest approach	analyses based on use of time and money, e.g., Uusitalo (1979)	e.g., Højrup's life form analysis

In a *manifest approach*, the way life style manifests itself in consumer choices, budget allocations, time use etc. would be measured. Once again we can distinguish between an inductive and a deductive mode (figure 1). Strictly manifest approaches have to be based on observation instead of questioning. In practice, a number of studies in the academic sphere have adopted a semi-manifest approach, in which the data are obtained by questioning, but the questions refer to observable variables only. Uusitalo (1979), e.g., used consumption data obtained from official statistics, from a questionnaire, and from a diary technique, and time use data, also obtained by a diary technique, and submitted these data to factor analysis, resulting in three life style dimensions. The study could be characterised as (mostly) manifest inductive. Jelsøe, Land and Lassen (1991) are underway with a study using Højrup's (1983) *life form* typology, which is based on the notion that life style, including consumption behaviour, is determined by the form of work life (conventional wage earner, career-oriented wage earner, self-employed). The approach could be characterised as semi-manifest - being self-employed or a wage earner is quite manifest, but the career orientation is measured by a few questionnaire items - and deductive, since the life form types are determined in advance on theoretical grounds.

Manifest studies have, however, been few in consumer research, compared to the dominating cognitive approach.

Recent improvements in the cognitive approach

The criticisms of the dominating cognitive inductive approach have led to a number of proposals for improvement, which can be regarded as building on each other. The first relates to sharpening the distinction between values and life styles. The second is concerned with placing the life style concept in a hierarchy of cognitive categories.

Values and life styles have originally not been distinguished in marketing research, neither at the conceptual nor the operational level. The most popular US life style instrument is actually called *Values and Life Styles (VALS)*, and makes no attempt to distinguish between the two concepts. However, value research has gained considerable momentum in recent years, also in marketing. *Rokeach's* (1973) lists of instrumental and terminal values have been invoked. As a simpler alternative to Rokeach, the *List of Values* has been developed and promoted by Kahle and his collaborators (Kahle, Beatty & Homer, 1986), and has led to several international studies (K.G. Grunert, S.C. Grunert & Beatty, 1989; S.C. Grunert, K.G. Grunert & Kristensen, 1992). As a more complex, but possibly more cross-culturally valid alternative to both Rokeach and LOV, Schwartz (Schwartz & Bilsky, 1987) has developed an instrument measuring 12 motivational domains of values, based on multiple items, which is beginning to be applied in consumer research (S.C. Grunert & Juhl, 1991).

Establishing value measurement as a distinct research tradition in consumer research could make life style research superfluous, but this has not happened, partly because attempts to relate value data directly to consumption data have not been more successful than attempts to relate life style directly to consumption data (Silberer, 1991). Instead, value research helped to bring about the idea of a hierarchy of cognitive categories. Values are commonly regarded as the most abstract types of cognitive categories, whereas product attitudes or product attribute perceptions are usually regarded as the most concrete cognitive categories related to buying behaviour. Between these two extremes, there should also be categories at an intermediate level.

This basic idea has appeared in several guises:

Lastovicka (1991) has argued that life style should be integrated into a more complete model for the prediction of behaviour; especially, the causal link may not go from life style to choice behaviour directly, but to product attitudes, which in turn may determine behaviour.

Several authors (Homer & Kahle, 1991; Schürmann, 1988; Vinson, Scott & Lamont, 1977) have argued for a value-attitude-behaviour hierarchy, in which values, as measured by LOV, would impact on product attitudes, which then influence behaviour.

In the most complete statement of such causal chains, Olson (e.g., Olson & Reynolds, 1983; Peter & Olson 1990), in his *means-end chain theory*, argues that consumer choice behaviour is triggered by how products are linked to self-relevant higher order cognitive categories in consumers' cognitive structures. As the

highest order and most self-relevant type of cognitive category, he again mentions values, but in between he distinguishes between psychosocial and functional consequences, and abstract and concrete product attributes.

The idea of a hierarchy of cognitive categories determining consumer behaviour can be taken as a starting point for a new cognitive view of the life style concept.

Towards a new concept of life style

In the following, an attempt will be made to provide a fresh approach to the life style concept in analysing consumer behaviour. The approach is cognitive, i.e., life style is regarded as a mental construct which explains, but is not identical with, actual behaviour. Thus, we adopt Anderson and Golden's criticism that it is questionable to include mental states and overt behaviour in one construct, but we draw the opposite conclusion of theirs with regard to defining life style, which has the advantage that our approach is more in accordance with the way the term is actually used in practice. We start from the idea of a hierarchy of cognitive categories and try, based on modern cognitive psychology, to develop a cognitive model which relates life style to other cognitive categories, and also how they are related to behaviour. Thus, the approach can be said to be in the Kelly tradition of defining life style as a set of mental constructs, which interrelate perceptions of the environment with goals and behaviour.

The approach proposed is based on the following general assumptions, which summarise major results from current cognitive psychology (see Anderson, 1983; K.G. Grunert, 1990b; Peter & Olson, 1990).

(i) *Human behaviour can be explained by a cognitive paradigm, i.e., by the interaction of comprehension processes, integration processes, and cognitive structure.* Cognitive structure is the organisation of knowledge in human memory. Comprehension processes refer to how information in the environment is perceived, comprehended by retrieving information from cognitive structure, and stored, thus changing developing cognitive structure. Integration processes refer to the use of stored knowledge in determining behaviour and includes processes like the formation of evaluations, attitudes, and behavioural intentions.

(ii) *Cognitive structures consist of declarative and procedural knowledge.* Declarative knowledge refers to semantic or episodic information which can be verbalised - like, e.g., information about products, about expected consequences of behaviour, about personal goals and values. Procedural knowledge refers to stored skills, motoric or perceptual, which cannot easily be verbalised.

(iii) *Declarative knowledge can be conceived as a system of cognitive categories and their associations. Cognitive categories vary in level of abstraction; associations vary in strength.* Associative networks are the most parsimonious way of modelling declarative knowledge. A cognitive category can be described as a classification of a class of objects which, for some purpose, are regarded as equivalent. Cognitive categories and their associations can be regarded as the result of life-long learning.

