

Perceptual Change of a New Product, DMB Phone

Kim, Juyoung* · Deok Im Ko**

〈Abstract〉

Digital Convergence means integration between industry, technology, and contents, and in marketing, it usually comes with creation of new types of product and service under the base of digital technology as digitalization progress in electro-communication industries including telecommunication, home appliance, and computer industries. One can see digital convergence not only in instruments such as PC, AV appliances, cellular phone, but also in contents, network, service that are required in production, modification, distribution, re-production of information. Convergence in contents started around 1990. Convergence in network and service begins as broadcasting and telecommunication integrates and DMB(digital multimedia broadcasting), born in May, 2005 is the symbolic icon in this trend.

There are some positive and negative expectations about DMB. The reason why two opposite expectations exist is that DMB does not come out from customer's need but from technology development. Therefore, customers might have hard time to interpret the real meaning of DMB. Time is quite critical to a high tech product, like DMB because another product with same function from different technology can replace the existing product within short period of time. If DMB does not positioning well to customer's mind quickly, another products like Wibro, IPTV, or HSPDA could replace it before it even spreads out.

Therefore, positioning strategy is critical for success of DMB product. To make correct positioning strategy, one needs to understand how consumer interprets DMB and how consumer's interpretation can be changed via communication strategy. In this study, we try to investigate how consumer perceives a new product, like DMB and how AD

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strategy change consumer's perception. More specifically, the paper segment consumers into sub-groups based on their DMB perceptions and compare their characteristics in order to understand how they perceive DMB. And, expose them different printed ADs that have messages guiding consumer think DMB in specific ways, either cellular phone or personal TV.

Research Question 1: Segment consumers according to perceptions about DMB and compare characteristics of segmentations.

Research Question 2: Compare perceptions about DMB after AD that induces categorization of DMB in direction for each segment.

If one understand and predict a direction in which consumer perceive a new product, firm can select target customers easily. We segment consumers according to their perception and analyze characteristics in order to find some variables that can influence perceptions, like prior experience, usage, or habit. And then, marketing people can use this variables to identify target customers and predict their perceptions.

If one knows how customer's perception is changed via AD message, communication strategy could be constructed properly. Specially, information from segmented customers helps to develop efficient AD strategy for segment who has prior perception.

Research framework consists of two measurements and one treatment, O1 X O2. First observation is for collecting information about consumer's perception and their characteristics. Based on first observation, the paper segment consumers into two groups, one group perceives DMB similar to Cellular phone and the other group perceives DMB similar to TV. And compare characteristics of two segments in order to find reason why they perceive DMB differently.

Next, we expose two kinds of AD to subjects. One AD describes DMB as Cellular phone and the other Ad describes DMB as personal TV. When two ADs are exposed to subjects, consumers don't know their prior perception of DMB, in other words, which subject belongs 'similar-to-Cellular phone' segment or 'similar-to-TV' segment? However, we analyze the AD's effect differently for each segment.

In research design, final observation is for investigating AD effect. Perception before AD is compared with perception after AD. Comparisons are made for each segment and for each AD. For the segment who perceives DMB similar to TV, AD that describes

DMB as cellular phone could change the prior perception. And AD that describes DMB as personal TV, could enforce the prior perception.

For data collection, subjects are selected from undergraduate students because they have basic knowledge about most digital equipments and have open attitude about a new product and media. Total number of subjects is 240.

In order to measure perception about DMB, we use indirect measurement, comparison with other similar digital products. To select similar digital products, we pre-survey students and then finally select PDA, Car-TV, Cellular Phone, MP3 player, TV, and PSP.

Quasi experiment is done at several classes under instructor's allowance. After brief introduction, prior knowledge, awareness, and usage about DMB as well as other digital instruments is asked and their similarities and perceived characteristics are measured. And then, two kinds of manipulated color-printed AD are distributed and similarities and perceived characteristics for DMB are re-measured. Finally purchase intension, AD attitude, manipulation check, and demographic variables are asked. Subjects are given small gift for participation. Stimuli are color-printed advertising. Their actual size is A4 and made after several pre-test from AD professionals and students.

As results, consumers are segmented into two subgroups based on their perceptions of DMB. Similarity measure between DMB and cellular phone and similarity measure between DMB and TV are used to classify consumers. If subject whose first measure is less than the second measure, she is classified into segment A and segment A is characterized as they perceive DMB like TV. Otherwise, they are classified as segment B, who perceives DMB like cellular phone.

Discriminant analysis on these groups with their characteristics of usage and attitude shows that Segment A knows much about DMB and uses a lot of digital instrument. Segment B, who thinks DMB as cellular phone doesn't know well about DMB and not familiar with other digital instruments. So, consumers with higher knowledge perceive DMB similar to TV because launching DMB advertising lead consumer think DMB as TV. Consumers with less interest on digital products don't know well about DMB AD and then think DMB as cellular phone.

In order to investigate perceptions of DMB as well as other digital instruments, we apply Proxscal analysis, Multidimensional Scaling technique at SPSS statistical package.

At first step, subjects are presented 21 pairs of 7 digital instruments and evaluate similarity judgments on 7 point scale. And for each segment, their similarity judgments are averaged and similarity matrix is made. Secondly, Proxscal analysis of segment A and B are done. At third stage, get similarity judgment between DMB and other digital instruments after AD exposure. Lastly, similarity judgments of group A-1, A-2, B-1, and B-2 are named as 'after DMB' and put them into matrix made at the first stage. Then apply Proxscal analysis on these matrixes and check the positional difference of DMB and after DMB.

The results show that map of segment A, who perceives DMB similar as TV, shows that DMB position closer to TV than to Cellular phone as expected. Map of segment B, who perceive DMB similar as cellular phone shows that DMB position closer to Cellular phone than to TV as expected. Stress value and R-square is acceptable.

And, change results after stimuli, manipulated Advertising show that AD makes DMB perception bent toward Cellular phone when Cellular phone-like AD is exposed, and that DMB positioning move towards Car-TV which is more personalized one when TV-like AD is exposed. It is true for both segment, A and B, consistently. Furthermore, the paper apply correspondence analysis to the same data and find almost the same results.

The paper answers two main research questions. The first one is that perception about a new product is made mainly from prior experience. And the second one is that AD is effective in changing and enforcing perception. In addition to above, we extend perception change to purchase intention. Purchase intention is high when AD enforces original perception. AD that shows DMB like TV makes worst intention.

