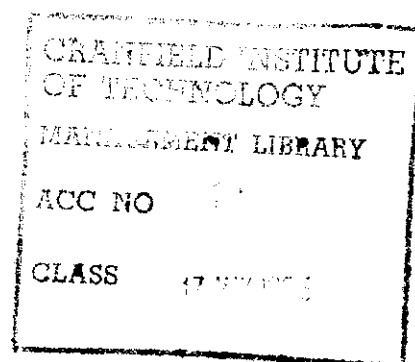


COGNITIVE STYLE AND CONSUMER INNOVATIVENESS

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ABSTRACT

The identification of consumer innovators offers marketing managers the opportunity to tailor new products to the buyers who initiate the diffusion of innovations. Progress has been made in identifying such consumers in economic and social terms, but there are advantages of cost and convenience in isolating the personality profiles of innovators, especially during prelaunch product testing. But innovative consumers' distinctive personality traits have proved elusive. This paper reports an investigation of innovative brand choice in the context of new food product purchasing which employed the Adaption-Innovation Inventory (KAI). This highly reliable test of cognitive style correlates with several personality traits known to be associated with innovativeness; it also has high validity in the prediction of behaviour over a wide range of contexts. The research reported went beyond the common expectation of a simple, direct relationship between personality and brand choice to investigate the predictive validity of the KAI over a range of product continuity/discontinuity. The results are considerably more encouraging than those of earlier research for the identification of personality/consumer choice links. They suggest an operational measure of product continuity/discontinuity and support the use of the KAI as a viable marketing tool.

INTRODUCTION

That the earliest adopters of new products differ socially, economically or psychologically from the less innovative consumers who make up the bulk of the market is a proposition widely accepted in marketing circles. It is also generally believed that these differences can be of practical importance in new product development and marketing. Thus, the accurate identification of prospective consumer innovators has often been suggested as a necessary prerequisite of the sound prelaunch testing and development of new consumer goods. Midgley (1977) argues that concept and product tests should involve disproportionate numbers of innovators so that the reactions of those who initiate the diffusion process can be fully assessed. Other authors (e.g. Baker 1983) advocate the design of marketing programmes which appeal specifically to innovators so that the elapsed time between the launch of new product and its first adoption may be minimised and the process of diffusion accelerated. These and other applications of diffusion theory in marketing rest, however, upon the assumption that the factors which separate innovators from later adopters can be recognised and measured.

Some progress has been made in identifying the social, economic and behavioural factors which distinguish final consumer innovators (Foxall 1984a). But the attempt to isolate consumer innovators on the basis of any particular personality characteristics they might possess has proved largely unsuccessful despite the central position personality has occupied within diffusion theory and the limited but favourable evidence linking facets of personality with innovative behaviour in spheres beyond marketing (Rogers 1983, pp. 357-358). This lack of success reflects the results of using personality tests in consumer research generally. Dozens, perhaps hundreds, of researchers have sought to measure the association of personality with product and brand choice but the vast majority of

investigations indicate that 'if correlations do exist they are so weak as to be questionable or perhaps meaningless' (Kassarjian and Sheffet 1982, p.168; see also Kassarjian 1971; Pizzam 1972).

Further research is to be encouraged for several reasons. First, there is the impetus from marketing management, the potential advantages to be gained from an operational measure of innovativeness based upon an easily-administered personality inventory. Compared with existing social, economic and behavioural measures of innovative adoption, which are often applicable only *ex post*, cumbersome, and costly to devise and administer, such a test promises to be implementable in the prelaunch stage of product development and relatively inexpensive. Secondly, the explanation of innovative behaviour (from both practical and purely academic standpoints) requires operational definitions of innovativeness which link abstract constructs with measureable verbal and overt behaviours. Several approaches to such explanation incorporate high-level constructs of innovativeness as hypothetical explanatory variables but do not present the means to make their abstractions operational and testable. Midgely and Dowling (1978), for instance, in one of the more sophisticated attempts to understand innovation, propose that observed innovative behaviour is explicable in terms of 'innate innovativeness', the hypothetical capacity of consumers to make independent innovative decisions, and the situational factors which facilitate or impede the expression of this capacity. 'Innate innovativeness' is described somewhat vaguely, however, as 'a function of (yet to be specified) dimensions of the human personality' (Midgley and Dowling 1978, p.235). There remains, therefore, the scientific need to confirm or disconfirm such theories by means of an operational measure of personality-based innovativeness.

A third consideration which provides stimulation for further research is the possibility of assessing in the context of consumer behaviour a personality test which has

been previously validated in the prediction of economic behaviours. Consumer researchers interested in innovativeness and personality have, on the whole, appropriated tests from other areas of research and practice (notably tests devised in clinical settings); such tests are often valid and reliable only within the domains in which they originated. Ignoring the theory-ladenness of the test instruments so appropriated, many researchers have arbitrarily amended inventories and assumed that their sensitivity, established in one realm of investigation, will transfer automatically to another (see Kassarjian and Sheffet 1982, pp.168-176).