(iv) *Procedural knowledge can be conceived as a system of scripts.* A script is the cognitive representation of a sequence of acts, or motions, or behaviours, which is typical for a give task.

(v) *Behaviour is motivated by linking cognitive categories referring to concrete acts or objects to abstract cognitive categories referring to values.* Another way of saying this is that objects in the environment become relevant to a person only to the degree to which they are related to that person's self-concept, as mirrored in its system of goals and values.

(vi) *This linkage can be stored as a system of associations in cognitive structure, and can then influence behaviour without becoming conscious, or can be formed by conscious thought in a problem-solving situation.* Hence, while behaviour in some way will be goal-oriented or self-relevant, the way such goals direct behaviour will not necessarily be conscious to the actor. The more common a certain link between value and behaviour is to a culture, the more likely is it that such behaviour occurs without deliberate conscious reflection.

(vii) *The linkage can involve both procedural and declarative knowledge.* I.e., the way in which some object in the environment is related to self-relevant consequences may depend on motoric and/or perceptual skills.

This set of assumptions, which is in good accordance with most modern cognitive theories of consumer behaviour (e.g., K.G. Grunert, 1990b; Peter & Olson, 1990), can now be used as a basis to define consumption-related life style in a new way. It is proposed to define *consumption-related life styles as the system of cognitive categories, scripts, and their associations, which relate a set of products to a set of values.*

This proposed definitions warrant a number of comments.

(i) It makes life style distinct from values, since values are self-relevant and provide motivation, while life style links products to self-relevant consequences, i.e., values.

(ii) Life styles transcend individual brands or products, but may be specific to a product class. Thus, it makes sense to talk about a food-related life style, or a housing-related life style.

(iii) Life styles are clearly placed in a hierarchy of constructs of different levels of abstraction, where life styles have an intermediate place between values and product/brand perceptions or attitudes.

(iv) Life styles can include both factual and procedural knowledge. They include the subjective perceptions, based on information and experience, about which products contribute to the attainment of life values, but they also include learned procedures concerning how to obtain, use, or dispose of products.

(v) Life styles refer to enduring dispositions to behave, not to single behaviour acts. Life styles in the way defined, change slowly and will always frame behaviour, but any single act can always be modified at will by constructing ad hoc chains linking that act to the attainment of value(s).

An application to food products

How are food products related to values in consumers' cognitive structure? It may be possible to distinguish relevant parts or aspects of cognitive structure, which may then be the starting point for attempts to operationalise food-related life style (FRL). In figure 2, an attempt is made to delineate relevant parts of cognitive structure, and how they contribute to linking food products to values.

Food products are an especially intricate aspect of consumer behaviour. The relationship between the product and value attainment can be very indirect. The value attainment finally achieved will depend not only on the product itself, but to a large degree also on the usage situation and on the way food products are transformed into meals (Steenkamp & van Trijp, 1990). This on the one hand makes it difficult for the consumer to have his/her choice of food products directed by expected value attainment, but on the other hand gives consumers many degrees of freedom in just how they try to use food products to attain values. These degrees of freedom, put in another way, open up for the possibility of different food-related life styles.

The following areas, depicted in figure 2, can be regarded as possible *elements* of food-related life styles, because they contribute to the link between food products and values.

Shopping scripts. How do people shop for food products? Is their decision-making characterised by impulse buying, or by extensive deliberation? Do they read labels and other product information, or do they rely on the advice of experts, like friends or sales personnel? Do they shop themselves, or through other members of the family? In which shops - one-stop shopping versus speciality food shops?

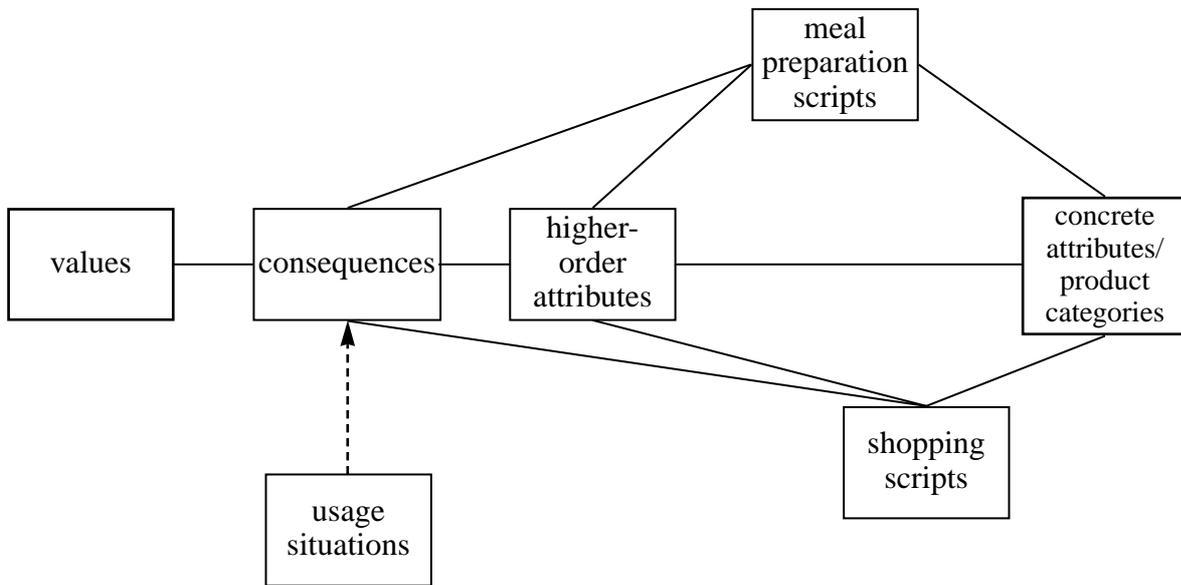
Meal preparation scripts. How are the products purchased transformed into meals? How much time is used for preparation? Is preparation characterised by efficiency, or by indulgence? Is it a social activity, or one characterised by family division of labour? To which extent does it involve technical aids? Human help? To which extent is it planned or spontaneous?

Desired higher-order product attributes. This refers not to concrete attributes of individual products, but to attributes which may apply to food products in general. Examples may be healthy, nutritious, natural, fancy, exclusive, convenient.