This paper has limitations and issues to be pursued in near future. Methodologically, current methodology can't provide statistical test on the perceptual change, since classical MDS models, like Proxscal and correspondence analysis are not probability models. So, a new probability MDS model for testing hypothesis about configuration needs to be developed. Next, advertising message needs to be developed more rigorously from theoretical and managerial perspective. Also experimental procedure could be improved for more realistic data collection. For example, web-based experiment and real product stimuli and multimedia presentation could be employed. Or, one can display products together in simulated shop. In addition, demand and social desirability threats of internal validity

could influence on the results. In order to handle the threats, results of the model-intended advertising and other “pseudo” advertising could be compared. Furthermore, one can try various level of innovativeness in order to check whether it make any different results (cf. Moon 2006). In addition, if one can create hypothetical product that is really innovative and new for research, it helps to make a vacant impression status and then to study how to form impression in more rigorous way.

Key words: MDS, DMB, perception change, Advertising effect, Correspondence analysis

数字多媒体广播手机的感受变化

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<摘要>

数字化集成是指工业、技术和内容的集成。营销领域中，在以数字化进程为代表的数字技术基础上它通常会产生新的产品和服务，这一进程体现在包括电讯、家庭应用和计算机产业在内的电子通信产业。数字化集成不仅表现在像个人电脑、视频和蜂窝电话等工具，还体现在那些需要信息生成、修改、分配和再生成的内容、网络和服务。内容集成始于1990年；网络和服务集成始于广播和通讯的集成；而诞生于2005年5月的数字多媒体广播是这一趋势的象征。

对于数字多媒体广播有积极和消极的两种观点。这是因为数字多媒体广播是技术发展的产物，并非是客户的需要催生的。因此消费者可能会比较难以理解数字多媒体广播的含义。时间能够考验像数字多媒体广播这样的高科技产品，因为采用不同技术的具有相同功能的产品能在短期内代替现有产品。如果数字多媒体广播不能很快在消费者观念占有一席之地，其它产品，像Wibro，IPTV和 HSPDA会在它扩散之前就替代它。

因此，定位策略对数字多媒体广播产品的成功至关重要。要想制定正确的定位策略就必须了解客户如何理解数字多媒体广播和如何通过沟通策略改变客户的理解。本研究将探究客户是如何接受一个新产品，如数字多媒体广播，广告策略是如何改变客户的感受。本研究还将进一步根据他们对数字多媒体广播的感受进行客户细分，比较他们的特征，从而了解他们是如何接受数字多媒体广播；给客户展示有引导他们关注如蜂窝电话和个人电视等各种形式的数字多媒体广播的内容的广告。

研究问题1：根据客户对数字多媒体广播的感受划分客户，比较每个客户细分群体的特征；

研究问题2：比较每个客户群看完不同类型数字多媒体广播的广告之后的感受。

如果能够理解并预测客户对新产品的感受，公司就会比较容易的选择目标客户。我们根据他们的感受划分客户并分析他们的特征，用来发现诸如以往经历、使用和习惯等能影响感受的变量。这样营销人员就能够用这些变量鉴别目标客户和预测他们的感受。

如果能够了解如何通过广告改变客户感受，就能够恰当地设计沟通策略。细分客户的结果也有助于开发针对不同客户的有效的广告策略。

研究框架包括两个测量和一个试验。第一个观测用来搜集客户的感受和特征的信息。在第一个测量的基础上，本研究把客户分为两组，一组感受类似于蜂窝电话的数字多媒体广播，另一组感受类似于电视的数字多媒体广播。然后比较两组客户特征，从而发现为什么他们会有不同的感受。

接下来我们给被试展示两种广告。一种广告把数字多媒体广播描述为蜂窝电话，另一个描述为个人

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电视。当两个广告被展示给被试时，消费者并不知道他们的感受，换句话说不知道被试属于“类蜂窝电话”组还是“类电视”组？但是我们会分析广告对每个群体的不同作用。

研究设计中最终的观察是研究广告效应。广告前的感受与广告后的感受相比较。每组和每个广告都进行比较。在感受类似电视的数字多媒体广播的客户中，把数字多媒体广播描述为蜂窝电话的广告改变先前的感受。把数字多媒体广播描述为电视的广告会强化先前的感受。

选择大学生作为被试，因为他们有数字设备的基本知识，并且对新产品和媒体的态度比较开放。一共有240个被试。

为了测量对数字多媒体广播的感受，我们使用直接测量，与其他相似的数字产品比较。为选择相似的数字产品，我们预先调查了学生，最终选择了PDA, Car-TV, Cellular Phone, MP3 player, TV, and PSP.

Quasi 试验在几个班进行。在简要介绍、以往知识、提示和数字多媒体广播使用之后，测量他们的共性和感受特征。接着两种设计好的彩色广告被使用，再次测量共性和感受特征。最后购买倾向、广告态度、设计检查和人口变量被采集。

研究的结果包括，根据客户对数字多媒体广播的感受把客户分成两组。数字多媒体广播和蜂窝电话的相似性测量与数字多媒体广播和电视相似性测量用来进行客户分类。如果被试的第一个测量少于第二个测量，她会被划分到A组，A组的特征是他们感受数字多媒体广播像电视，否则会被分到感受数字多媒体广播像蜂窝电话的B组。

判别分析他们的使用和态度特征，结果发现A组更多地了解数字多媒体广播，使用过很多数字设备。B组不是很了解数字多媒体广播，不熟悉数字设备。因此，有更多知识的消费者感受数字多媒体广播类似于电视，因为数字多媒体广播的广告使他们将数字多媒体广播作为电视。对数字产品不感兴趣的消费者不很了解数字多媒体广播广告，他们认为数字多媒体广播就是蜂窝电话。

为了研究数字多媒体广播和其他数字设备的感受，我们使用了Proxscal分析，多维量表和SPSS统计软件包。

第一步，向被试展示21对数字设备，用7点量表评估他们的相似性。对每组被试，求他们相似性判断的均值，构造相似度矩阵。第二步对A和B组进行Proxscal分析。第三步，在展示广告之后再测量数字多媒体广播与其他数字设备的相似度。最后，将A-1, A-2, B-1, B-2组被命名，把他们置于第一步建立的矩阵。

结果显示A组的特征是将数字多媒体广播的定位更接近于电视而非蜂窝电话，B组则将数字多媒体广播定位更接近于蜂窝电话而非电视。

实验刺激带来了变化，类似蜂窝电话的广告展示后，对数字多媒体广播的感受倾向于蜂窝电话；类似电视的广告展示后，对数字多媒体广播的定位趋向于车载电视。这一结果适用于A组和B组。

研究结果回答了两个主要问题。首先，对新产品的感受主要来源于以往的经历。其次，广告能有效地改变或者强化这种感受。除此之外，我们将感受扩展到购买倾向，当广告强化原有感受时，购买倾向高；把数字多媒体广播表现为电视的广告会削弱购买倾向。