With these considerations in mind, we report in this article a study of consumers' purchases of new food items which employed the Kirton Adaption-Innovation Inventory, a theoretically-based measure of cognitive style which has achieved considerable success in the prediction of behaviour in situations calling for problem-solving and decision-making (Kirton 1986a, b).

ADAPTION-INNOVATION THEORY

The adaption-innovation theory advanced by Kirton (1976) in the context of organisational behaviour proposes that individuals characteristically exhibit one of two distinct styles of problem-solving and decision-making. Extreme 'adaptors' confine their problem-solving endeavours to the frame of reference in which they perceive the problem to have arisen. They tend to produce better ways of accomplishing familiar tasks and their solutions can be unobtrusively implemented within established organisational structures and working practices. Extreme 'innovators', by contrast, are less likely to seek solutions that can be readily accommodated within the context within which the problem is given. They tend, as a fundamental expression of their problem-solving style, to evaluate the frame of reference within which the problem is presented and, as they seek solutions, they redefine and reconstitute both the problem and the

context of its origin. Thus they tend to produce different ways of organising, deciding and behaving which entail radical change, the ramifications of which extend well beyond the initial problem. The theory assumes that everyone can be placed upon a continuum the polar extremes of which are these extremely adaptive and extremely innovative styles of problem-solving. It predicts that adaptors will adopt solutions which improve technical efficiency but involve practices and objects which are similar to those previously employed for the same purpose; solutions by innovators, however, are likely to require some realignment of objectives and plans, and the incorporation of novel activities, techniques and objects (Foxall 1986a).

Table I summarises the characteristics of adaptors and innovators and their mutual perceptions.

The Measurement of Cognitive Style

Kirton's theory describes the cognitive styles of adaptors and innovators. An individual's style refers to his or her characteristic manner of behaving over situations and time. Cognitive style refers to the person's consistent patterns of processing information and organising it into a system of thought which influences behaviour. It is a measurable intervening variable which mediates stimulus and response, accounting in part for their consistency and it is closely related to personality, whether this is conceptualised principally in terms of an underlying intrapersonal determinant of behaviour or in terms the regularity and consistency of behaviour itself. Cognitive style is independent of cognitive complexity or ability, a description of the how of performance rather than its level. It is value-neutral in the sense that alternative styles are regarded equally well, none being intrinsically better or worse than another. So adaptors and innovators are neither superior nor inferior to one another, though each has

TABLE 1

Behaviour descriptions of adaptors and innovators

Adaptor	Innovator
Characterised by precision, reliability, efficiency, methodicalness, prudence, discipline, conformity.	Seen as undisciplined, thinking tangentially approaching tasks from unsuspected angles.
Concerned with resolving problems rather than finding them.	Could be said to discover problems and discover avenues of solution.
Seeks solutions to problems in tried and understood ways.	Queries problems' concomitant assumptions; manipulates problems.
Reduces problems by improvement and greater efficiency, with maximum of continuity and stability	Is catalyst to settled groups, irreverent of their consensual views; seen as abrasive, creating dissonance.
Seen as sound, conforming, safe, dependable.	Seen as unsound, impractical; often shocks his opposite.
Liable to make goals of means.	In pursuit of goals treats accepted means with little regard.
Seems impervious to boredom, seems able to maintain high accuracy in long spells of detailed work.	Capable of detailed routine (systems maintenance) for only short bursts. Quick to delegate routine tasks.
Is an authority within given structures.	Tends to take control in unstructured situations.
Challenges rules rarely, cautiously, when assured of strong support.	Often challenges rules, little respect for past custom.
Tends to high self-doubt. Reacts to criticism by closer outward conformity. Vulnerable to social pressure and authority; compliant.	Appears to have low self-doubt when generating ideas, not needing consensus to maintain certitude in face of opposition.
Is essential to the functioning of institution all the time, but occasionally needs to be "dug out" of his systems	In the institution is ideal in unscheduled crises or better still to help avoid them, if he can be controlled.
When collaborating with innovators: supplies stability, order, and continuity to the partnership	When collaborating with adaptors: supplies the task orientations, the break with the past and accepted theory.
Sensitive to people, maintains group cohesion and co-operation	Insensitive to people, often threatens group cohesion and co-operation
Provides a safe base for the innovator's riskier operations	Provides the dynamics to bring about periodic radical change, without which institutions tend to ossify.

Source: First published in Kirton M.J. (1976) "Adaptors and Innovators: A Description and Measure", *Journal of Applied Psychology*, Vol.61, No.5, p.623. Copyright 1976 by the American Psychological Association. Reproduced by permission of M.J. Kirton and the American Psychological Association.

certain skills which make it easier or harder to accommodate to specific situations (Goldstein and Blackman 1978, 1981; McKenna 1984).