Desired consequences. What is expected from a meal, and what is the relative importance of these various consequences? How important is nutrition compared to the social event? How important are emotional/feeling consequences and hedonism (cf. S.C. Grunert, 1993).

Usage situations. What are "the" meals? How are they spread over the day? Which products are typical for which meals? In which environment do they take place? Is a meal perceived differently when eaten alone, rather than with the family? With friends, guests?

Figure 2. A cognitive structure model for food-related life style



Differences in life style, according to the proposed definition, are related not only to differences in importance of the various cognitive categories/scripts just mentioned. They are related to the way these cognitive categories are related to each other, and to the way they are related to products on the one side, values on the other side. Here are just a few examples:

Will there be different shopping scripts depending on which abstract attribute is in the foreground - e.g., health versus fanciness? Depending on the usage situation envisaged?

How are the consequences related to usage situations - e.g., is security more important when there are guests? Is health more important for breakfast than for dinner?

Will meal preparation scripts differ according to the desired consequences? When the nutrition consequence is primary, will the meal be prepared differently than when emotional consequences are primary?

How are the desired consequences related to values? Is meal preparation a contribution to self-fulfilment, or just to ensuring further existence?

Developing a survey instrument

We have tried to develop a survey instrument which fulfils the following criteria:

It covers the five elements of food-related life style defined above.

It taps these five elements in a cross-culturally valid way.

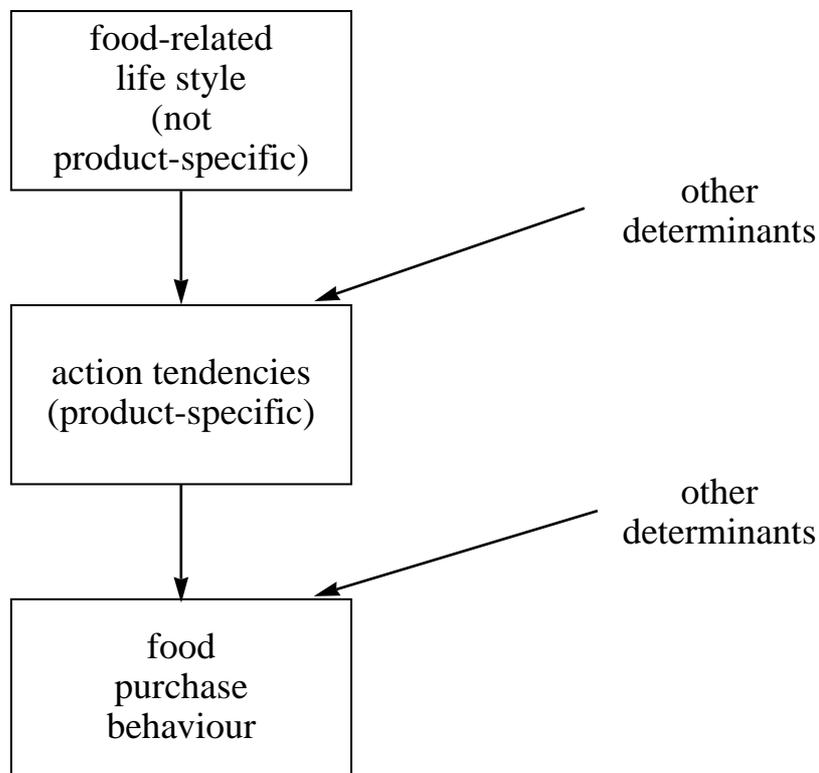
It is easy to administer and allows data collection at a cost which is considerably below that of known life style instruments.

It consists of a general, non-product specific core and product-specific supplements.

The last criterion warrants some additional comment. Cognitions within the five areas of food-related life style can again be of different levels of abstraction. *‘When shopping for food I usually go for the lowest prices’* may be a statement covering an aspect of a shopping script at the general level. It will have some predictive power for shopping for food products in general, but at the level of the individual product this power will be less, as the script will obviously apply in varying degrees to various types of food products. A statement like *‘When shopping for meat I usually go for the lowest prices’* will have higher predictive power for that product category. In turn, a consumer endorsing the abstract statement will be more likely to endorse the product-level statement.

We therefore assume a causal model like in figure 3: Food-related life style determines, along with other factors, product specific action tendencies, which in turn determine action.

Figure 3. Food-related life style, action tendencies, and behaviour



This has a practical side as well. The core instrument, measuring food-related life style, is of potential interest to a wide audience in industry and can be subscribed to on a shared-cost basis. By supplementing it with product-specific action tendencies, individual companies can, at comparatively low cost, obtain a powerful instrument for market surveillance of their specific product markets.

The empirical research described in the following relates only to the development of the core instrument. It was felt that the development of a cross-culturally valid core instrument has to precede attempts to relate this instrument to buying behaviour by means of action tendencies.

Development of the core instrument proceeded in the following steps:

1. Generation of a pool of items covering the five elements of food-related life styles based on the theoretical foundation.
2. Collection of data, using the item pool, in three European countries.
3. Exploratory factor analysis, within each of the five elements, and separately for each country.
4. Search for factors which seem to be stable across the three samples.
5. Construction of scales for each of the remaining factors. Analysis of scale reliability across and within samples. Modification of scales with the aim to retain three items per scale.
6. Testing the set of cross-cultural factors by confirmatory factor analysis.
7. Investigation of intercorrelation between the scales.
8. Assessment of construct validity by looking at differences in food-related life style between the three samples.

Generation of item pool

202 Likert-type items were constructed which were supposed to cover the five elements of food-related life style defined above (Shopping scripts, desired higher-order product attributes, meal preparation scripts, usage situations, and desired consequences). Inspiration for formulating these items was drawn from the food choice literature, food journals, women's magazines, and earlier life style studies like RISC. Agreement with the items had to be rated on a five-point scale.

The items were originally formulated in English and checked by both US and UK natives. They were subsequently translated into Danish and French. Translation into French was done

by two native Frenchmen; translation into Danish was done by one of the authors. Items were arranged by the five constructs in the questionnaire; the sequence in which the five constructs appeared was varied at random in the questionnaire.

