

**SOURCES OF INNOVATIVENESS:
AN INTEGRATED EMPIRICAL STUDY**

by

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98/16/MKT
(Revised Version of 96/72/TM)

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Printed at INSEAD, Fontainebleau, France.

Sources of Innovativeness: An Integrated Empirical Study

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February 1998

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Abstract

One of the central planning themes behind innovation launches is the correct identification and understanding of innovators. Motivated by the comprehensive review in Gatignon and Robertson (1985), this paper simultaneously tests various prevailing consumer theories concerning this key segment of consumers. In particular, we address four broad research questions: (i) are there mediation effects across the broad categories of factors hypothesised to affect innovativeness, or do these act independently, (ii) do the variables (hypotheses) suggested in the extant literature reflect independent constructs or are they manifestations of fewer underlying constructs, (iii) across the various forces, which appear to be most relevant in predicting one's proneness to innovate (adopt early), and finally, (iv) do factors affecting innovativeness change across innovations, whether these are new to an entire population or whether these are simply new to a given cohort. Answers to these questions are generated from a study on ten electronics innovations using a sample of some 900 individuals from the innovations' "lead segment". We find that traditional variables used in diffusion research are manifestations of a few factors with appealing theoretical meaning. Consistently with previous research, we also find that perceptions of relative advantage more so than any others drive innovativeness. While relative advantage is found to be a partial mediator for a number of personal factors its dominant effect on innovativeness remains largely unexplained.

Sources of Innovativeness: An Integrated Empirical Study

INTRODUCTION

“To find and understand innovators” has been a perennial quest for innovation managers. Academicians, building from the pioneering works of Arndt (1967), and Robertson (1967, 1971), have not left managers without frameworks to “find” and “understand” this core segment. Beyond characteristics idiosyncratic to a given category, academicians have identified dozens of factors that set innovators apart from later adopters (see Gatignon and Robertson 1985 for a rather exhaustive review). Nearly all of these factors can be grouped into two broad categories of main effects: (1) personal variables, related to the person who adopts the innovation (demographics and psychographics), and (2) product variables (related to the innovation's perceived attributes). Based on these categories, “innovators” can be identified and correctly addressed via the marketing mix (pricing, communications, distribution, and product design).

Because research has progressed in an independent/parallel fashion across authors, the picture given by academic research remains a “composite” – a fuzzy collection of ideas that have not been simultaneously studied. As noted in Gatignon and Robertson, responses to a few central yet unanswered questions can dramatically increase the usefulness of this research stream. First, it is not clear that the two broad categories of variables (personal and product) affect innovativeness independently from one another. Research in psychology has long suggested that perceptions are themselves generated from personal characteristics or traits. In this regard, personal variables suggested in the literature may, in fact, drive perceptions. If so, we may be able to ignore certain perceptual constructs in favour of core drivers. To date, the empirical studies reported in the diffusion literature assume that perceptions are entirely exogenous. Second, there is an open question whether the numerous variables suggested in the literature for each broad category (personal versus product) are really independent from one another, or whether they can be combined into a parsimonious set of focal concepts. Third, assuming that truly independent and valid constructs that affect innovativeness can be developed, the question to the manager becomes: “what is the relative importance of these constructs in explaining consumer innovativeness?” Answering this question could help in focusing on the more relevant factors.

Finally, assuming we have a parsimonious set of constructs and we know which are relatively more important, we need to understand if our model is generalizable across innovations. Does the resulting rules-of-thumb apply only to innovations which are new to the

entire population or might it also apply to “older” innovations which are nevertheless relatively new to a given cohort of consumers facing the purchase decision for the first time? Notice that the latter case is analogous to the problem faced by managers selling “dynamically continuous” or “continuous” innovations, which only require moderate behavioral changes from consumers (Robertson 1967). While radical innovations have been given the lion-share of attention in the literature, it is the latter product form which is the most often created and launched by marketers. For any innovation, there will always be a temporal segmentation structure across consumers. For categories which may already be several decades old, the manager still must understand whether “innovativeness” amongst the current cohort of consumers (e.g. consumers in the 1990s, aged 20 to 25, who are purchasing microwave ovens for the first time and for whom the product represents a continuous innovation) is driven by the same factors that affect innovativeness for that same cohort facing a radical innovation that is new for the entire society (e.g. high definition television). If so, then diffusion theories can be expanded to a far broader class of innovations, namely “cohort” innovations which are existing product categories new to only certain consumer cohorts. These “cohort” innovations are likely to behave as “continuous” or “dynamically continuous” innovations to these consumers as their adoption will not likely result in radical behavioral changes because these consumers would have been indirectly exposed to the innovation from previous cohorts.

This paper hopes to move towards resolution across the questions raised above and which are summarized for later reference as follows:

RQ1: Are there mediation effects across the broad categories of factors hypothesized to affect innovativeness, or do these act independently?

RQ2: Do the variables (hypotheses) suggested in the extant literature reflect independent constructs or are they manifestations of fewer underlying constructs?

RQ3: Across the various forces, which appear to be most relevant in predicting one's proneness to innovate (adopt early)?

RQ4: Do factors affecting innovativeness change across innovations, whether these are new to an entire population or whether these are simply new to a given cohort.

In what follows, we first develop a theoretical framework which allows us to address the above research questions. The result of this exercise is a general model of innovativeness that allows us to test RQ1 to RQ4. Since much of this study replicates earlier works, care is made to

highlight the incremental insights gained in relation to the existing literature. The paper ends with concluding remarks, caveats and suggestions for further research.

THEORETICAL FRAMEWORK

Substantial research has been devoted to understanding the determinants of adoption timing for innovations (see the reviews in Rogers 1983, Gatignon and Robertson 1985 and Holak 1988). The variables used in these studies can be roughly grouped into two categories: (1) characteristics of the consumer (personal factors), and (2) characteristics of the innovation (perceptual factors). Most prior research has focused on main or direct effects. Given the substantial literature dedicated to these main effects, we refer the reader to the reviews cited above for the arguments supporting these relationships. Our first research question (RQ1) considers the long standing assumption that the two broad categories (consumer's personal characteristics and the innovation's perceived characteristics) act independently on innovativeness. In particular, we consider whether personal factors have not only a direct effect on innovativeness but also affect the perceptions of the innovation. This would mean that perceived product factors are (partial) mediators of personal constructs. The strongest arguments in favour of believing that such mediation effects exist come from theories developed in psychology. In particular, human *trait theories* suggest that traits and perceptions are linked. Beginning with the research of Allport (1937), trait theories hold that individual traits are the fundamental building blocks of personality. Furthermore, these traits are the core determinants of an individual to have variances in perceptions of choice alternatives. In the broadest sense, these traits affect basic decisions on whether or not a decision or choice is "good" or "bad". According to modern trait theorists (e.g. Buss and Finn 1987, Mischel 1986), traits not only affect individual perceptions of a situation, but also general pre-dispositions to respond to stimuli and action tendencies. Based on these theories, we have extended the core model of innovativeness to include mediation effects whereby consumer perceptions of an innovation are affected by personal traits or characteristics. Since there are a number of personal and perceptual factors, there may be hundreds of possible mediation effects. Rather than justify each one on a theoretical basis, we broadly consider the existence of "trait effects" and seek to uncover their possible existence. Figure 1 represents this extended model in which personal characteristics may affect innovativeness directly (as suggested by past research) and/or through perceptions as suggested by trait theories.