本研究的局限和问题在于，方法上，现在的方法不能进行感受变化的统计检验。其次，应该从理论和实践上更严谨地设计广告内容。实验过程应该改进，以便更多的真实数据被搜集。此外，需求和社会环境影响内部效度。还有可以创造一个假设的创新产品，可以更严谨地研究印象是如何形成的。

关键词：MDS, 数字多媒体广播, 感受改变, 广告效应, Correspondence analysis

DMB 폰을 대상으로 한 신제품 인식의 변화에 대한 연구

김주영* · 고덕임**

〈한글 요약〉

본 논문은 컨버전스 제품이 시장에 처음 나타났을 때 소비자들이 어떻게 컨버전스 제품들을 인식하고 또, 기업에서 소비자들의 인식을 변경하고자 광고를 냈을 때 어떻게 인식이 변경되는지를 연구하고자 하였다. 컨버전스 제품으로는 DMB 서비스를 대상으로 하였으며, 지상파 DMB 서비스가 출시되기 전에 조사를 시행하였다.

연구를 위하여 자료는 대학생들을 대상으로 수집하였다. 먼저 DMB와 관련된 멀티미디어 기기들과의 유사성 및 속성평가를 통하여 DMB에 대한 인식조사를 하였으며, 기본적인 멀티미디어 기기 사용현황을 조사 하였다. 그후에 조사대상을 무작위로 구분하여 소비자 인식을 변화시키기 위하여 만든 2가지 광고물을 따로 보여주고, 역시 DMB와 다른 멀티미디어 기기들과의 유사성 및 속성평가를 다시 하게 하였다.

분석순서는 먼저 광고물을 보여주기 전에 DMB를 어떻게 인지하는지를, 즉 휴대폰과 비슷하게 생각하는 집단과 TV와 비슷하다고 생각하는 집단으로 구분하고, 판별분석을 통하여 두 집단을 가장 잘 구분하는 변수를 찾아보았다. 결과로, DMB를 알고 있는지의 여부와 휴대폰과 MP3를 사용하는 빈도수가 가장 유의한 변수로 판명되었다. 소비자 집단의 DMB에 대한 인식의 차이는 조사 시행 전에 위성 DMB의 광고를 알고 있는, 사전지식이 있는 사람과 그렇지 못하고, 휴대폰과 MP3를 단순히 많이 사용하는 사람들의 차이인 것으로 나타나서 사전지식이 광고전 인식을 결정하는데 가장 크게 영향을 미치는 요인이었다.

그다음에 인식의 변화를 알아내기 위하여 Proxscal과 Correspondence 분석을 하였다. 두 분석은 서로 다른 알고리즘을 채택하고 있지만 마케팅에서 가장 많이 사용되고 있는 분석이다. 결과적으로 DMB를 휴대폰과 비슷하다고 느끼게 하는 광고는 포지셔닝맵에서의 DMB의 위치를 휴대폰과 가깝게 움직이게 해주고, TV와 비슷하다고 느끼게 하는 광고는 DMB의 위치를 TV에 가깝게 움직여주는 것이 확인되었다. 이는 Proxscal과

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Correspondence 분석 모두에서 나타난 결과이다.

추가적으로 광고를 본후에 DMB 서비스에 대한 사용의도가 각 집단별로, 각 광고별로 어떤 차이가 있는지를 분석하여 보았다. 결과적으로 보니 TV와 비슷하다고 처음에 생각한 집단에게 TV와 유사하게 느끼게 하는 광고를 해주는 것이 가장 서비스 이용희망이 높았고, 두 번째로는 휴대폰과 비슷하다고 처음에 생각한 집단에게 휴대폰과 유사하다는 광고를 해주는 것이 그 다음으로 높았다. 처음생각과 다른 광고를 보여주는 것은 서비스이용희망을 낮게 하였다. 하지만 이런 차이의 통계적인 유의도는 높지 않았다.

본 분석은 일상적으로 마케팅전략에서 언급되던 상황을 실제로 검증하고, 실무자들도 실제로 효과를 명확하게 분석할 수 있는 방법을 제시한 논문이라고 할 수 있다. 하지만 좀더 엄격한 모수 통계적인 검증을 제시하지 못한 한계가 있다. 또한 DMB서비스가 처음 나온 시점이 아니라 위성DMB는 시범서비스를 하고 광고도 일부 진행되었던 시점이기 때문에 컨버전스 제품의 제품 특징만을 보고 소비자의 인식점을 찾지 못했다는 것도 한계점으로 지적할 수 있겠다. 다음 연구에서는 통계적인 분석방법과 보다 다양한 컨버전스제품을 대상으로 연구가 진행되어야 할 것이다.

주제어: 다차원척도법, DMB, 인식변화, 광고효과, 대응일치분석

Perceptual Change of a New Product, DMB Phone

Kim, Juyoung* · Deok Im Ko**

I . Introduction

Digital Convergence means integration between industries, technology, and contents (Hanson 2000). As digitalization progresses in electro-communication industries including telecommunication, home appliance, and computer industry, digitalization in marketing comes with creation of new types of product and service under the base of digital technology (Wind and Mahajan 2002). One can see digital convergence not only in instruments such as PC, AV appliances, cellular phone, but also in contents, network, service that are required in production, modification, distribution, re-production of information (Covell 2000). Convergence in contents started around 1990. Convergence between network and service begins as broadcasting and telecommunication integrates. DMB (digital multimedia broadcasting), born in May, 2005 is the symbolic icon in this

trend (Song et.al. 2005).

There are some positive and negative expectations about DMB. Two opposite expectations exist because DMB does not come out from customer's need but from technology development. Convergence product could make all possible new interaction between various ingredients converged in addition to their main functions (Kim et.al. 2005; Bayus et.al. 2000). Therefore, customers might have hard time to interpret the real meaning of new converged product, like DMB. By the way, time becomes quite critical for high tech product to make successful market performance because other products with same function from different technology can replace it within short period of time. If DMB does not positioning well to customer's mind quickly, another products like Wibro, IPTV, or HSPDA could replace it before it even spreads out (Yi 2005; Lee 2005).

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Therefore, positioning strategy is essential for success of DMB. To construct proper positioning strategy, one needs to understand how consumer interprets DMB and how consumer's interpretation can be changed via communication strategy (Ries and Ries 1999; Aaker and Shansby 1982). If one understands and predicts direction in which consumer perceives a new product, firm can select target customers easily. Consumers are segmented according to their perception and analyze characteristics in order to find some variables that can influence perceptions, like age, sex, usage, or habit. And then, marketing people can use these variables to identify target customers and predict their perceptions. If one knows how customer's perception is changed via AD message, communication strategy could be constructed properly. Specially, information from segmented customers helps to develop efficient AD strategy for segment that has prior perception.