The cognitive styles of adaptors and innovators can be measured by the Kirton Adaption-Innovation Inventory (KAI), 32 five-point scales on which the respondent indicates the degree of ease or difficulty with which he feels he could consistently maintain specified adaptive and innovative behaviours over time (Kirton 1977a). The behaviours which comprise scale items include responding favourably to the stimulation of change and adherence, by preference, to the established rules. Responses are computed into an overall score for each respondent; the theoretical range of such scores is from 32 to 160. Respondents who score below the mid-point (96) are termed 'adaptors'; those who score higher than this, 'innovators'.

An individual's total score is composed of scores on three independent subscales which measure Originality (the O subscale), Efficiency (E) and Rule-conformity (R). The O score reflects at its lower extreme a preference for the production of fewer (albeit sound and implementable) new ideas within existing norms (adaptive) and, at the other extreme, a preference for the proliferation of ideas, some of which are outlandish (innovative). The E subscale also encompasses a range of behaviours, from the precise, orderly and reliable actions of the adaptor, to the discontinuous, anti-status quo and potentially subversive actions of the innovator. The R scale indicates a range stretching from the methodical, socially-prescribed and conformist behaviour of the adaptor to the more spontaneous and unconstrained actions of the innovator. Like the overall KAI scale, each subscale is scored in such a way that it increases in the direction of innovativeness.

Psychometric Properties of the KAI

KAI scores for a large British general population sample (N=562) are normally distributed over an observed range of 46-146 with a mean of 94.99 (standard deviation, SD, 17.90) which approximates the theoretical mean of 96. (Similar means and distributions have been obtained for large general population samples in the U.S.A. and Italy). KAI scores of females tend to be more adaptive than those of males; in the U.K. general population sample, female respondents' KAI mean 90.84 (SD 17.82) compared with male respondents' mean of 98.12 (SD 16.75). The difference is significant ($p < 0.001$) (Kirton 1977a; see also Foxall 1986a).

The KAI has a high level of internal consistency: test-retest reliability coefficients have been calculated as 0.82 (N=106, intervals from 5-18 months) by Gryskiewicz et al. (1985) [1].

Since cognitive style is conceptualised as a consistent mediator of behaviour, it should correlate well with dimensions of personality which have themselves been shown to be stable. The large amount of research which has now been conducted for the KAI in this regard takes the form of correlations of scores on the KAI and established personality inventories. Such evidence is now available in the form of over sixty correlations, produced by more than twenty independent scholars in some eight countries, involving over twenty different psychological tests (Kirton 1986a). In summary:

'What is emerging ... is a fuller picture of the personality characteristics of the adaptor-innovator styles of cognitive process. The innovator tends to be more extravert, less dogmatic, more tolerant of ambiguity, more radical, more flexible, more creatively motivated, more creatively self-perceptive, more assertive,

expedient, self-assured, undisciplined, independent and sensation-seeking than the adaptor; with more self-esteem, liable to risk-taking, needing (and liking) less structure, and is more spontaneous. The adaptor is more controlled, less stimulating, more steady, reliable, prudent and probably more often seen as right and dependable, better able to fit into teams, get on with authority, be sensitive to policy and mores; be more realistic, efficient and orderly. Neither type (extreme) is likely to be any more or less neurotic, more or less likely to reach high position (except in conditions unfavourable to type), be more or less intelligent, resourceful, original, creative and generally regarded in worldly terms as successful' (Kirton 1986b).

Not only does the KAI possess attractive psychometric properties in general: as noted earlier, it has also been shown to have a high degree of predictive validity in the sphere of economic problem-solving (Kirton 1984, 1986a, 1986b). Moreover, several of the correlates of the KAI listed above are psychological and behavioural factors which have been associated in the diffusion literature with the adoption of new ideas, practices and products. Relative to later adoptors, innovators tend to be less dogmatic, more able to cope with abstractions, ambiguity and uncertainty, less fatalistic (and presumably therefore more likely to be flexible, self-controlled and unsubjected) and higher in achievement motivation and aspiration (Rogers 1983, pp.257-258). Many of the descriptions of innovators in Table I are thus likely to apply accurately to consumer innovators. The research described below investigated the relationship between the concept of cognitive style described by adaption-innovation theory and measured by the KAI and the purchase of food innovations. Its specific objectives were: (i) to assess KAI as a means of identifying potential consumer innovators as an aid to new product development, (ii) to attempt to clarify explanatory issues in consumer innovativeness, and (iii) to make recommendations about future research.

THE RESEARCH

Method

The KAI was administered to a quota sample by social class of 101 female consumers (hereafter the food consumer sample or FCS) recruited by a professional market research firm as they left a supermarket in a medium-sized town in southeast England. Individuals were recruited only if they had purchased at least one of 13 innovative brands identified by that firm as having been recently launched and available in that town for approximately four months. No attempt was made to recruit consumers who had purchased none of the 13 items: such consumers would not have constituted a control group since they might well have been innovators for other new items. In addition to completing the KAI schedule in a nearby hall, respondents indicated their frequency of those of the 13 new brands which they had purchased during the previous four months. They also indicated whether they had purchased a named, established alternative brand or product during the same period.