[Insert Figure 1 about here]

The need to consider mediation effects has been also noted in the diffusion literature. Gatignon and Robertson (p. 864), for example, note that “the literature has been largely concerned with direct relationships or main effects”. The consumer behavior literature commonly finds that perceptions may, in fact, be partially generated by personal factors. For example, certain demographic groups perceive the value of certain products to be higher than others (e.g. young people may tend to perceive high-tech innovations to be more advantageous to alternatives and less complex or “risky”, compared to older consumers). With the exception of Holak (1988) who considers interactions between certain personal and product variables, most authors have treated these first two forces in isolation, or independently. In general, perceptions have been considered to be generated from independent, yet unidentified sources.

With the general theoretical framework proposed above and summarized in Figure 1, we now turn to the methodology used to test research questions RQ2 to RQ4.

GENERAL METHODOLOGY

We define innovativeness as a person’s likelihood to adopt an innovation sooner than others. This contrasts with the view which distinguishes adopters based on sources of communications/information, or their use of internal versus external sources. In our study, the latter factors are considered, but only as they can drive or affect adoption timing. Given this definition, the literature has left managers an almost overwhelming number of variables to consider when they hope to understand consumer innovativeness.

Consumer characteristics affecting innovativeness can be classified into three separate groups: (1) demographics (e.g. age, wealth), (2) psychographics (e.g. attitudes toward various forms of risk) and (3) consumer behaviors (e.g. quality signal usage, information search and shopping behavior, and media use). Perceived innovation characteristics are typically classified in the literature as six independent constructs which follow the acronym ACCORD (see Rogers 1983, p. 15 and Angelmar 1990): (A) relative advantage over alternative innovations, (C) complexity, (C) compatibility with social norms, (O) observability of innovation benefits, (R) social, financial or other risks, and (D) divisibility or pre-use triability. Each of these groups of variables and constructs are often modelled using a number of items. Our second research question (RQ2) asks whether the variables (hypotheses) suggested in the extant literature reflect independent constructs or are they manifestations of fewer underlying constructs? If there is interdependence, we may be able to reduce the number of factors to a parsimonious yet relevant few.

The list of variables considered in our study to cover both consumer characteristics and product perceptions directly follows the recommendation of Gatignon and Robertson (p. 864)

that tests of diffusion theory include “multiple measures of basic innovation adoption constructs”. From an exhaustive review of the literature, a *master list* of constructs or variables was created. In most cases, work in this area has relied on single-item measures acting as proxies for basic constructs, and these measures have been re-used across studies, leading to a number of redundant variables. By integrating the inventory of existing measures, we incorporate multiple measures for each underlying construct (as the same construct has been studied using different single-item measures across studies). For the categories studied, discussed below, this resulted in a battery of over 200 questions. Relying on these extant measures allows us to uncover statistically interdependent factors which then can be compared to the theoretical constructs previously proposed by the diffusion literature. Having a parsimonious set of independent constructs is useful, but does not indicate which are most likely to drive innovativeness. Our third research question (RQ3) asks which of the various factors are most relevant in predicting one's proneness to innovate (adopt early)?

Our study considers the following ten product categories: cellular telephones, pocket pagers, personal computers, video cameras, high definition television, cable television, satellite reception dishes, digital audio tape recorders, video cassette recorders, and microwave ovens. Among the possible alternatives, these innovations were chosen with certain design issues in mind. First, all of the categories are readily recognized by the sample subjects. Second, previous diffusion research has successfully used such innovations to test theories of diffusion, allowing for direct comparison (Holak 1988; Holak and Lehmann 1986). Third, the innovations studied are both dynamically continuous and discontinuous innovations (Robertson 1967) and likely to be subject to diffusion processes. Fourth, using a variety of categories allows us to consider the generalizability of the results. Three categories can be used in either the home or the office (personal computer, cellular phone, pocket pager). Five are visual entertainment oriented with wide variances in prices (high definition television, video cameras, cable television, video cassette recorder and satellite television). One is audio entertainment oriented (digital audio tape recorder) and one is cooking/time efficacy oriented (microwave oven). In addition to usage variance, five innovations are “existing”, but generally new to the current cohort of consumers who constitute our subject population. The other five innovations are classified as “recent innovations”; of these, only two are truly radical (but were well publicized in the popular press – digital audio tape recorders, and high definition television). The three others are dynamically continuous innovations with less than one percent penetration. Again, by having variety, we are able to evaluate if the factors affecting innovativeness change across innovations, whether radical or continuous and/or “new” or “existing” to a given cohort.¹

¹ For existing innovations diffusing within a population cohort, care must be taken to control for the influences of immediate family which may have had tendencies to adopt the innovations in question. As discussed later, we will

IMPLEMENTATION

Consumer and Innovation Sample Requirements

We begin by considering two shortcomings of random-sample-based diffusion research which some authors argue lead to little, if not biased, insights into the forces driving individual adoption timing (Rogers 1983). The first is that random samples will likely pick up an insufficient proportion of "innovators", as these represent, for most innovations, a very small percent of the general population; typical sample sizes, therefore, are generally insufficient to capture a sufficient number of highly innovative consumers. The second criticism is based on early studies relying on random samples finding, for example, that innovators are young, cosmopolitan, educated and economically affluent. In addition to finding that these characteristics reflect interdependent constructs when a whole population is considered (e.g. only the affluent can be cosmopolitan), the innovations studied in this context are purchased almost exclusively, for example, by incomes above a certain threshold. The validity of the results within that particular population segment or social class, are called into question (e.g. higher incomes, cosmopolitanism, etc., may not lead to greater innovativeness). For most innovations, consumer surveys are best conducted within the segment of consumers likely to have a higher than average concentration of innovators (e.g. the highly educated, upwardly mobile, and cosmopolitan consumers in the case of relatively high-priced consumer goods). This social stratum is a primary market for many consumer innovations. The study of innovativeness within this affluent segment is, therefore, of greater academic interest than studies using a given population in general. This allows us to test, for example, whether affluent and cosmopolitan consumers are earlier adopters than equally affluent less-cosmopolitan consumers (or that the more affluent consumers among the cosmopolitan are more prone to early adoption).