In this study, the article tries to investigate how consumer perceives a new product, like DMB and how AD strategy changes consumer's perception. More specifically, consumers are segmented into sub-groups based on their DMB perceptions and compare their characteristics in order to

understand how they perceive DMB at first impression. Then expose them different printed ADs that have messages guiding consumer think DMB in specific ways, either cellular phone or personal TV.

Another purpose of this study is to provide measure of perceptual change. Previous research uses direct measure on attribute rating. However the paper employs multidimensional scaling to identify perceptual change. The paper suggests interesting method of augmenting data in order to find move of DMB after AD. In traditional multidimensional scaling model, one can't compare and find difference from outputs before and after AD, since positions of two outputs are not comparable. The research questions of this paper can be summarized as follows.

Research question 1: Segment consumers according to perceptions about DMB and compare characteristics of segmentations.

Research question 2: Compare perceptions about DMB before and after AD that guide categorization of DMB into a specific direction.

Research question 3: Utilize MDS to measure the change of perceptions of DMB

II . Research Framework

1. Literature Review

There is rich literature about how consumers evaluate a new product like DMB (e.g., Gregan-Paxton et.al. 1997; Moreau, Markman, and Lehmann 2001; Moreau, Lehmann, and Markman 2001; Bolton 2003). Categorization research provide fundamental ground for understanding how consumer perceives a new product (Sujan and Bettman 1989; Loken 2006; Aaker and Keller 1990). Consumers use category information of most similar product to infer characteristics of new product rather than use attribute information to figure out meaning of new product (Gregan-Paxon et.al. 1997). In addition to similarity, assimilation and contrast are also used to classify new product into existing categories and also to infer characteristics of new product (Hafner 2004). There also exists wide range of research that explain factors about adopting innovation, like group memberships (Bagozzi and Lee 2005), and switching cost from previous products (Koh et.al. 2008).

Assigning a really new product into existing categories and inferring evaluation

from categories is not an easy task when there is no existing category whose exemplar or prototype is similar to the new product. Furthermore, there are many levels of categories and many procedures to identify categories and different levels of transferability in category information (Basu 1993; Gregan-Paston et.al. 1997; Gregan-Paxon et.al. 2005).

Another interesting fact about a really new product categorization, like DMB, is that the first impression or judgment is important, which was appeared in language learning (Markman 1987, 1989; Schmidt and Sherman1984). In addition, Moreau, Markman, and Lehmann (2001) showed that the first categorization of new product without schema can be changed if vivid contrast with clear evidence or explanation. So they show consumers use multiple sources of information to categorize a really new product. Consumers may assimilate or accommodate new information with existing prior knowledge of products (Sujan and Bettman 1989; Holmes and Crocker 1987).

Bolton (2003) extended the research into investigation about how people process new information when existing information is presented. She found that

prior belief created by non-analytic thinking, like scenarios and analogies doesn't change much even after counter information and thinking, including traditional analytical and non-analytical method. Her research also shows quite robust research methodology using scenarios story telling and writing task. However, consumers' judgments for buying situation would be less serious and go through lighter elaboration than the task of business manager. So, study on consumers' judgments may need to focus situation how consumer change perception by conventional marketing tools, like advertising. Ha and Huh (2005) finds that non-analytical information in advertising has strong effect on changing belief without order effect.

In this paper, non-analytical scenario typed printed advertising is used to manipulate categorization of new product, DMB. However, the first impression of DMB isn't manipulated, rather the first perception of DMB is measured and then try to change it by advertising. So, our approach is different from that of other research that manipulates subject's thinking from the first information (Bolton 2003; Ha and Huh 2005).

Also, the paper is going to use

different methodology to measure the categorization. Previous research uses direct measure about categorization, like 'choose category for new product', or indirect measure, like 'where would you buy new product.' The paper is going to use a different kind of indirect measure, multi-dimensional scaling models. One might think that tree type scaling model is more apt in categorization, however, categorization of really new product is not solid, metric representation technique would represent subtle change in categorization. Therefore popular multidimensional scaling(MDS) technique, Proxscal and Correspondence analysis in SPSS are used (Greenacre 1984; Hoffman and Franke 1986). Proxscal utilizes paired comparison data and correspondence analysis utilized attribute data for each objects evaluated by subjects. Since the paper uses non-analytical advertising, Proxscal could represent change in categorization better than correspondence analysis.

However, Proxscal analysis like other metric MDS model usually can't produce comparable outputs for different data set. Since location of one object in MDS output is affected from every objects in the data set, change in one product characteristics could make whole different

output. Therefore in testing purpose, the paper only re-measures the one product-related information while using other previous measures.

2. Research Design

For data collection, research design consists of two measurements and one treatment, O1 X O2, as shown in Figure 1.

The first observation is for collecting information about consumer's perception and their characteristics. Based on the first observation, consumers are segmented into two groups, one group perceives DMB similar to Cellular phone and the other

group perceives DMB similar to TV. And compare characteristics of two segments in order to find out reason why they perceive DMB differently.

Next, two kinds of advertisings (ADs) are exposed to subjects. One AD describes DMB as Cellular phone and the other AD describes DMB as personal TV. When two ADs are exposed to subjects in data collection, researcher don't know their prior perception of DMB, in other words, which subject belong 'similar-to-Cellular phone' segment or 'similar-to-TV' segment? In data analysis, research can analyze the AD's effect differently for each segment.