The product categories employed are shown in Table II. The products were listed randomly in the test by brand name but are shown in the table according to the degree of relative continuity/discontinuity attributed to each new brand (in comparison with its established alternative) by a panel of six female food consumers who had been recruited on an ad hoc basis. Product continuity and discontinuity were carefully defined for this panel after Robertson's (1967) classification:

continuous innovations are those which are least disruptive in their impact on consumption behaviour compared with their current alternatives (e.g. line extensions and alterations to existing products such as fluoride toothpaste);

Table II - Product Categories: Innovative and Established BrandsInnovationEstablished Counterpart

DISCONTINUOUS

A garlic salad dressing
 Instant decaffeinated coffee
 Low calorie, sugar-free snack
 biscuit

Salad Cream (same brand name)
 Instant Coffee (same brand name)
 Traditional snack biscuit

DYNAMICALLY CONTINUOUS

Mixer sherry
 Reduced fat sausages
 Reduced fat cheddar cheese
 Fibre-rich Cereal
 Savoury Wheat Cracker Biscuits

Cream Sherry (same brand name)
 Traditional Pork-sausages
 Traditional Cheddar Cheese
 Corn Flakes (same brand name)
 Cream Cracker Biscuits (same brand name)

CONTINUOUS

Drinking Yoghurt
 Cream and Vegetable Oil Spread
 Cheese Sauce Granules
 Battered Haddock Steaks
 Mixed Fruit Drink

Fruit-flavoured milk drink
 Butter
 Cheese Sauce Packet Mix
 Breaded Fish Fingers
 Established Carbonated drink

dynamically continuous innovations are those which have some disruptive influence on consumption behaviour but which do not change established patterns of behaviour fundamentally (e.g. an electric toothbrush);

discontinuous innovations have considerably disruptive impact on consumption behaviour or are associated with a basic change in lifestyle or consumption habits (e.g. new items which are distinct from existing offerings in terms of taste, function or content such as video recorders or microwave ovens).

None of the examples given to this group during their initial briefing was similar to the product categories employed in the research. Members of the panel were asked to classify each of the 13 innovative brands employed in the research by comparing it carefully with an established alternative within the same product class. As far as possible, the established item was a direct, current substitute for the innovative product; in the case of continuous innovations, the corresponding established brand was drawn from broadly the same product class. After discussion, the panel agreed on the classification shown in Table II.

Derivation of Hypotheses

The investigation reported here differs from most previous research which has attempted to link personality and consumer choice by taking account from the beginning of the many personal and situational factors which impinge upon decision-making in the marketplace to influence brand selection. Factors such as brand availability, social pressures to purchase specific items, the non-product elements of the marketing mix, the adaptive-innovative characteristics of those on whose behalf purchases are made,

previous behaviour and its consequences, and so on are all likely to reduce the impact of personality on the outcome of what is for the most part low involvement decision-making. Given these influences, the measurable impact of personality variables must be small (Kassarjian and Sheffet 1982, p.171).

A more subtle means than those usually employed in personality research was, therefore, required if the links suggested by innovation theory and the demonstrated psychometric sensitivity of the KAI were to be identified. The selection of a sample of consumer innovators naturally increased the likelihood that the respondents would as a whole prove more innovative in terms of the KAI than members of the female general population. But the recruitment criterion employed would almost certainly not be sufficiently subtle to allow differences among members of the FCS to be identified over the entire range of continuous and discontinuous innovations. There is, in fact, empirical evidence, gained in an investigation of the KAI and food purchasing, which shows clearly that there exists no straightforward relationship between cognitive style and the number of innovations purchased (Goldsmith 1983; cf. Mudd and McGrath 1985). However, by employing a second variable likely to be associated with KAI, namely the degree of continuity/discontinuity involved in the innovations, it was expected that some intra-FCS differences would be apparent from the analysis. Specific hypotheses were derived by means of which an inter-sample difference in KAI means was predicted, rather than a strong and direct intra-FCS difference between the means of relatively light and relatively heavy purchasers of innovations. It was expected that any intra-FCS differences among consumers would be related to the degree of continuity/discontinuity of the purchased innovations.

It was hypothesised first that the innovativeness of members of the FCS (understood in terms of adaption-innovation theory) would show up in that sample's

mean KAI score being significantly greater than that of females in the general population (Hypothesis 1).

It was hypothesised further that whilst there were good theoretical reasons to expect a positive relationship between KAI and innovative purchasing, this would be reflected in only a weak correlation between cognitive style and the number of new brands purchased (Hypothesis 2). Nor was it expected that any particular number of new product purchases would act as a cut-off point, separating lower from higher KAI scores according to their having respectively purchased fewer and more new items (Hypothesis 3).

Previous research in this area, whether it has involved the KAI or other personality-related variables, has treated the brands under investigation as homogeneous. The investigation reported here represents, therefore, a major departure in that it attempted to distinguish new brands in terms of their continuity/discontinuity (albeit initially by the somewhat crude method described above, though subsequently by seeking a more sophisticated operational measure of Robertson's qualitatively defined constructs). It was hypothesised that purchase of the discontinuous innovations would be undertaken by consumers who were significantly more innovative (in terms of their overall KAI mean) than (i) members of the female general population, and (ii) purchasers of the established counterparts of the new brands (Hypothesis 4).