Respondents

Based on the methodological concerns stated above and in keeping with the general research questions raised in the introduction, data on the innovations mentioned earlier were collected from 900 graduate students from a business school in Europe. In contrast to the extant literature which universally considers American consumers, our respondents come from 38 countries and

consider the role of interpersonal influences generated from immediate family members (children, spouses, and parents). These influences have been considered in consumer research on non-innovation consumption behavior for high-involvement innovations (see Dubois and Marchetti 1993).

reflect a multinational community of young, affluent consumers.² Respondents are homogenous in some respects due, in part, by the admissions procedure on the basis of age, education, professional experience (3 to 5 years and above), academic potential, and, indirectly, absolute income levels. It must be stressed that similarities on average characteristics does not eliminate variances required for hypothesis tests; i.e. there are both wealthy and middle-class respondents within the sample. Table 1 shows the proportions, means, and standard deviations for various individual measures. The respondents are, on average, highly educated, mobile, young (28 years on average), and mostly single professionals, many of whom own a house/apartment. These individuals represent, therefore, a leading segment for innovations targeted to young households (Zielinski and Ward 1984); this seems especially true in Europe where home ownership is uncommon for this age group. Indeed, the average respondent fits closely with the generic description of innovators and early adopters: "higher income, higher education, younger, greater social mobility" (Gatignon and Robertson 1985, p. 861). With respect to measures of innovativeness, discussed below, we find that within this affluent segment there are clearly "innovators" and "laggards" (i.e. a large proportion of the respondents are not at all innovative and had no propensity to adopt the innovations in question). It is important to state that because we use a sample of fairly affluent consumers, we will not be able to test broad theories of affluence effects on innovativeness.

[Insert Table 1 about here]

The student sample is only valid if the subjects are considered the core segment for marketers in these categories. Interviews with three European electronics manufacturers³ confirmed that the "young, affluent, mobile, cosmopolitan, and highly educated" group is indeed a lead segment for the innovations in question. In the case of the oldest innovation (microwave ovens), this segment represented the lead segment when the innovation was initially launched. Confirming these interviews, for the existing innovations respondents show a higher than average adoption level (compared to total population statistics) within their age groups, by country, for personal computers (averaging 65 percent), video cassette recorders (22 percent) and microwave ovens (32 percent).⁴ This supports our assumption and management assertions that the respondents are actual consumers of the innovations in question, and are a focal segment.

² In unreported analyses, available from the authors upon requests, various tests were undertaken to verify whether culture of origin impacted the study's dependent or independent variables; in general, it did not; we therefore assume that these potential effects are minimal.

³ These included a white goods manufacturer, Calor SA, a home electronics and computer manufacturer, Thompson SA, and a telecommunications firm, Ericsson Radio Systems.

⁴ Aggregate adoption data for these categories, across countries are available from Euromonitor, Ltd.

Finally, the student sample ensures that we study a relatively narrow and well defined age group or cohort. This is an important requirement for studying “cohort” innovativeness which we define as the degree to which individuals, within a social strata, are prone to adopt non-contemporary innovations. By having included “existing” innovations as well as “recent” innovations in our study, we can identify systematic differences across these categories and generate insights about cohort innovativeness, a phenomenon of central interest to managers.

The Questionnaire

A self-administered questionnaire assessing intentions, behaviors and perceptions towards the ten innovations was completed by 941 respondents. Approximately 900 responses were complete and usable for the analysis. Some 25 to 35 minutes were required to complete the questionnaire. Since this was generally the first questionnaire administered to students following their arrival on campus and they were instructed that responses were to be incorporated into future class discussion, there was virtually ubiquitous response. In order to avoid possible campus acclimation biases, or “MBA-oriented” responses, the questionnaire was administered during the first weeks of the academic year.⁵

The instrument design closely follows the work of Holak (1988) and Holak and Lehmann (1986). The questionnaire consisted of three parts. Part 1 obtained purchase intentions and ownership levels for the 10 innovations. Intentions (“how likely is it that you will personally own these items within one year after graduation”) were measured on a 10-point Juster (1966) scale and were used as surrogate measures for innovativeness. This scale has been widely used in the literature (Jamieson 1986; Urban and Hauser 1980; Holak 1988).⁶ We need to caveat our findings to the extent to which we use intention measures, especially for the newer innovations. Bemmaor (1995) has found that for innovations that are known to consumers, there is a strong relationship between intentions and actual behavior. For the more radical innovations, the relationship is weaker; this would be the case for two of our innovations: high definition television and digital audio tape recorders. As discussed later, the variances in novelty of the innovations studied did not systematically affect our results. Finally, intention measures are managerially relevant as these are commonly suggested to use when evaluating the potential for new products (Urban and Hauser 1980).

⁵ In a test which compared two groups of respondents who participated in the study a few weeks apart, we found no significant differences across most independent measures suggesting the absence of acclimation biases.

⁶ To assess innovativeness towards electronics in general, another variable was measured, in a different part of the questionnaire, using a 7-point likert scale: “How likely are you to buy the latest home electronics gadget or innovation?” We also considered an ownership measure of innovativeness: the record of individual ownership for the innovations in question. As almost all students had to move to participate in the programme the analysis with this variable only showed significant results for a few factors (product factors, Family life-cycle and Parent ownership).

The second part of the questionnaire assessed general psychographics (venturesomeness, self confidence, risk aversion, cosmopolitanism; see, for example, Yapa and Mayfield 1978), demographics (age, income, personal wealth, number of children, education) as well as various consumer behaviors (information search habits, information seeking and giving behavior, marketing signal use levels and media proneness; see, for example, Green et al. 1974; Summers 1972). All of the above variables have been included in the questionnaire based on the extant review of the diffusion literature.

A number of items in the questionnaire are not directly based on previous research. First, the questionnaire included items which allow us to control for family influences, especially for the existing innovations. This was done for three reasons. First, many household innovations are consumed by multiple family members; higher usage within an innovative family (i.e. families with innovative parents) may extend innovativeness to all members therein (Robertson 1971; Danko and McLachlan 1983; Dickerson and Gentry 1983; Peters and Venkatesan 1973). Second, these represent major focal points for family discussion and would tend to make members receptive to new ideas in general (Midgley and Dowling 1978). Third, Robertson (1967) notes that discontinuous innovations result in substantial behavioral change which makes their adoption high involvement purchases and subject to multiple decision-makers. To assess family influence on adoption, data were collected on marital status, number of dependants, likelihood to make decisions with spouses, and parent ownership of innovations. Questions - except for the demographic variables, parent ownership and media exposure - were asked on a 7-point likert-scale (1 = behavior not very likely, 7 = very likely); more detailed discussions of the scales used are given in the next section. Most constructs were based on adapted single-item measures used in the extant literature. As multiple measures were used here, these were randomly dispersed within the questionnaire in order to avoid order biases likely to be generated by having within construct questions follow each other in order. Where possible, various measures (education, income, family structure, nationality, etc.) were cross-validated using statistics generated from the business school admission process.