Data collection

Data were collected in Denmark, England, and France. Given the nature of this study, sampling was done not with respect to representativeness, but with respect to obtaining three samples which would be as homogeneous as possible. In each country, the target population was defined as married women with children at school age living in metropolitan areas. In each country, one metropolitan area was selected, viz. Copenhagen, London, and Paris. In each of these areas schools were selected (2 in Copenhagen, 4 in London, 3 in Paris), with the aim of soliciting the co-operation of teachers in asking school children to take a questionnaire home to their mothers. In each country, 300 questionnaires were distributed in this way. Questionnaires were distributed on Monday and had to be returned on Wednesday/Thursday. The response rates were 78% in Denmark, 47% in England, and 32% in France, resulting in sample sizes of 233, 139, and 94.

Exploratory factor analysis and construction of scales

For each sample and for the five groups of items, separate exploratory factor analyses (principal component analysis, varimax rotation) were carried out. The aim of this procedure was to check whether items would tend to group together in similar factors across the three samples. Factor congruence across cultures is a major indicator of a cross-culturally similar interpretation of the items (S.C. Grunert, K.G. Grunert & Kristensen, 1992). 21 factors were identified which seem to appear across the three samples. They were:

- shopping scripts: importance of product information, attitude towards advertising, joy of shopping, speciality shops, price criterion, shopping list
- higher-order product attributes: health, price-quality-relation, novelty, organic products
- meal preparation scripts: involvement with cooking, looking after new ways, convenience, whole family, spontaneity, women's task
- usage situations: snacks versus meals, social event
- desired consequences: self-fulfilment in food, security, social relationships.

Items with high loadings on these factors in at least two of the three samples were combined into scales. Scale reliability (Cronbach's alpha) was computed, and where scales contained more than three items the items, which gave the highest reliability for the pooled data, were retained. Subsequently, the reliabilities were checked also for the three samples separately.

The results from these analyses are shown in tables 1 and 2. For each factor table 1 shows the items retained and how they loaded on the respective factor in each of the three samples. Table 2 shows the scale reliabilities, both for the pooled data and for the three samples separately.

Not all the resulting scales are satisfactory. In a number of cases, only two suitable items were found for a scale. The most difficult case was the higher-order product attribute *organic products*. The two items expressly addressing this - '*I always buy organically grown food products if I have the opportunity*' and '*I do not believe in organically grown vegetables*' had no clear patterns of loadings in any of the three samples. An attempt to combine these two items in a scale failed as well, since their intercorrelation is low. The item retained now serves mainly as a reminder that this scale needs further attention. The problem is not completely unexpected, given that purchase of organically grown food products is an area where the relationship between general attitudes, product-specific attitudes and behaviour is especially intricate (Bech-Larsen, 1993; S.C. Grunert & Kristensen, 1992).

Table 1. Exploratory factor analysis

Shopping scripts

Factor name	Item	factor loadings		
		Copen- hagen	London	Paris
Importance of product information	To me product information is of high importance. I need to know what the product contains.	.68	.67	.76
	I compare labels to select the most nutritious food.	.75	.74	.57
	I compare product information labels to decide which brand to buy.	.72	.73	.64
Attitude towards advertising	I have more confidence in food products that I have seen advertised than in unadvertised products.	.56	.55	.55
	I am influenced by what people say about a food product.	.60	.59	.69
	Information from advertising helps me to make better buying decisions.	.69	.56	.59
Joy of shopping	Shopping for food bores me.	-.78	-.79	-.75
	I just love shopping for food.	.82	.71	.82
	Shopping for food is like a game to me.	.60	.60	.81
Speciality shops	I do not see any reason to shop in speciality food stores.	.68	.53	.64
	I like buying food products in speciality stores where I can get expert advice.	-.76	-.62	-.71
	I like to know what I am buying, so I often ask questions in stores where I shop for food.	-.49	-.53	-.50
Price criterion	I always check prices, even on small items.	.69	.72	.58
	I notice when products I buy regularly change in price.	.64	.67	.51
	I watch for ads in the newspaper for store specials and plan to take advantage of them when I go shopping.	.74	.43	.55
Shopping list	Before I do a large food shopping, I make a list of everything I need.	.76	.78	.46
		.77	.73	.48

Table 1 continued

Higher order product attributes

Factor name	Item	factor loadings		
		Copen- hagen	London	Paris
Health	I try to plan the amounts and types of food that the family consumes.	.76	.45	.72
	To me the naturalness of the food that I buy is an important quality.	.50	.60	.58
	I try to avoid food products with additives.	.57	.66	.72
Price-quality-relation	I always try to get the best quality for the best price.	.77	*	.74
	I compare prices between product variants in order to get the best value food.	.83	.58	.81
Novelty	I love trying cooking recipes from foreign countries.	.68	.59	.51
	I like to try new foods that I have never tasted before.	.63	.63	.71
Organic products	I always buy organically grown food products if I have the opportunity.	.75	.75	.56

* item did not load on same factor in London

Table 1 continued

Meal preparation scripts

Factor name	Item	factor loadings		
		Copen- hagen	London	Paris
Involvement with cooking	I deliberately avoid complicated recipes.	.62	.59	.68
	At home we usually eat quickly prepared meals rather than more carefully prepared dishes.	.69	.51	.45
	I have better ways to spend my time than doing grocery shopping and cooking.	.66	*	.69
Looking after new ways	I like to try out new recipes.	.75	*	.71
	I look for ways to prepare unusual meals.	.70	.61	.69
	Recipes and articles on food from other culinary traditions make me experiment in the kitchen.	.65	.46	.51
Convenience	I use frozen foods for at least one meal a day.	.49	.40	.75
	To me, the microwave oven is essential for my cooking.	.54	.68	.65
	I use a lot of mixes, for instance baking mixes and powder soups.	.48	.73	.70
Whole family	The kids always help in the kitchen; for example they peel the potatoes and cut the vegetables.	.70	.58	.54
	My family helps with other mealtime chores, such as dishes and setting the table.	.69	.67	**
	When I do not really feel like cooking, I can get one of the kids or my husband to do it.	.61	.68	.77
Spontaneity	What we are going to have for supper is very often a spontaneous decision.	.64	.67	.65
	Cooking needs to be planned in advance.	-.66	-.68	-.69
Women's task	I consider the kitchen to be a woman's domain.	.55	.59	.55
	It is the woman's responsibility to keep her family healthy by serving a nutritious diet.	.75	.75	.76