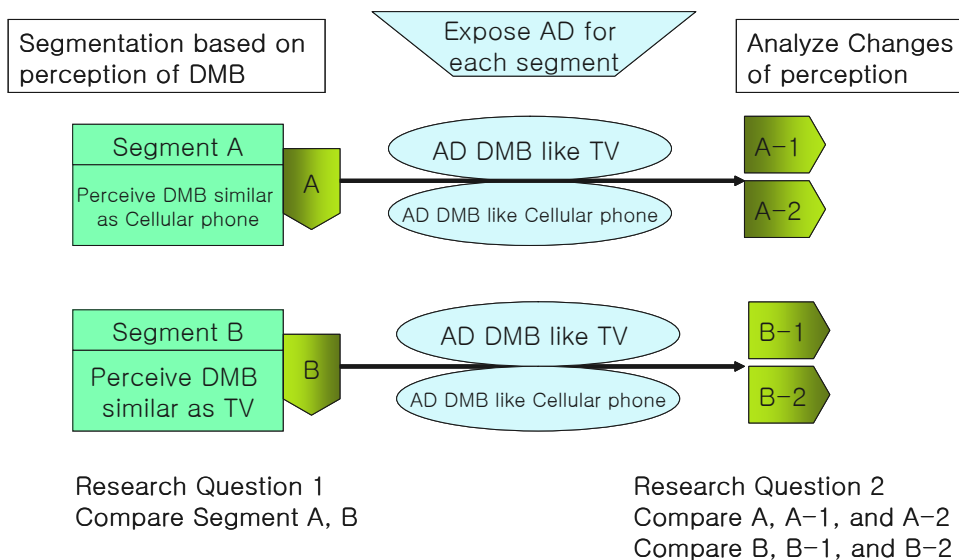


Figure 1. Research Framework

Final observation is for investigating AD effect. Perception before AD is compared with perception after AD. Comparisons are made for each segment and for each AD. For the segment who perceives DMB similar to TV, AD that describes DMB as cellular phone could change the prior perception. And AD that describes DMB as personal TV, could enforce the prior perception. The research design can provide proper scheme to analyze these comparisons.

III. Data Collection and Stimuli

1. Data collection and subjects

Subjects are selected from undergraduate students because they have basic knowledge about most digital equipments and have open attitude about a new product and media. Total number of subjects is 240 and their brief demographic

description is shown at Table 1.

In order to measure perception about DMB, indirect measurements are used comparison with other similar digital products. To select similar digital products, we pre-survey students and then finally select PDA, Car-TV, Cellular Phone, MP3 player, TV, and PSP.

Quasi experiment is done at several classes under instructor's allowance. After brief introduction, prior knowledge, awareness, and usage about DMB as well as other digital instruments is asked and their similarities and perceived characteristics are measured. Similarity judgments are measured by 7 points rating scale of paired comparison. Perceived characteristics data is measured by 7 point rating scales of each digital instrument on four attributes, mobility, personalization, multi-function, and interactive channel. And then, two kinds of manipulated color-printed AD are distributed and similarities and perceived characteristics for DMB are

Table 1. Demographics Of Samples

sex	female 76, male 164
age	20 ~ 25: 191 (79.6%), 26 ~ 30: 36 (15%)
education	undergraduate: 238 (99.2%)
job	student: 235 (97.9%)
pocket money (10,000won)	20 ~ 40: 141 (58.8%), 40 ~ 60: 42 (17.5%)

re-measured. Finally purchase intension, AD attitude, manipulation check, and demographic variables are asked. Subjects are given a small gift for participation.

2. AD manipulation

Figure 2.A and Figure 2.B show manipulated color-printed Advertising. Their actual size is A4 and they are made after several pre-test from AD professionals and students. Figure 2.A is AD that describes DMB as phone and Figure 2.B is AD that describes DMB as personal TV. As mentioned before, AD stimuli are designed to promote non- analytical processing with scenario typed message.

subgroups based on their perceptions of DMB. Similarity measure between DMB and cellular phone and similarity measure between DMB and TV are used to classify consumers. If subject whose first measure is less than the second measure, she is classified into segment A and segment A is characterized as they perceive DMB like TV. Otherwise, they are classified as segment B, who perceives DMB like cellular phone.

Discriminant analysis on these groups with their characteristics of usage and attitude shows that Segment A knows much about DMB and use a lot of digital instrument. Segment B, who think DMB as cellular phone don't know well about DMB and not familiar with other digital instruments. So, consumers with higher knowledge perceive DMB similar to TV. This is because launching DMB advertising shown to public, led consumers who are interested in new trend think DMB as TV. Consumers with less interest on digital products don't know well about DMB AD and then think DMB as

IV. Results

1. Compare characteristics of segments based on perception of DMB

Consumers are segmented into two

Table 2. Classification Of Segments

Classification criteria	number	Characteristics
Similarity (DMB - C.P.) - Similarity(DMB - TV) < 0 (Segment A)	169	DMB is similar to TV
Similarity (DMB - C.P.) - Similarity(DMB - TV) ≥ 0 (segment B)	71	DMB is similar to Cellular Phone

Table 3. Compare Characteristics Between Segments

	Number of individuals	DMB awareness	Usage of cellular phone	Usage of MP3
		(know-Don't)	(less-much)	(less-much)
Segment A	169	1.242604	3.313609	2.650888
Segment B	71	1.422535	2.901408	2.169014
Canonical coefficient		0.784263	-0.34009	-0.38352
Significance value		0.007194	0.010794	0.017229

cellular phone. The results follow general belief that knowledge plays role in perception and behavior (cf. Rao and Monroe 1988; Kwanho 2008).

2. Analysis of DMB perception change after AD by Proxscal analysis

In order to investigate perceptions of DMB as well as other digital instruments, the paper applies Proxscal analysis, Multidimensional Scaling technique at SPSS statistical package. Also, another Multidimensional Scaling technique,

Correspondence analysis, is performed for comparison in next section.

As mentioned in data collection part, subjects are presented 21 pairs of 7 digital instruments and evaluate similarity judgments on 7 point scale. At the first step of analysis, for each segment, their similarity judgments are averaged and similarity matrix is made. Secondly, Proxscal analysis of segment A and B are done.

As mentioned in research design part, one get similarity judgment between DMB and other digital instruments after AD

Table 4. Research Scheme Before And After AD

Segments	number	AD manipulation	
		Cellular phone	T V
Segment A (similar to TV)	169	A - 1 (85 obs.)	A - 2 (84 obs.)
Segment B (similar to C.P.)	71	B - 1 (35 obs.)	B - 2 (36 obs.)