Gatignon and Robertson (p. 864) note that innovators are more likely to respond to change agent (the firm's) actions. To consider these, we have added a class of variables, labelled *Consumer Behavior*, which measure (1) the extent to which consumers use certain marketing actions as signals of quality (see, for example, Rao and Monroe 1988), (2) consumer information search and shopping behavior, and (3) consumer proneness to using various media and information sources prior to adoption. Rogers (1983) hypothesizes that earliest adopters are most affected by change agent communications. Gatignon and Robertson (1985, p. 862) further propose that "the greater the individual's propensity to use mass media or sources external to the immediate social system (relative to interpersonal contacts within the social system), the earlier

the adoption". Similarly, the normative marketing literature has modelled advertising so as to mostly affect earliest adopters (Horsky and Simon 1983). We believe that extending the set of variables by these items provides rich insights for innovation researchers as well as practitioners.

Finally, the third part of the questionnaire asked the subjects to evaluate the innovations on various characteristics (compatibility, relative advantage, complexity, triability, perceived risk and communicability) using a 7-point scale; see, for example, Holak (1985), Holak and Lehmann (1986), Labay and Kinnear (1981), Ostlund (1974), and Rogers (1983). Again, in contrast to most published diffusion surveys, constructs which are multidimensional in nature (e.g. perceived risk, relative advantage) are explored using multiple items. For example, besides directly asking the overall relative advantage of the innovation compared to alternatives, the construct "relative advantage" is also measured in terms of the innovation's potential in reducing physical labor, saving time and providing enjoyment/pleasure. Question ordering was randomized to avoid order biases. Innovation perception questions were followed by media usage measures across seven items: "When deciding to purchase home electronics, which sources of information do you often rely on?" Answers were grouped based on whether the information source was change agent (firm) originated (television advertising, radio advertising, print media advertising, sales persons) or generated from independent sources (personal friends, consumer magazines, expert opinions).

EVALUATING THE CORE MODEL

We now turn to the first two research questions: (i) do the variables reflect independent constructs or are they manifestations of fewer underlying factors and (ii) are there mediation effects across factors? We first apply factor analysis (principal components with varimax rotation) to each of the three conceptually independent variable categories: personal variables, consumer behavior variables, and innovation perception variables. In the case of personal variables, both demographics and psychographics were simultaneously considered in a single factor analysis. Before reporting the inter-dependence of factors and mediation effects, correlations between each factor and innovativeness, for each category, are presented for descriptive purposes.

Personal Variables (Demographics, Psychographics and Consumer Behavior)

Six factors were retained (eigen-value, $\lambda \geq 1$) for the personal variables. The personal variables clearly split into demographic and psychographic factors, allowing us to conclude their independence within this analysis. Table 2 reports the factor structure, the explained variances

by each factor and the member variables' loadings.⁷ The factor structure explains 74% of the overall variance. Each of the demographic factors show strong face validity and, together, represent important concepts that have previously been used to describe individuals on the innovator-laggard continuum: Age, Income, Family Life Cycle, and Education. The two psychographic factors also have strong face validity, but merit commentary. The first, labelled "Venturesomeness" combines scales on how likely the person is to start a new venture, to be generally venturesome, and be self confident. These variables were included to capture different forms of venturesomeness (e.g. financial, psychological, or social). All three variables loaded on the same factor indicating their interrelationship. The variables "number of continents visited" and "number of clubs you are a member of" loaded to the same factor we label "cosmopolitanism". We use this label given that the highest loaded variable is related to extensive travel; persons scoring high on this had generally travelled to more than 3 continents. Persons having travelled most are the least likely to be typical of their cultural origins; i.e. they will be more cosmopolitan. Club membership was included in the instrument to indicate social integration but within our sample appears to be related to travel behavior. Although previous diffusion studies have considered cosmopolitanism (see Yapa and Mayfield 1978), travel experiences studied have generally been limited to travel within a country.

[Insert Tables 2, 3 and 4 about here]

Table 4 reports pairwise correlation of factors with intentions to purchase. Beginning with demographics, the table provides little evidence that income and education and mixed evidence that age and family life-cycle affect innovativeness (family life-cycle is only significant for some existing innovations closely related to the "home"). It is important to draw attention to the fact that the sample is similar on these dimensions so limited insight is given by our analysis on their impact within general populations. However, as these respondents are drawn from a lead, or qualified, segment, the analysis indicates that these demographics are not worthwhile as "within" segment constructs. The dummy variable, Parent Ownership, has a strong consistent and significant effect across innovations. According to Hirschman (1980), greater knowledge leads to innovativeness since less cognitive effort is needed for the adoption. Parent ownership likely leads to more knowledge and may reduce perceived risk related to adoption. With respect to psychographics, (Proposition #23 of Gatignon and Robertson), the data indicate that innovators tend to be venturesome and favourable toward risk, this more being the case for recent innovations.

⁷ Variables not loading on any of the factors or dummy variables are reported separately in Table 2 and were also considered in the analysis.

Four factors explaining 77% of the overall variance are generated from the consumer behavior variables based on the $\lambda \geq 1$ criterion. The literature has suggested that innovators are more receptive to firm's marketing activities, collect more innovation-related information, and also give more information to others. Again, the factor structure reported in Table 2 shows strong face validity. The four measures on signal usage all load on the same factor. Signal usage indicates an individual's willingness to judge an innovation based on impersonal signals or cues (see Dawar and Parker 1994). The Opinion leadership factor combines variables indicating that the individual collects information for impersonal sources (stores and research) and transmits the information to others (giving advice). This loading is consistent with previous findings that opinion leaders are experts within a field by having formed independent opinions; in this case from shopping and research; see Dawar, Parker and Price (1996). The factor Information seeking relates to high price sensitivity, and the individual's desire to collect interpersonal information prior to purchase (from family members or others); see Dawar, et al. (1996). Finally, Media proneness combines the individual's use of both firm-originated and independent information sources. Referring to Table 4, Signal usage and Media proneness are significantly correlated with innovativeness especially for recent innovations (much more so than the factor Opinion Leadership traditionally considered - Table 4). Some of the innovators, therefore, may come from a population that tends to rely on these signals rather than on independent information sources or his/her own judgement (an assumption often used in diffusion modelling; see Horsky and Simon 1983).

According to Figure 1 demographic, psychographic and consumer behavior factors enter the model independently. This has been confirmed by regressions that showed only insignificant relationships between these categories (adjusted R-squared less than 0.01 and insignificant t-statistics for each variable). In our subsequent terminology we will thus call all three of these categories as personal factors and conceptually we refer to dimensions related to the person who is a potential adopter of the innovation.