In the case of the continuous innovations, however, it was expected that the small differences between new and old brands would appeal particularly to adopters by whom they would be perceived as lying within the existing frame of reference. Innovators would be likely to sweep aside such differences, perceiving them as trivial. It was finally hypothesised, therefore, that purchase of the continuous innovations would

be undertaken by consumers whose KAI means were significantly more adaptive than those of (i) the female general population, and (ii) purchasers of the established counterparts of the new brands (Hypothesis 5)[2].

RESULTS AND DISCUSSION

The status of the findings discussed below depends upon the nature of the sample itself. There are several indications that the FCS is representative of the general population. KAI scores of the FCS members are approximately normally distributed over a range of 54-145 which falls within and is only slightly more restricted than the observed range for the general population. The KAI mean for the FCS is 95.06 (SD 15.52). Adaptors and innovators appear in almost equal numbers in the FCS and their distribution over the observed range of new product purchases (1-8) is not significantly different from the expected frequency distribution (chi-square, with 7 degrees of freedom = 3.82).

The representativeness of the FCS can also be gauged from the proportion of the sample's KAI mean for which each of the subscales accounts. The corresponding proportions of the general population mean can be employed as a guide to the expected O, E, and R proportions of any sample whose mean is known. Since the respective proportions of the U.K. general population sample are 43%, 20% and 37%, the expected subscale means for the FCS can be obtained by multiplying its mean by 0.43, 0.20 and 0.37. The expected subscale means are compared in Table III with the actual figures.

All five hypotheses are accepted and, for ease of exposition, the results are discussed first in terms of inter-sample differences and then in terms of intra-FCS differences on the basis of (a) the number, and (b) the continuity/discontinuity of new brands purchased.

TABLE III. KAI Subscale and Expected Scores

	<u>O scale</u>	<u>SD</u>	<u>E scale</u>	<u>SD</u>	<u>R scale</u>	<u>SD</u>
FCS actual	41.36	7.71	19.00	6.12	34.70	6.99
FCS expected	40.88		19.01		35.17	

As Table IV(a) shows, the difference between the KAI means of the FCS and the female general population is highly significant (as predicted in Hypothesis 1).

In addition, it emerges from Table IV(b) that the KAI means of consumers purchasing four or five new brands varies very significantly from that of the female general population; the means of purchasers of (a) up to three or (b) more than six new brands are, however, indistinguishable from females in the general population. In an attempt to explain this difference, the mean number of reported purchases of each brand over the four months covered in the survey were compared for purchasers of four/five new brands and other consumers (Table V). Purchasers of four/five new brands do not differ from other consumers in the types of product they purchase (except in that they buy the butter substitute less). However, this table reveals that those 4/5s who purchase new brands do so less frequently than the other consumers; this is consistent with the known tendency of innovators to practise greater multi-brand purchasing showing less brand loyalty and greater trial purchasing than non-innovators.

Nor are KAI scores related in any simple, overall manner to the volume of innovative purchasing by FCS members (and this confirms Hypothesis 2). Correlation analysis indicates that there is a positive but extremely weak and non-significant relationship between the number of new brands purchased and KAI scores [3]. The rank order correlation coefficient, $r = 0.091$.

Furthermore, as predicted by the third hypothesis, there is no number of new brands which acts as a cut-off point to distinguish customers in terms of their KAI means (see Table VI(a)).

TABLE IV: KAI Mean Comparisons: of General Female Population vs FCS:

<u>Sample/subsample</u>	<u>KAI</u>	<u>SD</u>	<u>N</u>	<u>t*</u>	<u>One-tailed p</u>
Female general population	90.84	17.82	298		
(a) FCS	95.06	15.25	101	2.272	<0.025
(b) FCS Purchasers of					
1-3 new products	93.83	14.25	60	1.380	n.s.
4 or 5 " "	99.31	15.96	29	2.666	<0.01
6+ new products	90.75	19.48	12	0.016	n.s.

n.s. = not significant at $p < 0.05$ level (in this and subsequent tables)

TABLE V - Mean Number of Purchases of New Products
Made Over Four Months

PRODUCT	4/5	Others	t*
Reduced fat cheese	3.17	5.40	1.319
Cream/vegetable oil spread	1.44	5.16	2.431
Mixed fruit drink	4.87	4.57	0.102
Instant decaffeinated coffee	4.20	5.72	0.601
Mixer sherry	1.00	1.66	1.570
Garlic salad dressing	1.66	3.71	1.553
Cheese sauce granules	1.12	2.12	1.414
Battered haddock steaks	3.66	6.44	0.952
Crunch snack biscuit	5.60	5.96	0.150
Savoury wheat crackers	3.47	6.05	1.542
Fibre-based cereal	3.60	4.62	0.695
Reduced fat sausages	4.10	2.87	0.747
Drinking yoghurt	1.00	3.00	1.639
<hr/>			
WEIGHTED MEAN	3.50	4.73	
ST DEV	5.11	5.23	
N	140	188	

$$t = 2.135^{**}$$

* Only in the case of the cream/vegetable oil spread is the difference significant at $p < 0.05$ (one-tailed test)