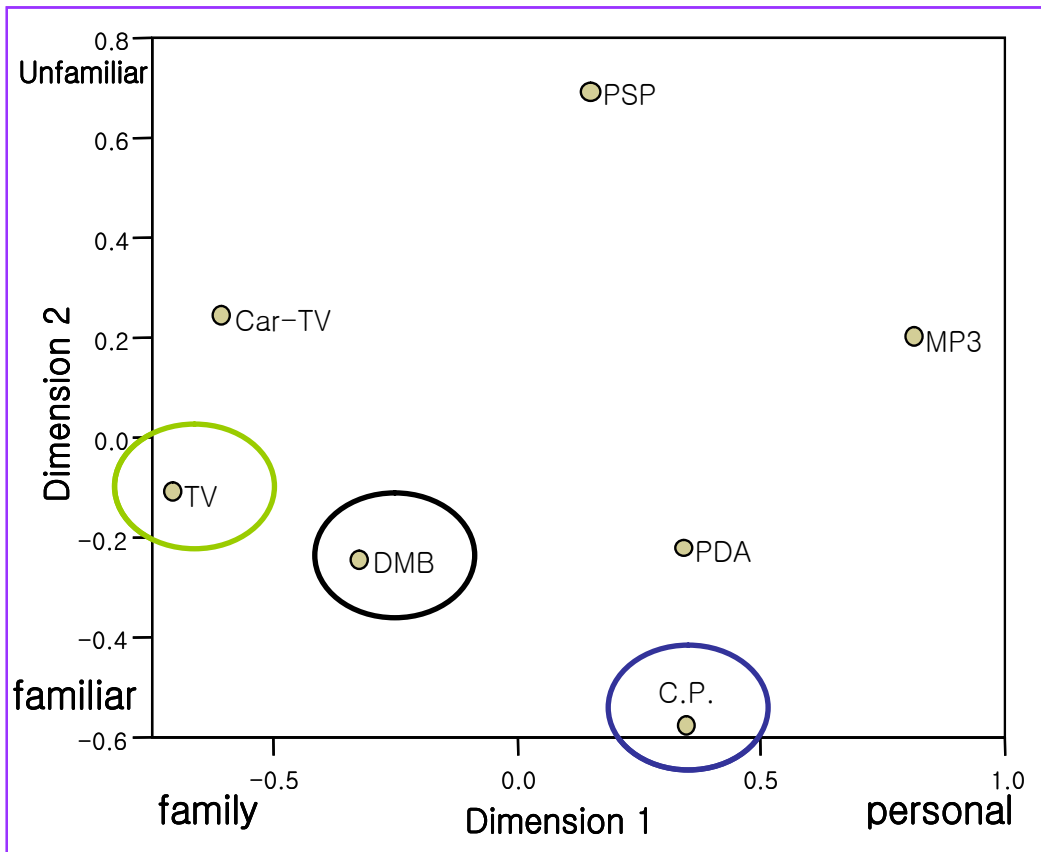


Figure 2. Proxscal Map Of Segment A - Stress= 0.024, R 2 = 0.988

exposure. Subjects who are in segment A and exposed to AD with DMB similar to TV are named A-1 group. According to segments and AD, A-2, B-1, and B-2 groups are made as shown at Table 4.

Lastly, similarity judgments on DMB from group A-1, A-2, B-1, and B-2 are named as 'after DMB' and put them into matrix made at the first stage. Then apply Proxscal analysis on these matrixes and check the positional difference of DMB

and after DMB. Figure 2 shows Proxscal map of segment A and Figure 3 shows map of segment B.

Map of segment A, who perceives DMB similar as TV, shows that DMB position closer to TV than to Cellular phone as expected. Map of segment B, who perceive DMB similar as cellular phone shows that DMB position closer to Cellular phone than to TV as expected. Stress value and R-square are both acceptable.

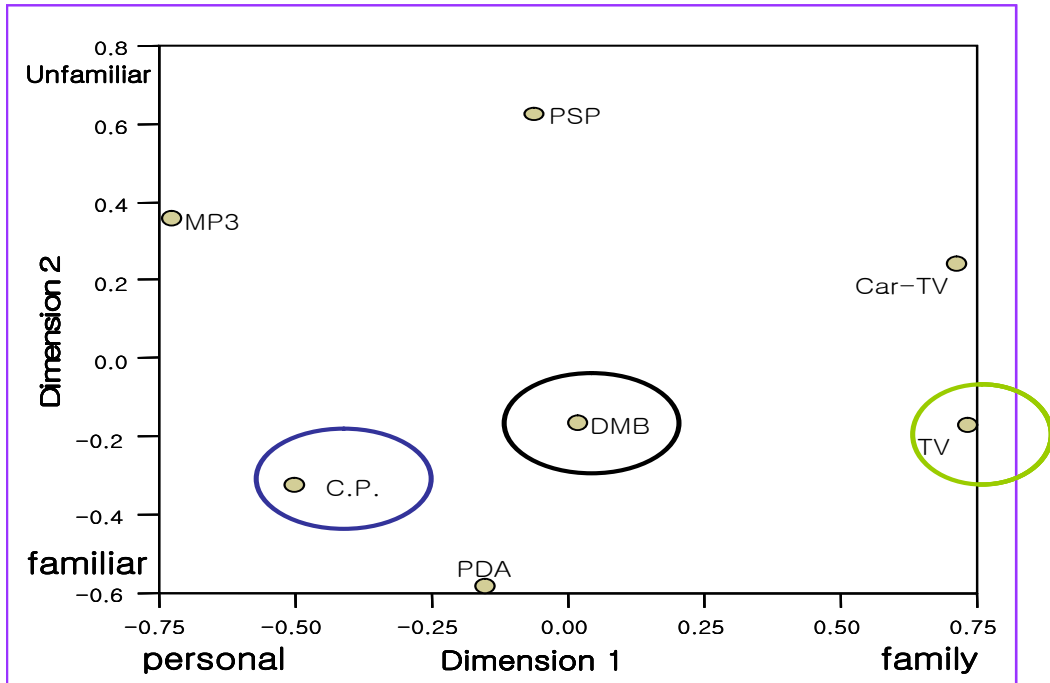


Figure 3. Proxscal Map Of Segment B - Stress= 0.028 , R 2 = 0.986

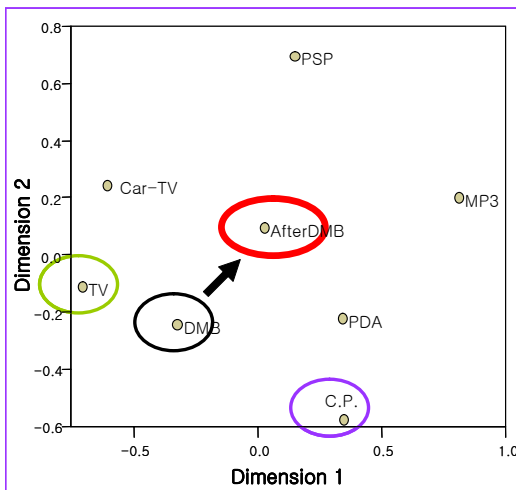


Figure 4. Map Of Group A-1

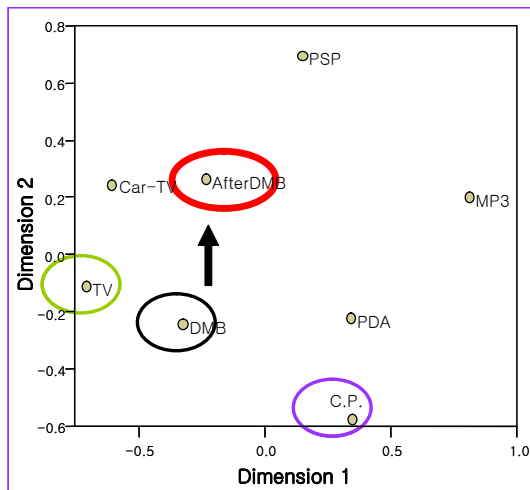


Figure 5. Map Of Group A-2

Next, Figure 4 shows how cellular phone AD changes TV-like segment

perception. So, AD makes DMB perception bent toward Cellular phone.