Product Perceptions

From the six innovation perception variables, only three factors were retained; Table 3 reports variable loadings and the average explained variance by each factor. On average the factor structure explains 78% of the overall variance. The factors reported fulfil the " $\lambda \geq 1$ " criterion for most of the innovations in the analysis. The first factor, Relative Advantage, explained a significant part of the variance (33.9% on average) and was very coherent across innovations. Three variables (relative advantage, enjoyment/pleasure and lifestyle compatibility) loaded consistently and significantly (≥ 0.70) on the factor. In the case of three innovations (Cable TV,

Pocket pager and Mobile phone), two variables, both related to the concept of Advantage (reduces physical labor, time saved), also loaded on this first factor with somewhat smaller loadings (0.60). In the case of High Definition Television (HDTV) communicability also had a significant loading (0.59). The next two factors had a much less consistent factor pattern across innovations. The second one essentially represents Complexity (the variable loads for each of the innovations with the exception of Mobile Phone). "How easy to repair" and "triability" are also important for this factor (they load for five and seven innovations respectively). Finally "obsolescence", "time saved", communicability and "enjoyment/pleasure" also load for a few innovations. The most important variables loading on Factor 3 are "time saved" and "reduces physical labor". Less important (loading for only three innovations) are "triability" and "communicability". Returning to RQ2, it is important to see that the perceived innovation attributes, introduced by Rogers (1983) and summarized by the ACCORD acronym are not statistically independent constructs. They rather seem to represent three underlying factors two of which (Relative advantage and Complexity) are consistent across the innovations studied. It is important to recognize that the variables compatibility and relative advantage may represent different dimensions of the same construct. This interpretation is intuitively appealing since compatibility may be seen as an advantage over other alternatives.

Correlations of the perceptual factors with innovativeness (Table 4) confirm Proposition #27 of Gatignon and Robertson with the exception of complexity. The Complexity factor as well as the variable "complexity" are positively related to innovativeness although the factor contains variables that were found to be positively related to innovativeness previously. Since innovators may find complexity desirable for such innovations, perceived complexity may not affect negatively this segment's adoption timing. Consistently with previous research, perception related variables, especially Relative Advantage dominate personal factors in affecting innovativeness.

Mediation Effects

We now investigate the first research question (RQ1) concerning the interdependence of factors. Figure 1 suggests that the above defined personal factors affect innovativeness directly and/or indirectly through perceptions. Perceptions are thus influenced by personal factors but are not determined by the later. To test for the mediation effect of perceptions we use the method proposed by Baron and Kenny (1986, p. 1177):

"To test for mediation, one should estimate the three following regression equations: first, regressing the mediator on the independent variable; second, regressing the

dependent variable on the independent variable; and third, regressing the dependent variable on both the independent variable and on the mediator. ... To establish mediation the following conditions must hold: first, the independent variable must affect the mediator in the first equation; second, the independent variable must be shown to affect the dependent variable in the second equation; and third, the mediator must effect the dependent variable in the third equation. If these conditions all hold in the predicted direction, then the effect of the independent variable on the dependent variable must be less in the third equation than in the second. Perfect mediation holds if the independent variable has no effect when the mediator is controlled."

The above test was used to assess mediation effects for each innovation. Table 5 summarizes the results.⁸ The first perception factor, Relative Advantage, was found to be a mediator of some personal factors for each of the innovations with the exception of Pocket pager. Factor 2, Complexity, was found to have a mediating effect in the case of Cable TV, DAT and HDTV and finally the third factor was found to be a mediator only for DAT. In most cases the mediation was not "perfect" in the sense defined above. The only personal factor that was mediated by perception factor(s) consistently across innovations is Parent Ownership. For recent innovations, Signal-usage was also somewhat consistent; the significance level in the second regression was much less (*p-value*<0.05, not reported in the table) for DAT and Pocket pager. Cosmopolitanism was mediated in two cases (for Video camera and Satellite TV) as well as Venturesomeness (for PC and Mobile phone).

[Insert Table 5 about here]

Product perceptions therefore, are partly explained by personal factors. Among these, our study clearly shows that family influence has a major role in forming perceptions about an innovation. Family influences substantially reduce perceived adoption risk through increased knowledge and trial. Another interesting conclusion is that people heavily relying on marketing signals are prone to adopt new innovations and these signals (physical appearance, price and brand) also seem to affect innovations through perceptions. In this sense trait theories seem to be supported, for example, in that the trait "signal usage" leads to perceptions favouring innovative behavior. Finally, we note that the mediation effects uncovered appear for both recent and existing innovations (RQ4). The results of diffusion research in this regard are extendable to "existing" innovations facing a given cohort for the first time.

⁸ In Table 5 only the mediation effect of the first product factor is shown because of space limitations and its dominant influence on innovativeness.

Relative Effects

Next we examine the relative effects of the various adoption forces (RQ3). Two models were considered: (1) a full model with all possible effects, and (2) a nested model containing the highest number of significant factors uncovered. The nested models reported in Table 6 are based on likelihood ratio tests between the two models; in all cases, the full models are rejected in favour of the nested alternative ($p\text{-value} > .01$).⁹ In order to gauge the relative importance of the various factors theorized in the literature (RQ3), we begin by looking at the impact of those few personal factors that were not found to be mediated by perceptions. Among these, Family Life Cycle was found to have some effect in the case of PC, Cable TV, Video camera, VCR, Microwave, and HDTV most of which are existing innovations. Age had a direct positive effect in two cases (DAT and Video camera). Cosmopolitanism and Information Seeking had small negative direct effects in the case of Video camera and HDTV respectively. The rest of the personal factors that had a significant correlation with innovativeness in Table 4 (Venturesomeness for instance) were generally found less (or not) significant once the perceptual factors were included in the model. Similar results were found when we averaged across innovations.¹⁰ As in previous research, we, therefore, conclude that perceptual factors dominate personal variables (RQ3). This conclusion holds for both existing and recent innovativeness (RQ4).

[Insert Table 6 about here]

As a final check, we performed forward stepwise regression on the full models. Here again, the perceptual factor Relative Advantage consistently and clearly dominates all other factors. Parent ownership, Family life-cycle, Signal-usage and Venturesomeness are the few other significant forces explaining innovativeness, though the result is less consistent across categories. The explained variance attributed to these later two factors is consistently and substantially less than that of Relative Advantage (partial adjusted R-squared statistics smaller than 10% of the full models'). This result also holds when averaging or aggregating across innovations.

Finally, Table 7 provides a comprehensive summary to the third research question (RQ3): among the various forces, which appear to be most relevant in predicting one's proneness to innovate (adopt early)? Table 7 classifies the relationships on a spectrum from "none" to "strong", based on the statistical tests presented in the study (i.e. no entry signifies no

⁹ The aggregate results using average intention across products and an alternative dependent variable, "likelihood to buy the latest electronic gadget" show similar results.