**Significant at $p < 0.025$ (one-tailed test)

TABLE VI - KAI Means for FCS, by Number of New Products Purchased

<u>Number of new products purchased</u>	<u>KAI</u>	<u>SD</u>	<u>N</u>	<u>t*</u>
(a)				
1	93.00	4.34	24	
2-8	95.71	15.91	77	0.787
1 or 2	93.12	12.91	39	
3-8	96.29	15.94	62	1.096
1-3	93.83	14.25	60	
4-8	96.87	17.24	41	0.932
1-4	95.07	14.25	70	
5-8	95.67	16.68	31	0.336
1-5	95.61	15.28	89	
6-8	91.00	19.34	12	0.790
(b)				
1-3	93.83	14.25	60	
4-5	99.31	15.96	29	1.571
1-3	93.83	14.25	60	
6+	90.75	19.48	12	0.521
4-5	99.31	15.96	29	
6+	90.75	19.48	12	1.347

*None is significant at the $p < 0.05$ level (one-tailed test)

Nor is the KAI mean of purchasers of four and five new brands significantly different from those of other purchasers (Table VI(b)). However, although the differences noted do not achieve significance at an acceptable level, they are large and in the expected direction.

The fourth hypothesis encourages a deeper investigation of cognitive style and innovative brand choice. Table VII arranges the product categories according to the degree of continuity/discontinuity revealed by the statistical analysis. We first describe how the groupings shown in this table were arrived at and then compare its classification with that suggested by the panel (shown in Table II).

Three new brands (of the crunchy snack bar, the salad dressing and the decaffeinated coffee) were each purchased by respondents whose mean score was significantly greater than (a) that of the female general population - whilst that of purchasers of the established alternative brands was not, and (b) that of purchasers of the corresponding established alternative. These were the same three new brands which the consumer panel had identified as discontinuous.

Six brands (of the savoury wheat crackers, mixer sherry, high fibre cereal, reduced fat sausages, battered haddock steaks, and drinking yoghurt) were purchased by respondents whose KAI means were higher than those of purchasers of the established alternative in each case but not significantly so. In four cases, the means of purchasers of the established brand were significantly greater than that of the female general population, whilst those of the corresponding innovative brand purchasers were not. In the case of the savoury crackers, this pattern was reversed, and in the case of the sherry, purchasers of both innovative and established brands differed significantly from that of

TABLE VII - Product Comparisons

PRODUCT CATEGORIES	Group 1	KAI	SD	N	Comparisons			
					Female General Popul. t	Female General Popul. p*	Comparisons Between Each Pair t	Comparisons Between Each Pair p*
Garlic salad dressing		101.00	12.36	23	3.602	<0.001		
Salad cream		94.31	15.63	78	1.666	ns	2.140	<0.025
Instant decaffeinated coffee		101.40	16.78	27	3.082	<0.001		
Instant coffee		93.79	14.13	74	1.472	ns	2.100	<0.025
Low calorie, sugar free snack biscuit		99.22	15.22	50	3.437	<0.001		
Traditional snack biscuit		92.44	14.48	51	0.687	ns	2.293	<0.025

TABLE VII - Cont....

GROUP 2

	KAI	SD	N	Comparisons	
				Female General Popul. t	Between Each Pair t
				p*	p*
Mixer sherry	99.75	11.39	9	2.247	<0.025
Cream sherry	95.45	15.45	92	2.332	<0.025
Fibre-rich cereal	97.53	15.89	31	0.025	ns
Corn flakes	95.04	14.89	70	1.984	<0.05
Reduced fat sausages	98.00	15.37	28	0.025	ns
Traditional pork sausages	94.97	15.11	73	1.960	<0.05
Battered haddock steaks	97.38	21.41	19	1.297	ns
Breaded fish fingers	95.44	15.22	82	2.262	<0.25
Drinking yoghurt	96.87	16.21	9	1.092	ns
Fruit flavoured milk drink	95.70	15.16	92	2.490	<0.01
Savoury wheat cracker biscuits	98.78	13.66	34	3.045	<0.005
Cream cracker biscuits	94.30	15.75	67	1.545	ns
				1.478	ns

TABLE VII - Cont.....