* item did not load on same factor in London

** item did not load on same factor in Paris

Table 1 continued

Usage situations

Factor name	Item	factor loadings		
		Copen- hagen	London	Paris
Snacks versus meals	I eat before I get hungry, which means that I am never hungry at meal times.	.56	.41	.62
	I eat whenever I feel the slightest bit hungry.	.48	.57	.50
	In our house, nibbling has taken over and replaced set eating times.	.57	.50	.70
Social event	Going out for dinner is a regular part of our eating habits.	.75	.46	.52
	We often get together with friends to enjoy an easy-to-cook, casual dinner.	.46	.52	.83
	I do not consider it a luxury to go out with my family having dinner in a restaurant.	.67	.44	*

Desired consequences

Factor name	Item	factor loadings		
		Copen- hagen	London	Paris
Self-fulfilment in food	Being praised for my cooking adds a lot to my self-esteem.	.48	.66	*
	Eating is to me a matter of touching, smelling, tasting and seeing, all the senses are involved. It is a very exciting sensation.	.57	.53	*
	I am an excellent cook.	.60	.66	.60
Security	I dislike anything that might change my eating habits.	.73	.53	.62
	I only buy and eat foods which are familiar to me.	.53	.60	.65
Social relationships	I find that dining with friends is an important part of my social life.	.60	.46	.46
	When I serve a dinner to friends, the most important thing is that we are together.	.58	.46	.64

*item did not load on same factor in Paris

Table 2. Scale reliability

Factor	# of items	Cronbach's alpha			
		pooled	Copen- hagen	London	Paris
Shopping scripts					
Importance of product information	3	.76	.77	.80	.71
Attitude towards advertising	3	.67	.67	.70	.61
Joy of shopping	3	.79	.78	.76	.84
Speciality shops	3	.69	.71	.57	.71
Price criterion	3	.65	.73	.63	.51
Shopping list	2	.87	.84	.90	.82
Higher-order product attributes					
Health	3	.59	.57	.56	.66
Price-quality relation	2	.71	.75	.64	.74
Novelty	2	.61	.69	.56	.45
Organic products	1	-	-	-	
Meal preparation scripts					
Involvement with cooking	3	.61	.71	.50	.56
Looking after new ways	3	.66	.71	.57	.61
Convenience	3	.48	.29	.58	.67
Whole family	3	.61	.64	.63	.53
Spontaneity	2	.58	.62	.55	.51
Women's task	2	.50	.51	.39	.40
Usage situations					
Snacks versus meals	3	.57	.45	.63	.62
Social event	3	.47	.54	.40	.45
Desired consequences					
Self-fulfilment in food	3	.43	.46	.55	.44
Security	2	.41	.46	.33	.46
Social relationships	2	.33	.31	.30	.35

Social relationships as a consequence of food and eating is another problem scale. The alphas are rather low, especially in Paris. Some scales do not perform well enough in one of the three countries; this goes for *convenience* in Copenhagen, *women's task* in London, and *social event* in London.

The analyses reported in the following section will shed more light on these difficulties, since the confirmatory factor analyses allow to detect which items in which sample deviate most from the pre-specified structure.

Confirmatory factor analysis

Confirmatory factor analysis can be used to find out whether a set of data is compatible with a pre-specified factor structure. It can also be applied to multiple samples, and can then be used to check whether the data are compatible with the assumption that the factor structure in the samples is the same.

Factor invariance has often been suggested as a validation instrument in cross-cultural research. S.C. Grunert, K.G. Grunert and Kristensen (1992) have recently suggested that several levels of factor congruence may be distinguished, and have related these levels to different degrees of cultural compatibility based on a cognitive view of cultural differences. The basic argument is as follows: If we have a vector of measures which, like in the present study, are taken as indicators of a smaller set of underlying latent variables, then we have, in LISREL notation,

$$X = \Lambda \xi + \delta \quad \text{and}$$

$$\Sigma = \Lambda \Phi \Lambda' + \Theta_{\delta}$$

with X a vector of measured values, Λ a matrix of factor loadings, ξ a vector of factor scores, δ a vector of error terms, Σ the covariance matrix of the measured values, Φ the covariance matrix of the factor scores, and Θ_{δ} the covariance matrix of the error terms.

When talking about factor congruence, the common interpretation is that the matrix of loadings in two samples has the same pattern, i.e., the same non-zero elements. However, this is obviously only the weakest form of comparability between two sets of data. A stronger form of comparability would exist when the matrix of loadings were in fact identical, since this seems to indicate that the way in which the measurement items relate to underlying constructs was in fact the same across samples. This would still allow, however, differences in how the factors are correlated in the two samples, and differences in error, i.e., in the reliability of the individual items. Identical correlations between the factors would strengthen our confidence in that the factors do in fact tap the same sets of meanings in different cultures, whereas identical item reliability would strengthen our belief in that the individual items in fact were perceived (cognitively processed) in the same way. In cross-cultural research, which usually involves translation and therefore mapping questionnaire items from one set of cognitive categories into another, we would not usually expect item reliability to be the same.

Thus, four levels of cross-cultural comparability can be distinguished (S.C. Grunert, K.G. Grunert & Kristensen, 1992):

- Λ_i and Λ_j have the same pattern: *minimal cultural comparability*
- $\Lambda_i = \Lambda_j$: *weak cultural comparability*
- $\Lambda_i = \Lambda_j$, and $\Phi_i = \Phi_j$: *strong cultural comparability*
- $\Lambda_i = \Lambda_j$, $\Phi_i = \Phi_j$, and $\Theta_{\delta_i} = \Theta_{\delta_j}$: *weak cultural identity*

The strongest condition is called weak cultural identity, because the only way in which the samples can differ is in the level of endorsement of the various items, while everything else - their complete meaning structure, including item reliability - is the same. When also the levels of endorsement are the same, one would talk *about strong cultural identity*.