¹⁰ Interestingly when using the general scale, "propensity to buy the latest electronic gadget" Opinion Leadership became the most important personal factor.

relationship found, whereas "strong" indicates highest explanatory power). As pointed out earlier and confirming previous research, innovation perceptions are strong predictors of innovativeness but variables currently used in diffusion research are not sufficient to explain these perceptions. This holds true for all innovations in the category studied and in particular, the two *types* of innovators considered: "cohort" and "non-cohort". Family Life Cycle has a weak, direct influence mainly on "cohort" innovativeness. Parent Ownership has a strong effect, partially mediated by Relative Advantage. Venturesomeness and Signal usage are shown to have some direct and mediated influence on innovativeness, mostly for recent innovations. Most other personal factors (age, income, education, cosmopolitanism, risk aversion, information seeking and media proneness) hypothesized in the literature have negligible influence on innovativeness for the categories studied (e.g. variances in cosmopolitanism among the lead segment has no effect on innovativeness).

[Insert Table 7 about here]

Summary

Our study's findings can be summarized as follows:

- *Psychographic factors:* Venturesomeness and Financial risk proneness have a positive effect on innovativeness (Proposition #23 of Gatignon and Robertson). The effect of the later is more accentuated for recent innovations. In general, psychographic factors have minimal effects on innovativeness;
- *Demographic factors:* In the present sample Age, Education and Income are unrelated or marginally related to innovativeness. Family Life Cycle positively affects "cohort" innovativeness for existing innovations. Parent Ownership has a significant positive effect on innovativeness;
- *Consumer Behavior factors:* People relying heavily on marketing signals are likely to adopt earlier;
- *Perceptual factors:* Perceived innovation attributes used in diffusion research are components of three orthogonal factors. The first factor is clearly related to Relative Advantage and Compatibility whereas the second factor is related to Complexity (RQ2). Relative Advantage is found to dominate other perceptual factors in explaining innovativeness. The direction of perceptual effects partly supports Proposition #27 of Gatignon and Robertson. For the sample used in this study Complexity was positively related to innovativeness contradicting previous research;
- *Mediation effects:* Parent Ownership and (marketing) Signal-usage were found to be mediated by perceptual factors; the later only in the case of recent innovations. Family Life Cycle was found to have significant direct effects on innovativeness for non-home-office innovations;

- *Relative Effects*: innovation perceptions dominate other factors in explaining adoption timing; these perceptions are partly explained by the family environment. Given the weak link between personal and perceptual factors, perceptions still remain mostly unexplained (RQ1);
- *Cohort Innovativeness*: Family life-cycle affects cohort innovativeness whereas Venturesomeness, Risk proneness and Signal-usage mostly affect innovativeness for recent innovations. Effects of Parent ownership and perceptual factors are similar for recent and existing innovations.

CONCLUDING REMARKS

Our study had two goals. The first is to simplify the “innovativeness story” to a few key lessons that can be easily implemented by managers. The second is to add to our academic understanding of the “innovativeness concept”. With respect to the first purpose, what can we conclude? If the manager wants to identify likely innovators within a broader segment of consumers, she should focus on perceptions. In particular, consumers perceiving the innovation to be of high relative advantage, including the notion of lifestyle compatibility are most innovative. Personal characteristics, including demographics, psychographics and general consumer behaviors are of marginal importance. Who are the consumers likely to have the greatest perception of advantage? The answer to this question remains a mystery. For existing innovations, our study indicates that people perceiving high relative advantage are often members of families which are also innovative (i.e. who own existing or recent innovations). Is it worth targeting the innovators? Yes. Fortunately, our study finds that this group is generally more receptive to marketing media than non-innovators. In addition to beginning interpersonal communications processes, this group will have higher responsiveness to marketing investments than the other segments.

With respect to the academic purpose, our study was inspired by the comprehensive review of Gatignon and Robertson (1985) who call for an integrated study of consumer adoption theories. Our empirical study is based on a battery of over 200 questions generalizing previous constructs used in the literature; our sample also overcomes weaknesses identified earlier by focusing on subjects who are within the lead segment of consumers for the ten electronics innovations studied. Our primary conclusions can be summarized as follows:

- many supposedly independent constructs suggested in the literature, including Rogers’ ACCORD acronym, may, in fact be consistently related across product categories; in particular, perceived compatibility and relative advantage are interdependent;

- there appears to be a strong family effect on innovativeness; the offspring of innovation owners are more likely to be innovators themselves;
- innovativeness is, in part, driven by one's receptiveness to change agent actions (marketing communications), more so than by other personal constructs;
- confirming the extant literature, perceptions more so than any other forces drive innovativeness. Although family influences often explain perceptions, these are only weakly generated by other personal constructs and remain largely unexplained.

While Gatignon and Robertson suggest to approach innovation adoption research in an integrated framework, the disadvantage of having such a large scope comes from the trade-off between breadth and depth. In most of the cases we had to content ourselves with existing scales given the length of the questionnaire. Considering this limitation, our study suggests that further research is needed. In particular greater emphasis should be made on developing causal models which can explain individual-level variances in innovation *perceptions* (i.e. why one individual perceives a tangible innovation to be highly advantageous or complex, while another does not). Three domains may prove useful in this regard. First, additional variables should be considered. Presumably these variables might be able to describe the competitive, social or physical environment of the diffusion process and factors affecting general consumption patterns of the population. Second, even if perceptions are explained to some extent by these variables, market-driven (change agent) factors should also be considered by future research (e.g. firm-level advertising may go beyond generating awareness and actually may affect an individual's innovativeness). Finally, perceptions can be seen as manifestations of causal mechanisms generated at the individual level. As the mechanisms considered in the diffusion literature generally fall short in explaining variances in perceptions, further work in this regard appears warranted.

Finally, we highlighted the fact that managers always face a given cohort of consumers. Within a given cohort, some consumers will adopt earlier than others (i.e. they are more innovative). This cohort, of course, may not even have lived during the introductory phase of the innovation itself. We find that many of the concepts introduced by diffusion theory may be applicable to innovations, even when these are marketed to later cohorts (e.g. the adult population living in the 1960s when, say, microwave ovens were launched). We must see this result with some caution given our study's limited scope (i.e. to ten consumer electronics innovations). Broader attempts to generalize this result to other categories should prove extremely useful.