PRODUCT CATEGORIESGROUP 3

	<u>KAI</u>	<u>SD</u>	<u>N</u>	<u>t</u>	<u>p*</u>	<u>t</u>	<u>p*</u>
Reduced fat cheddar cheese	94.62	13.86	36	1.466	ns		
Traditional cheddar cheese	96.43	15.90	65	2.451	<0.01	0.596	ns
Cream and vegetable oil spread	88.09	17.93	23	0.689	ns		
Butter	97.87	13.73	78	3.625	<0.001	2.368	<0.025
Mixed fruit drink	94.40	18.67	16	0.741	ns		
Established carbonated drink	96.04	14.57	85	2.664	<0.005	0.333	ns
Cheese sauce granules	94.65	17.21	27	1.087	ns		
Cheese sauce packet mix	96.20	14.47	74	2.634	<0.01	0.417	ns

*one-tailed

the female general population. Four of the innovative brands in this group of six had been identified initially by the consumer panel as dynamically continuous.

Finally, there are four new brands (reduced fat cheese, the cream/vegetable oil spread, mixed fruit drink and the cheese sauce granules) which attracted purchasers whose KAI means were, in each case adaptive and not distinguishable from that of the female general population. Their means were also lower in every case than those of purchasers of the established alternatives, though only in the case of the spread was the difference significant. Hypothesis 5(ii) can be accepted only tentatively, therefore. In all four cases, the KAI mean of purchasers of the established brand was significantly higher than that of the female general population. Three of these four brands were among the six classified by the panel as continuous.

The degree of agreement between the classification of the new brands in terms of perceived continuity/discontinuity by the ad hoc panel and the statistical divisions revealed by Table VI is remarkably close. In ten of the 13 product categories, the classifications are identical.

The data were further analysed in order to ascertain whether either of the two classification systems produced significant differences among the groups of products. In the case of the consumer panel's classification, the KAI mean of purchasers who had bought one or more of the three discontinuous brands was significantly greater than that of the female general population; similarly, the mean of purchasers of one or more of the dynamically continuous innovations was significantly greater than that of the female general population. This was not the case, however, for purchasers of the new brands which the panel classed as continuous. Moreover, none of these three groups of

purchasers has a KAI mean which is significantly different from that of any other group (Table VIII).

In the case of the groupings established on the basis of the statistical analysis, a similar pattern of significant and non-significant relationships emerges (Table VIII): the Group 1 mean is significantly greater than that of the female general population, as is that of Group 2, but that of Group 3 is not. The differences between Groups 1 and 3, and 2 and 3 are large and in the expected direction but do not reach conventionally-acceptable levels of significance. The means of Groups 1 and 2 are very similar, but the mean of the combined Groups 1 and 2 is not significantly different from that of Group 3. The mean score of the combined groups is significantly greater than that of the female general population, whilst there is no difference between the means of Group 3 and the female general population.

The results shown in Table VIII are in some degree preordained by the large amount of overlap among the three groups of consumers. Nevertheless, as is especially apparent in the case of the classification derived from observation of the data, the results are in line with the hypothesised patterns. Table IX avoids all overlap by presenting comparisons of those subsamples of consumers who purchased only within each of the three groups of products. Not only are the KAI means of the three groups of consumers significantly different in the hypothesised directions from that of the female general population: in addition, there are significant differences between each of Groups 1 and 2, and Group 3. The samples are, of course, small but the results further encourage the conclusion that KAI is identifying an underlying trend in consumers' patterns of adaptive and innovative responses towards continuously and discontinuously innovative brands.

TABLE VIII - Comparisons of Groups of Innovative Brands

Panel-determined Groups						Groups Determined by Inspection of Data					
<u>Sample/subsample</u>	<u>KAI Mean</u>	<u>SD</u>	<u>N</u>	<u>t</u>	<u>one-tailed p</u>	<u>Sample/subsample</u>	<u>KAI Mean</u>	<u>SD</u>	<u>N</u>	<u>t</u>	<u>one-tailed p</u>
Female General population	90.84	17.82	298			Female general population	90.84	17.82	298		
Group 1 (discontinuous)	97.22	15.19	74	3.119	<0.001	Group 1 (discontinuous)	97.22	15.19	74	3.119	<0.001
Group 2 (dynamically-discontinuous)	96.02	15.22	75	2.541	<0.01	Group 2 (dynamically-discontinuous)	96.95	15.16	71	2.946	<0.005
Group 3 (continuous)	93.36	16.00	61	1.099	ns	Group 3 (continuous)	93.12	15.92	70	1.053	ns
Groups 1 and 2 combined	96.59	15.10	89	3.019	<0.005	Groups 1 and 2 combined	96.81	14.96	87	3.130	<0.001
<u>Inter-subsample Comparisons of Means</u>						<u>Inter-subsample Comparisons of Means</u>					
Groups 1 vs 2				0.482	ns	Groups 1 vs 2				0.107	ns
Groups 2 vs 3				0.985	ns	Groups 2 vs 3				1.463	ns
Groups 1 vs 3				1.427	ns	Groups 1 vs 3				1.579	ns
Groups 1 and 2 combined, vs Group 3				1.099	ns	Groups 1 and 2 combined, vs Groups 3				1.483	ns

TABLE IX - FCS Means of Consumers Who Bought Exclusively
From Group 1 or Group 2 or Group 3