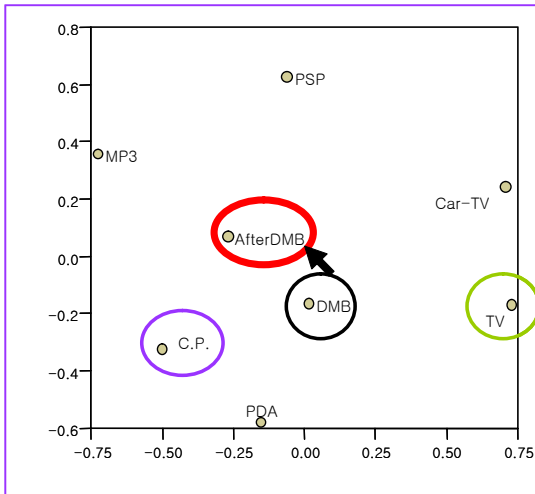


Figure 6. Map Of Group B-1

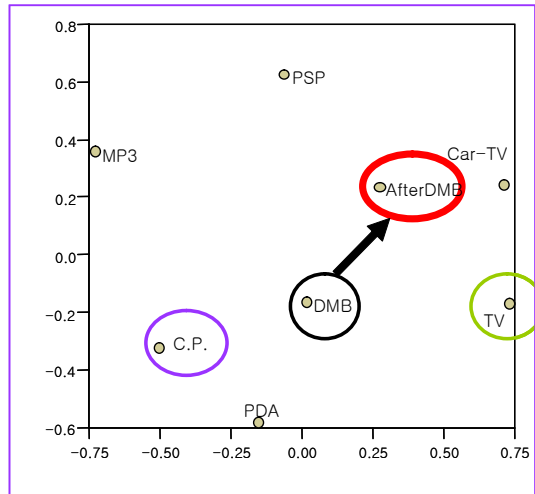


Figure 7. Map Of Group B-2

Figure 5 shows how AD toward TV changes TV-like segment perception. It shows that DMB positioning moves towards Car-TV which is more personalized one.

Figure 6 shows how AD toward cellular phone changes cellular phone-like segment position. AD clearly makes DMB move close to cellular phone. Figure 7 shows how AD toward TV changes cellular phone-like segment position. Again, AD toward TV changes DMB perception of cellular phone to Car-TV.

3. Analysis of DMB perception change after AD by Correspondence analysis

In addition to Proxscal analysis,

Correspondence analysis is applied. Correspondence analysis uses perceived characteristics data instead of similarity judgment data that is used in Proxscal analysis. AD manipulation could change perceived characteristics data more than similarity data when AD manipulation gives signal on specific attribute. However, if AD manipulation tries to directly compare DMB and other digital instrument, similarity data is changed in greater magnitude. Since AD manipulation in this paper is to stimulate non-analytical processing, Proxscal analysis may produce larger change than Correspondence analysis.

Procedure of Correspondence analysis is similar to Proxscal analysis. In data collection part, subjects are asked to evaluate 7 digital instruments along four

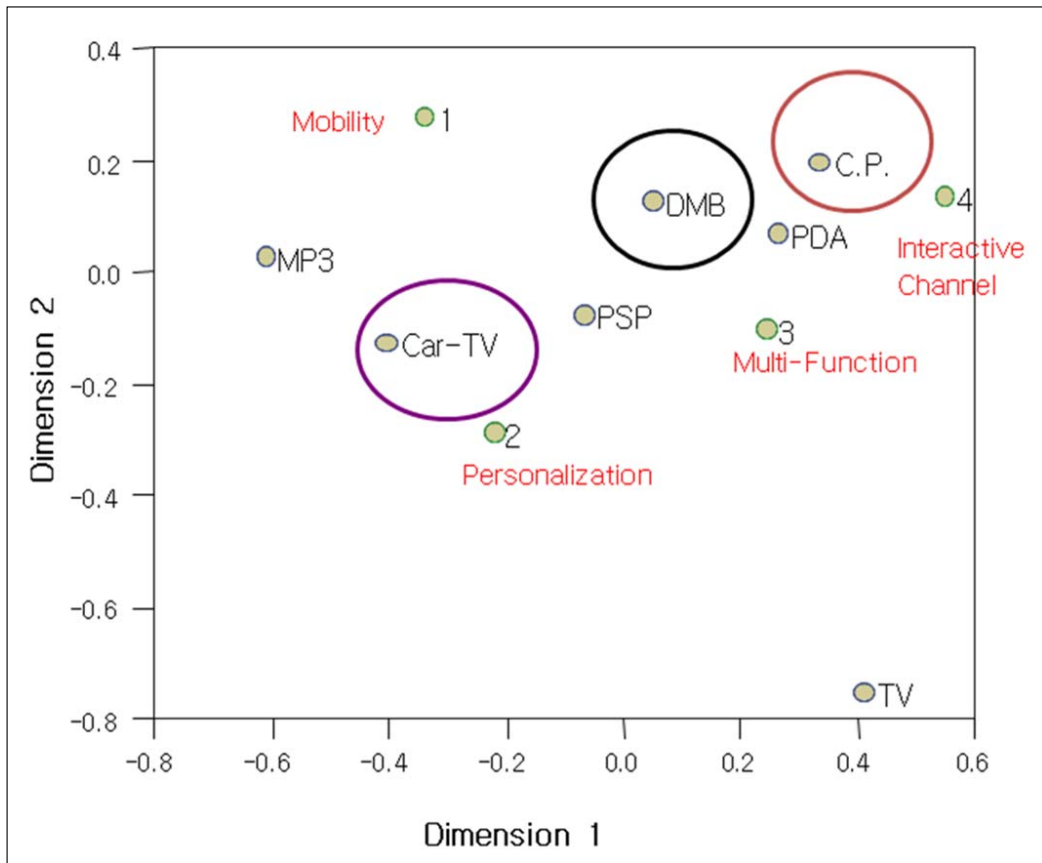


Figure 8. Correspondence Map Of Segment A

attributes, mobility, personalization, multi-function, and interactive channel about digital instruments. In the first step of analysis, their perceived characteristics are averaged for 7 instruments. At second step, Correspondence analysis from HOMALS procedure of SPSS package is applied for each segment A and B. As mentioned research design, perceived characteristics of DMB are collected one more time after AD exposure. Lastly, data collected

after AD, which is named as 'after DMB' is added into data at the first stage. Then apply Correspondence analysis on the data and check the positional difference of DMB and after DMB. Figure 8 shows Correspondence map of segment A and Figure 9 shows map of segment B.