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FIGURE 1: PERSONAL AND PRODUCT FACTORS AFFECTING INNOVATIVENESS

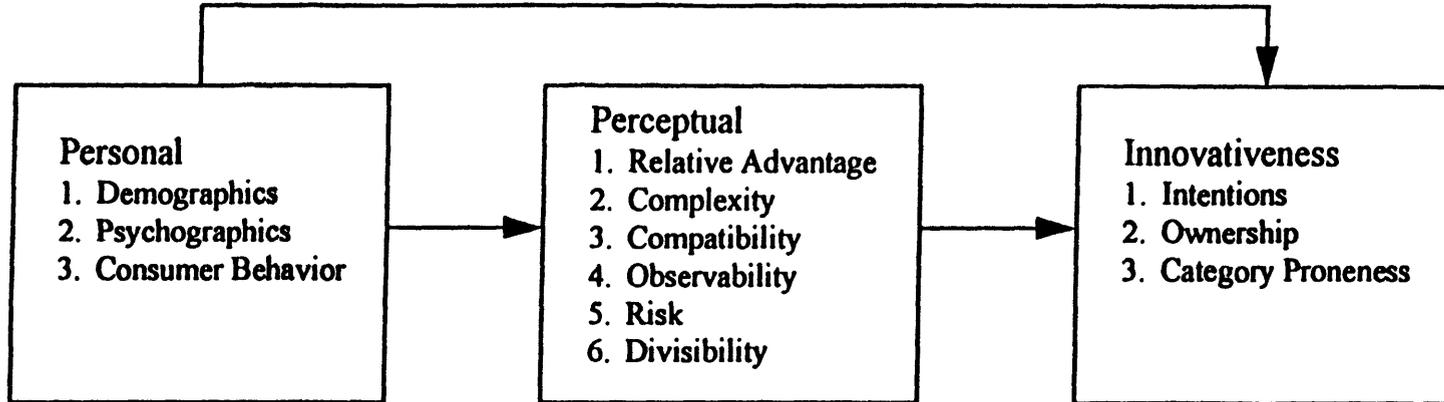


TABLE 1: SAMPLE CHARACTERISTICS

Means, Proportions and Standard deviations (in parentheses)

VARIABLES:	SAMPLE AVERAGES
Age	28.3 (2.45)
Years at university	5.9 (1.46)
Years work experience	4.7 (2.03)
% owning house	47
% owning car	100
PURCHASE INTENTIONS:	
1. PC	8.12 (2.69)
2. Cable TV	4.89 (3.06)
3. Video camera	3.91 (2.92)
4. DAT recorder	3.26 (2.49)
5. Sat. TV dish	2.97 (2.32)
6. VCR	7.08 (3.08)
7. HDTV set	3.52 (2.6)
8. Pocket pager	2.91 (2.18)
9. Mobile phone	4.46 (2.74)
10. Microwave oven	7.66 (2.85)

TABLE 2: PERSONAL AND CONSUMER BEHAVIOR FACTORS

Variable Category	Rotated Factors (% expl. variance)	Variables	Loading
1. Demographics:	Age (15.4)	Age	0.9
		Years of work experience	0.8
	Income (12.5)	Income before the programme	0.9
		Expected income after programme	0.9
	Family Life Cycle (12.0)	Number of houses owned	0.7
		Number of cars owned	0.7
		Number of children	0.5
	Education (10.4)	Number of non-native languages spoken	0.7
		Number of years at university	0.7
	Parent Ownership	(dummy variable)	N/A
2. Psychographics:	Venturesomeness (13.6)	Likely to start a company within one year	0.6
		"How venturesome are you?"	0.8
		"How self confident are you?"	0.5
	Cosmopolitanism (11.4)	Number of continents visited	0.8
		"Number of clubs you are member of"	0.7
	Physical Risk aversion	Likely to play life-threatening sport	N/A
	Financial Risk aversion	Likely to bet on horses or in casino	N/A
3. Consumer Behavior:	Signal- usage (22.9)	Likely to use price as a signal of quality	0.8
		Likely to use brand name as signal of quality	0.8
		Likely to use physical appearance as signal of quality	0.6
	Opinion leadership (21.7)	Number of shops visited before buying	0.6
		Likely to research before buying	0.8
		Likely to give advice to others	0.7
	Information seeking (15.0)	Likely to jointly decide on purchase	0.5
		Likely to seek advice from others	0.6
		Price sensitivity	0.7
	Media proneness (14.3)	Exposure to firm sent information	0.8
Exposure to independent information sources		0.7	

Note: Demographic/Psychographic factors explain 74 % and Consumer behavior factors 77% of the overall variance, respectively

TABLE 3: PRODUCT FACTORS

(Factor loadings and explained variances)

Factor name (% expl. var)	Loading Variables	Existing Innovations					Recent Innovations				
		PC	Cable TV	Video Camera	VCR	Micro Wave	DAT	Sat. TV	HDTV	Pocket Pager	Mobile Phone
Relative Advantage											
(33.9)	Relative Advantage	0.69	0.71	0.76	0.71	0.72	0.73	0.75	0.79	0.72	0.73
	Lifestyle compatibility	0.78	0.78	0.84	0.83	0.81	0.78	0.78	0.71	0.74	0.76
	Enjoyment/Pleasure	0.69	0.68	0.79	0.78	0.54	0.82	0.77	0.79		0.73
	Reduces physical labor	0.53	0.52			0.69				0.71	0.69
	Time saved		0.58							0.63	0.57
	Communicability							0.59			
Complexity											
(24.0)	Complexity	0.61	0.73	0.69	0.66	0.77	0.75	0.71	0.72	0.79	
	How easy to repair	0.61	0.59	0.57	0.67				0.51		
	Triability	0.67		0.66	0.68		0.71	0.53	0.75		0.68
	Obsolescence		0.69			-0.7		-0.57		-0.63	
	Communicability	0.59		0.53							0.68
	Enjoyment/Pleasure									-0.58	
	Time saved					0.84			0.51		
F3: Other											
(20.6)	Complexity										0.76
	Reduces physical labor			0.76	0.75		0.79	0.71	0.81		
	Triability		0.74			0.63				0.64	
	Obsolescence	0.75									
	Communicability		0.83			0.75				0.72	
	How easy to repair					0.59				0.68	
	Time saved	0.75		0.82	0.76		0.83	0.69	0.76		0.51

Note: a.) Only variable loadings larger than 0.5 are reported; b.) Explained variance is averaged across products