<u>(a) sample/subsample</u>	<u>KAI</u>	<u>SD</u>	<u>N</u>	<u>t</u>	<u>One-tailed p</u>
Female General Population	90.84	17.52	298		
Purchasers Who Bought <u>Only from</u>					
Group 1	99.33	14.12	12	2.021	<0.025
Group 2	98.20	11.47	10	1.954	<0.05
Group 3	83.75	13.09	12	1.812	<0.05
<u>(b) Intra-sample Comparisons of Means</u>					
Purchasers from Group 1 <u>only</u> vs Purchasers from Group 2 <u>only</u>				0.207	ns
Purchasers from Group 2 <u>only</u> vs Purchasers from Group 3 <u>only</u>				0.759	<0.01
Purchasers from Group 1 <u>only</u> vs Purchasers from Group 3 <u>only</u>				2.803	<0.005

CONCLUSIONS

The results which have been presented in this article are very much more encouraging than those produced by the majority of investigations of the personality/consumer choice relationship. Yet a cursory inspection of the data could easily have resulted in a contrary conclusion. Judged superficially on the basis of correlation measures alone, the KAI might be seen as another psychometric test generating findings that bear little relationship to new produce purchasing. The lesson of the analysis reported above is that the actual relationship must be sought in ways more subtle than those which have characterised personality research in marketing. Moreover, the KAI was not a randomly-selected test: it was chosen specially because of its high levels of reliability and its demonstrable predictive validity over a range of behaviours and contexts.

The findings reveal that it provides a useful means of identifying consumer innovators which may amount to a breakthrough in the application of personality theory to the development and marketing of innovations. In particular, it promises to contribute to the applications of diffusion theory which were mentioned in the Introduction as being especially relevant to managerial practice.

First, the highly significant difference between the KAI means of the female general population and the members of the FCS is evidence of the capacity of the test to identify innovation-prone shoppers for consumer nondurables, and thereby contribute to the reduction of uncertainty throughout the new product development process. Secondly, the usefulness of the KAI is further apparent from its ability to isolate the adopters of (a) discontinuous and (b) continuous innovations, both from one another and from female consumers at large. The possibility that adopters and innovators possess profoundly different perceptions of, and react in peculiar ways to continuous and

discontinuous new brands has far-reaching implications for the tailoring of innovations to specific market segments in order to accelerate first adoption and subsequent diffusion. In both respects, the KAI is of interest because it provides the basis of an operational definition of Robertson's qualitative and inescapably subjective classification of innovations in terms of the extent of their disruptive impact on consumption patterns.

There are several opportunities for further research, some of which are currently being pursued by the authors. Given the positive and encouraging nature of the results, the somewhat rough and ready recruitment of the the consumer panel who classified the innovations actually attests to the potency of the KAI, as does the criterion for recruitment of the FCS (purchase of a single innovation on a predetermined list). However, they also suggest that even more clearcut results can be obtained by the use of more closely-defined groups of respondents. One possibility for more specific research arises from the apparently anomolous results obtained for purchasers of four and five innovations. Explanation of the observed curvilinear relationship between the number of new products bought and mean KAI deviations from the female general population norm does not lie in the intrinsic nature of the products consumed. Further investigation may uncover the situational, social, economic and personal influences at work here.

Finally, it is evident that trait explanations of innovative behaviour receive only equivocal support from the findings. Although the KAI mean of purchasers of four and five new brands is significantly different from that of the female general population, whilst that of the purchasers of up to three innovations is not, the unexpectedly adaptive mean of the purchasers of six or more new brands, which is indistinguishable from that of the female general population, argues against the existence of an intrapersonal trait which governs innovative purchasing. The small sample of purchasers of six or more new brands may be responsible for this result, of course, and firm conclusions cannot be

drawn in the absence of further investigation. However, the work reported here should not preclude the search for alternative explanations of consumer innovativeness. In particular, the accumulation of evidence indicating the importance of prior behaviour in similar situations as an explicator of current choice (Foxall 1984b, 1986b) invites investigation of the environmental determinants of innovative decision-making in order to understand more fully the ways in which contingencies of reinforcement affect the generalisation of innovative purchasing across situations (Foxall 1986c). Only when this understanding becomes available may we appreciate why consumers' verbal responses to the KAI inventory are so often consistent with their overt purchasing behaviour.

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FOOTNOTES

[1] Other measures of internal consistency include (Kirton 1986a):

Cronbach Alpha for U.K. general population (N=562) = 0.88,

Cronbach Alpha for Italian general population (N=832) = 0.87,

K-Rs0 for U.S. general population (N=214) = 0.86,

K-R20 for U.S. managers (N=256) = 0.88.

[2] The possibility that adaptors and innovators react differently to changes which lie within the given frame of reference has been suggested in another context by Kirton (1977b) and we are grateful for his assistance in developing this aspect of the theoretical basis of the present paper.

[3] Regressing the number of new products purchased, y , on KAI score, x , gives:

$$Y = 92.66 + 0.79x$$

(3.23) (0.88)

suggesting that KAI is in general an inaccurate predictor of the magnitude of new product purchasing.