For each of the five areas of food-related life style, the items retained according to tables 1 and 2 were entered into confirmatory factor analyses corresponding to the four levels of cultural comparability described above. The results can be seen in table 3. Several measures of fit are given: for each sample, the goodness of fit index GFI and the root mean square residuals RMR, and for the set of three samples the χ^2 value and the degrees of freedom. Since the χ^2 value is vulnerable to sample size, a rule of thumb is to divide χ^2 by the degrees of freedom. If the resulting value is lower than 10, the model can be assumed to fit the data as long as the GFI is about .90 and the RMR below .10 (cf. Hildebrandt, 1983). The results from the analysis can also be used to detect weak items. This can be done by inspecting the estimated loadings, the item reliability, and the modifications indices for loadings forced to be zero.

Table 3. Confirmatory factor analysis

FRL area	Copenhagen		London		Paris		χ^2/df
	GFI	RMR	GFI	RMR	GFI	RMR	
Shopping scripts							
minimum cultural comparability	.907	.093	.850	.154	.898	.102	1.683
weak cultural comparability	.901	.096	.832	.144	.887	.107	1.711
strong cultural comparability	.894	.110	.822	.176	.869	.135	1.657
weak cultural identity	.877	.118	.799	.178	.854	.134	1.724
Higher-order product attributes							
minimum cultural comparability	.969	.046	.978	.049	.954	.067	1.467
weak cultural comparability	.967	.049	.976	.056	.951	.083	1.324
strong cultural comparability	.959	.071	.958	.087	.924	.119	1.418
weak cultural identity	.945	.082	.944	.093	.905	.144	1.530
Meal preparation scripts							
minimum cultural comparability	.945	.071	.888	.130	.864	.111	1.451
weak cultural comparability	.941	.077	.874	.137	.861	.119	1.430
strong cultural comparability	.926	.103	.859	.163	.814	.165	1.558
weak cultural identity	.898	.122	.828	.185	.792	.178	1.813
Usage situations							
minimum cultural comparability	.964	.082	.984	.061	.982	.051	1.584
weak cultural comparability	.961	.086	.981	.069	.977	.066	1.345
strong cultural comparability	.955	.101	.972	.101	.978	.067	1.551
weak cultural identity	.952	.097	.956	.124	.951	.104	1.354
Desired consequences							
minimum cultural comparability	.976	.067	.972	.079	.975	.056	1.337
weak cultural comparability	.972	.070	.972	.076	.964	.073	1.229
strong cultural comparability	.970	.075	.959	.113	.945	.104	1.109
weak cultural identity	.954	.101	.943	.145	.933	.118	1.210

Shopping scripts. The tests yield results which indicate that the criteria of minimum and weak cultural comparability can be accepted at least for the Copenhagen and Paris samples. The values for the London sample are clearly worse. The problematic items are mainly *I like to know what I am buying, so I often ask questions in stores where I shop for food*, and *I am influenced by what people say about a food product*. Both items have low reliability in all three samples. The modification indices show that *I like to know what I am buying, so I often ask questions in stores where I shop for food* would rather load on the factors *Importance of product information* and *price criterion* in Denmark. The item *I am influenced by what people say about a food product* has no clear attachment to another factor. In the London sample, the most problematic items were *I do not see any reason to show in speciality shops, I always check prices, even on small items* and *I watch for ads in the newspaper for store specials and plan to take advantage of them when I go shopping*, all of which have low reliability. The latter item would, in the London sample, rather load on the *attitude towards advertising* factor than on the *price criterion* factor.

Higher-order product attributes. All four tests show a reasonably good fit, but weak cultural comparability seems again to be the best description across the three samples, considering especially the behaviour of the RMR in the Paris sample. The most problematic items were *I compare prices between product variants in order to get the best value food*, which had only moderate loadings on the *price-quality relation* factor, and which also had low reliability, and the item *I always buy organically grown food products if I have the opportunity*, which had low reliability. As mentioned above, this item stands alone for the factor *organic products*, because no scale could be constructed.

Meal preparation scripts. The fit is not as good as for the other aspects of FRL, and the fit for the Danish sample is notably better than for the other two. A main problem seems to reside in the *convenience* scale. All three items had low reliability in Denmark; differences in item reliability between the three samples were especially pronounced with regard to the item *I use a lot of mixes, for instance baking mixes and powder soups*. Baking mixes are very rarely used in Denmark, leading to a very skewed distribution, but are popular in England, and seem to be a good indicator of convenience in France, even though they are not widely used. The item *To me, the microwave oven is essential for my cooking* had very low reliability both in Denmark and France, where very few respondents endorsed that statement. The most stable item in this scale was *I use frozen foods for at least one meal a day*, and that may not even be a convenience item, since the use of frozen foods - and not just frozen ready meals - may express a storage policy more than a tendency towards convenience. There were also problems with the *women's task* scale, where the item *It is the woman's responsibility to keep her family healthy by serving a nutritious diet* had low loadings and reliability in both Denmark and England - a possible interpretation may be that this item may have been perceived more than a health item than as a sex role item in these samples.

Usage situations. The data have generally a high degree of comparability. All datasets fulfil the conditions of weak cultural comparability, and even for the two more stringent criteria the fit indices are still rather acceptable. The *social event* scale was, however, not without problems. Two out of the three items had low reliability in all three samples. The high

reliability item *Going out for dinner is a regular part of our eating habits* may actually just be a going-out item, whereas *We often get together with friends to enjoy an easy-to-cook, casual dinner* may tap other dimensions like convenience, and the item *I do not consider it a luxury to go out with my family having dinner in a restaurant* may trigger price/economy associations as well.

Desired consequences. As for *usage situations*, the data have generally a high degree of comparability. All datasets fulfil the conditions of weak cultural comparability, and even for the two more stringent criteria the fit indices are still rather acceptable. The internal consistency of the scales *security* and *social relationships* could generally be improved, however, and the item *I am an excellent cook* has low reliability.

In general, the results of the confirmatory factor analysis show that the scales developed are a promising starting point for the development of a cross-culturally valid instrument to measure food-related life styles. For all five elements of food-related life style, at least the level of weak cultural comparability was obtained. However, the analysis also pointed at certain scale items which could be improved in future studies.