TABLE 4: PAIRWISE CORRELATION OF FACTORS WITH INNOVATIVENESS

Factor Name:	% expl. var.	Existing Innovations					Recent Innovations				
		PC	Cable TV	Video Camera	VCR	Micro Wave	DAT	Sat. TV	HDTV	Pocket Pager	Mobile Phone
PERSONAL FACTORS											
1. Demographics											
Age	15.4		-0.08*	.17***			.08*				
Income	12.5										
Family Life-Cycle	12.0			.19***	.09*	.13***					.09*
Education	10.4		.09*		-.11*						
Parent Ownership	N/A		.39***		.21***	.21***	.36***	.24***	.33***		.15***
2. Psychographics											
Venturesomeness	13.6	.17***	.10**				.12***	.09*	.13***	.13***	.25***
Cosmopolitanism	11.4			-.18***				-.08*			.08*
Physical risk aversion	N/A		-.06*								.08*
Financial risk aversion	N/A		.07*		.10**			.10**	.09**	.08*	.10**
3. Consumer behavior											
Signal-usage	22.9		.11***	.08*	.08*	.08*		.12***	.11***		.16***
Opinion leadership	21.7	.13***				.07*				.10**	
Information seeking	15.0					.07*				.08*	
Media proneness	14.3	.09**	.12***					.08*	.11***	.08*	.07*
PRODUCT FACTORS											
F 1: Advantage	33.9 b	.43***	.53***	.60***	.54***	.43***	.43***	.53***	.29***	.43***	.45***
F 2: Complexity	24.0 b		.25***	.15***		.11**	.15***	.09*	.16***		.09**
F 3: Other	20.6 b		.07*	.14***	.08**		.17***	.19***	.16***	.13***	

Note: a.) * : <.05, ** : <.01, *** : <.001 b.) average across products

TABLE 5: ADVANTAGE AS MEDIATOR BETWEEN PERSONAL FACTORS AND INTENTIONS

Regression type:	Existing Innovations					Recent Innovations					
	PC	Cable TV	Video Camera	VCR	Micro Wave	DAT	Sat. TV	HDTV	Pocket Pager	Mobile Phone	
Regress. 1:	R-squared:	0.08	0.07	0.09	0.08	0.09	0.08	0.08	0.06	0.04	0.08
Dep. var.:	Age	-.14***		.12**							
Advantage	Family Life Cycle			.14***							
	Parent Ownership		.40***	.37***	.44***	.32***	.76***	.57***	.40*	.57***	.39***
Indep. var.:	Venturesomeness	-.14***									.16***
Personal factors	Cosmopolitanism		-.15***	-.13***	-.10*			-.12**			
	Signal-usage		.13***	.17***	.15***	.14**	.15***	.17***	.20***	.13**	.18***
	Opinion leadership	.20***					.15***				-.14***
	Information Seeking					.19***					
	Media proneness							.14***			
Regress. 2:	R-squared:	0.05	0.19	0.12	0.06	0.08	0.17	0.1	0.16	0.03	0.13
Dep. var.:	Age			.54***			.28**				
Intention	Family Life Cycle	.23*		.60***		.39***					.25*
	Parent Ownership		2.65***	.62*	1.32***	1.32***	3.65***	1.97***	3.13***		1.22***
Indep. var.:	Venturesomeness	.48***						.30**	.24**		.69***
Personal factors	Cosmopolitanism			-.57***				-.26**			
	Signal-usage							.37***	.35***		.51***
	Opinion leadership	.27*									
	Information seeking					.28*					
	Media proneness	.25*	.30**	.27*							
Regress. 3:	R-squared:	0.19	0.45	0.45	0.31	0.27	0.33	0.38	0.23	0.22	0.31
Dep. var.:	F 1: Advantage	1.03***	1.47***	1.65***	1.56***	1.02***	.90***	1.16***	.63***	.96***	1.16***
Intention	F 2: Complexity		.74***	.38***			.27**	.27***	.30**		.27**
	F 3: Other			.44***			.25**	.46***	.31***	.24**	
Indep. var.:	Age			.36***			.25**				.52***
Personal factors and Advantage	Family Life Cycle	.25*		.46***	.27*	.38***					
	Parent Ownership		1.94***		.73**	1.27***	2.60***	1.46***	2.27***		
	Venturesomeness	.35***									
	Cosmopolitanism			-.36***							.34***
	Signal-usage								.30**		.87**
	Opinion leadership										
	Information Seeking								.32***		
	Media proneness										
Mediated variables:	Venture Oplead	Parent O.	Parent O.	Parent O.	Parent O.	Parent O.	Parent O.	Parent O.	Parent O.	Parent O.	Parent O.
(by Relative Advantage)			Family Ic		Seeking		Cosmop. Signal U.	Signal U.		Venture Signal U.	
			Cosmop.								
			Age								

Note: * : <.05, ** : <.01, *** : <.001

TABLE 6: RELATIVE IMPORTANCE OF PERSONAL AND PRODUCT FACTORS IN EXPLAINING INNOVATIVENESS

(Significant regression coefficients in the retained nested models)

Factor Name:	Existing Innovations					Recent Innovations					Average Intention
	PC	Cable TV	Video Camera	VCR	Micro Wave	DAT	Sat. TV	HDTV	Pocket Pager	Mobile Phone	
R-squared:	0.19	0.46	0.47	0.23	0.29	0.31	0.38	0.36	0.22	0.36	0.32
PERSONAL FACTORS											
1. Demographics											
Age			0.34***			0.23*					
Income											
Family Life-Cycle	0.23*	0.19*	0.43***	0.29*	0.39**			0.19*			
Education											
Parent Ownership		1.91***		0.81**	1.25***	2.63***	1.39***	2.31***		0.83*	1.63***
2. Psychographics											
Venturesomeness	0.36**								0.19*	0.55***	0.20**
Cosmopolitanism			-0.33**								0.19**
Physical risk aversion											
Financial risk aversion											
3. Consumer behavior											
Signal-usage	-0.21*							0.33**		0.33**	0.19*
Opinion leadership											
Information seeking								-0.20*			
Media proneness											
PRODUCT FACTORS											
F 1: Advantage	1.04***	1.49***	1.68***	1.60***	1.04***	0.94***	1.15***	0.65***	0.99***	1.19***	0.97***
F 2: Complexity		0.75***	0.39***		0.26*	0.29**	0.22**	0.34**		0.27*	0.34***
F 3: Other		0.23*	0.43***			0.27*	0.44***	0.33**	0.23*		

Note: a.) Full model has been rejected against the retained model at p=0.01 level.

b.) *: <.05, **: <.001, ***: <.0001

c.) In the case of Average intention the independent variables Parent Ownership and Product factors are averaged across products.

TABLE 7: RELATIVE IMPORTANCE OF FACTORS ACROSS PRODUCTS

Factor Name:	Direct effects	Mediated effects
PERSONAL FACTORS		
1. Demographics		
Age		
Income		
Family Life-Cycle	weak	
Education		
Parent Ownership	strong	strong
2. Psychographics		
Venturesomeness	medium	weak
Cosmopolitanism		
Physical risk aversion		
Financial Risk aversion		
3. Consumer behavior		
Signal-usage	weak	medium
Opinion leadership		
Information seeking		
Media proneness		
PRODUCT FACTORS		
F 1: Advantage	strong	N/A
F 2: Complexity	medium	N/A
F 3: Other	medium	N/A