Intercorrelation between the scales

We expect the 21 scales to be intercorrelated, especially also across the five elements of food-related life style. Looking at the pooled data, actually 76 out of the 210 possible correlations were statistically significant at the .01 level. Attempts to visualise the correlation structure in a MDS diagram with two or three dimensions failed - this was, of course, expected, since one of our basic premises was that life style constructs can *not* be usually reduced to two or three dimensions. We therefore choose a network model to show the major relationships between the FRL dimensions: starting with the highest significant correlation, correlated scales are subsequently entered as linked nodes. Direct links between scales which are already linked indirectly are not added (non-redundant network). The result can be seen in figure 4.

The grouping of the scales in the network is intuitively plausible. The social aspect of meal preparation *whole family*, the usage situation *social event* and the desired consequence *social relationships* are correlated. The desired consequence *self-fulfilment in food* is related to *novelty* as a higher-order product attribute and to *looking after new ways in meal preparation*. *Security* as a desired consequence is correlated with *women's task*. *Involvement with cooking* is linked to *joy of shopping* and *speciality shops*, and is negatively associated with *spontaneity* and *convenience*. *Convenience*, on the other hand, is related to *snacks versus meals* and *attitude towards advertising*. *Importance of product information* is related to the shopping scripts *price criterion* and *shopping list*, and to the higher-order product attributes *health* and *organic products*.

*Table 4. Differences in scale means between samples (all scales standardised to a range 1-5, standard deviations in parentheses, * indicates that analysis of variance is significant at .05 level)*

Scale	Copenhagen	London	Paris
Shopping scripts			
Importance of product information*	3.44 (.96)	3.21 (1.02)	3.05 (.80)
Attitude towards advertising*	2.38 (.81)	2.65 (.87)	2.35 (.77)
Joy of shopping*	2.76 (.92)	2.49 (1.03)	2.91 (.99)
Speciality shops*	3.17 (.94)	2.61 (.88)	2.79 (.99)
Price criterion*	3.69 (.96)	3.21 (.96)	3.35 (.78)
Shopping list*	4.32 (.93)	3.52 (1.34)	3.82 (1.04)
Higher-order product attributes			
Health	3.74 (.75)	3.70 (.74)	3.61 (.87)
Price-quality relation	4.08 (.84)	3.92 (.90)	4.02 (.88)
Novelty	3.72 (.97)	3.69 (.90)	3.61 (.78)
Organic products*	2.19 (1.17)	2.28 (1.16)	2.60 (1.23)
Meal preparation scripts			
Involvement with cooking	3.00 (.99)	3.18 (.89)	3.10 (.85)
Looking after new ways	3.52 (.89)	3.36 (.83)	3.57 (.75)
Convenience*	1.94 (.65)	2.38 (.97)	2.30 (.92)
Whole family	3.28 (.99)	3.35 (1.05)	3.37 (.86)
Spontaneity	3.29 (1.03)	3.15 (.98)	3.22 (.98)
Women's task*	1.91 (.89)	2.67 (1.06)	2.52 (.92)
Usage situations			
Snacks versus meals*	1.75 (.68)	1.99 (.72)	2.17 (.88)
Social event	2.38 (.90)	2.41 (.81)	2.53 (.92)
Desired consequences			
Self-fulfilment in food	3.27 (.76)	3.35 (.77)	3.32 (.93)
Security*	2.03 (.84)	2.31 (.78)	2.32 (.84)
Social relationships*	4.02 (.79)	3.68 (.89)	3.63 (.88)

Differences between samples

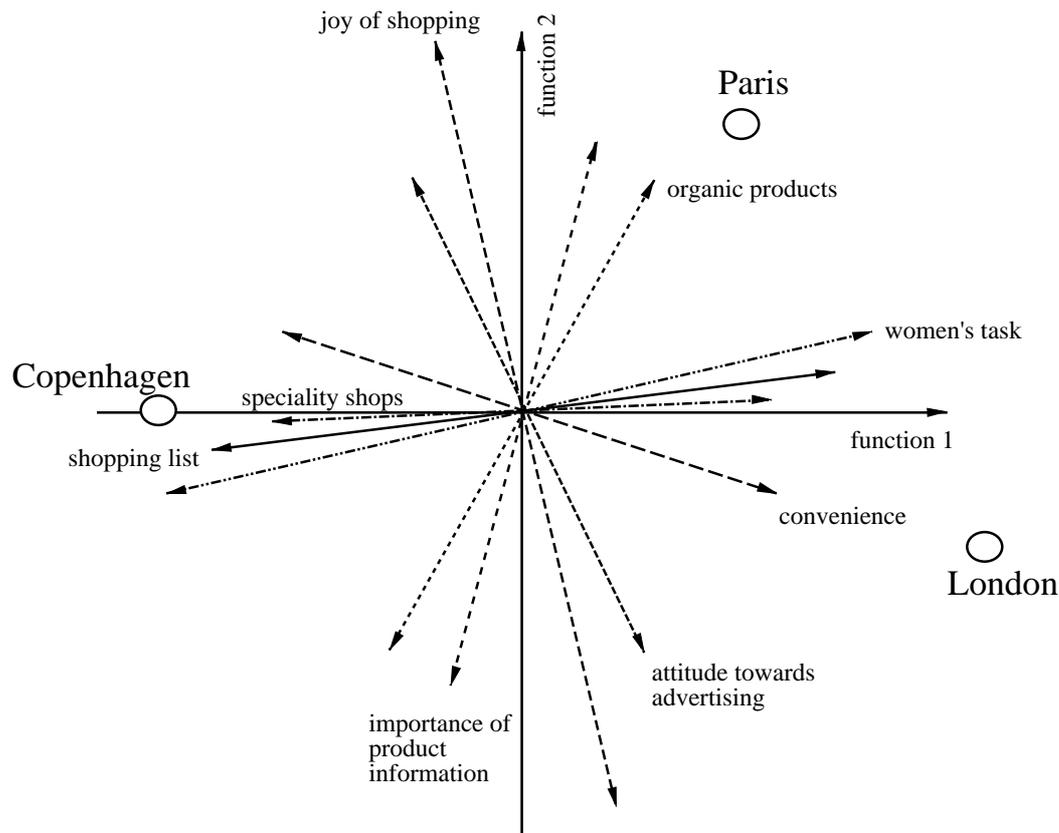
Since the samples are non-representative and the aim of the present study is to investigate scale properties, the data are not suitable to draw any substantial inferences on cross-cultural differences in food-related life style. Nevertheless, we would expect some substantial differences between the three samples, give the different cultural contexts from which they were drawn. Put the other way, not finding such differences would raise doubt concerning the ability of the instrument to detect cross-cultural differences. For this reason, we have looked at differences between the three samples also from a substantial perspective.

Table 4 shows the means and standard deviations for the 21 scales in the three samples. Significant differences show up especially with regard to shopping scripts, but also within the other elements of FRL. For further illustration, a discriminant analysis was conducted with the three samples as the grouping variable and the 21 scales as discriminators. The positioning of the three samples in discriminant space is calculated and shown in figure 5 together with vectors symbolising the scales. The direction and length of these vectors are determined by the correlation between the scales and the discriminating axes. Both discriminant axes are significant. Only scales which correlate at least .30 with one of the discriminating functions are shown.

Interestingly, all but one of the scales thus remaining, i.e., all but one of the scales having the highest discriminatory power between the three samples, are scales referring to procedural knowledge - either shopping scripts or meal preparation scripts. This underlines our argument that procedural knowledge is an important aspect of food-related life style, especially when conducting cross-cultural analyses.

The scales clearly allow discrimination between the three samples, so that this test of construct validity can be held to be passed.

Figure 5. Discriminant analysis



Conclusions

Starting from the need to develop an efficient instrument for the surveillance of consumers on export markets, we have attempted to present a new view of life style, based on a cognitive perspective, which makes life style specific to certain areas of consumption. The specific area of consumption studied here is food, resulting in a concept of food-related life style. We have tried to develop an instrument that can measure food-related life style in a cross-culturally valid way. To this end, we have collected a pool of 202 items, collected data in three countries, and have constructed scales based on cross-culturally stable factor patterns. These scales have then been subjected to a number of tests of reliability and validity. Even though some items and scales did show problems, the overall results are very promising: It seems we have tapped a set of relevant aspects of food-related life style which can be used in cross-cultural studies aimed at market surveillance.

Three types of tasks are required for future research. Firstly, it would be desirable to replicate the present study, either with the same or an improved set of items, with more samples from more cultures. Secondly, it is important to supplement the FRL items with items on product-specific action tendencies and with measurements of purchase behaviour, in order to investigate the predictive ability of the instrument for purchase behaviour. Thirdly, a revised version of the instrument should be applied to larger, representative samples in some countries in order to study its properties for clustering and segmentation.

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- No. 1: Grunert, K. G. & Baadsgaard, A. *Market-based Process and Product Innovation in the Food sector: A Danish Research Programme*, January 1992.
- No. 2: Thøgersen, J. *Fødevarerinnovation og Emballage - Miljøkonsekvenser og Forbrugerreaktioner*, Marts 1992.
- No. 3: Bonke, J. *Choice of Foods - allocation of time and money, household production and market services*, September 1992.
- No. 4: Grunert, K. G. & Ellegaard, C. *The Concept of Key Success Factors: Theory and Method*, October 1992.
- No. 5: Harmsen, H. *Determinanter for Produktinnovationssucces*, November 1992.
- No. 6: Grunert, K. G., Nissen, L. & Wildenhoff, L. *Do Danish Food Companies Analyse their Competitors*, February 1993.
- No. 7: Bech-Larsen, T.: *Overvejer forbrugerne emballagens funktions- og miljøegenskaber, når de køber fødevarer?* Februar 1993.
- No. 8: Lassen, J. *Food Quality and the Consumer*, March 1993.
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The Mapp programme consists of the following 15 projects

1. Strategic Planning and Innovation Capability in the Danish Food Sector
Morten Kvistgaard & Kirsten Plichta, Copenhagen Business School; Lone Rossen, Biotechnological Institute
2. Innovation Capability as a Key Success Factor
Klaus G. Grunert & Hanne Harmsen, The Aarhus School of Business
4. Definition of the Sales Potential for a New Food Product to be Launched on Home or Foreign Markets
Anne Martensen & Kenneth Kæregaard, Copenhagen Business School
5. Primary Producers and Product Innovation in the Food Industry
Villy Sjøgaard, University Centre of South Jutland
6. Controlling Processes of Production to Guarantee Process Characteristics Demanded by Consumers of Food Products: Paradigms and Danish Experiences
Esben Sloth-Andersen, Aalborg University Centre
7. The Role of the Distribution System in Product Innovation
Hanne Hartvig Larsen & Nick Norman Jensen, Copenhagen Business School
8. Prototyping in the Danish Food Industry
Preben Sander Kristensen, Aalborg University Centre
9. Product Quality and Consumer Preferences: Assessing the Optimum Design of Food Products
Kai Kristensen, Hans Jørn Juhl, Anne Bech & Erling Engelund, The Aarhus School of Business; Carsten Stig Poulsen, Aalborg University Centre
10. Product Innovation and Packaging in the Food Industry - Environmental Consequences and Consumer Reactions
John Thøgersen & Tino Bech-Larsen, The Aarhus School of Business
11. The Consumer as Agent in Relation to Research and Development in Food Technology
Erling Jelsøe, Birgit Land & Jesper Lassen, Roskilde University Centre
12. Households' Choice of Foodstuffs with Different Kinds of Preparation
Jens Bonke, University of Copenhagen
13. The Cultural Dimensions of Food Consumption and the Implications for Strategy Formation and Implementation in Small and Medium-sized Danish Companies
Dominique Bouchet, Josette Andersen, Søren Askegaard, Tage Koed Madsen & Per Østergaard, Odense University
14. Market Surveillance Systems for the Food Sector
Klaus G. Grunert & Karen Brunsø, The Aarhus School of Business
15. Identification of Key Success Factors
Klaus G. Grunert & Elin Sørensen, The Aarhus School of Business