Major difference of Correspondence Map from Proxscal Map is Car-TV replaces role of TV. In similarity judgment, TV could be considered as prototypical

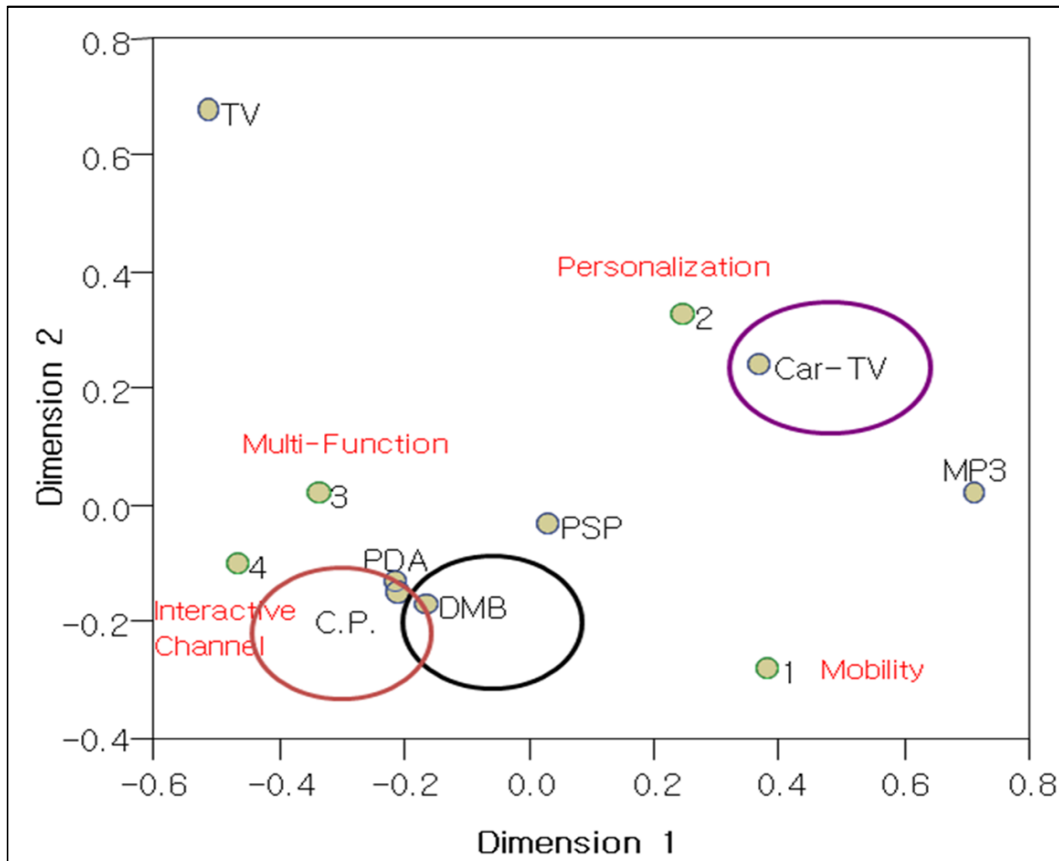


Figure 9. Correspondence Map Of Segment B

product in multimedia instruments but not in attribute rating. TV could not be close to multimedia instruments. Since correspondence analysis use attribute rating, Car-TV has more common attributes with DMB than TV, like mobility, personalization, multi-function.

Another unique characteristic of Correspondence Map is that it shows positions of attributes along with positions of instruments. As position of attribute is

close to instrument in the map, it means that the instrument has the attribute more than other instruments. In addition, Correspondence analysis has a different measure of fit other than R-square. Instead, the fit is represented by locations of attributes and instruments. Closer to the origin (0,0) better the fit. In figure 8, TV can be interpreted as not well fitted compared to other instruments. However, all figures 8 to 12 can be considered to

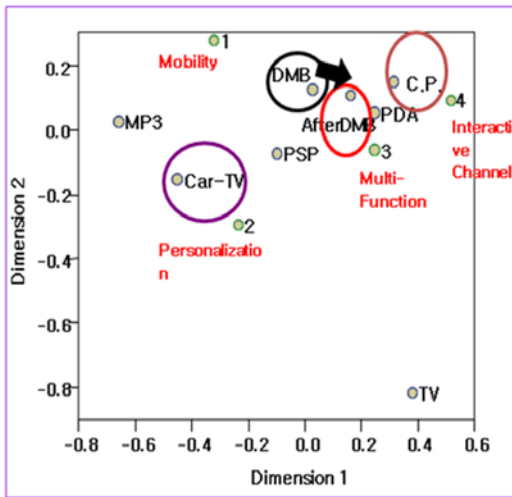


Figure 10. Map Of Group A-1

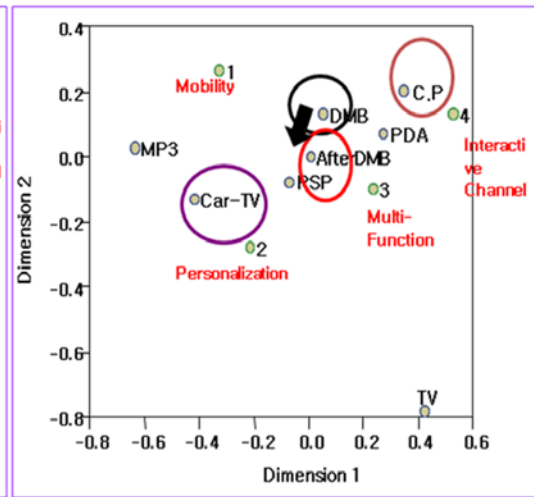


Figure 11. Map Of Group A-2

have proper fitting as a whole.

Map of segment A in Figure 8, who perceives DMB similar as TV, shows that DMB is located closer to Car-TV than to Cellular phone as expected. Map of segment B in Figure 9, who perceive DMB similar as cellular phone shows that DMB is located closer to Cellular phone than to Car-TV as expected.

Next, Figure 10 shows how AD toward cellular phone changes perception of TV-like segment. So, AD makes DMB perception bent toward Cellular phone. Figure 11 shows how AD toward TV changes perception of TV-like segment. It shows that DMB positioning moves towards Car-TV which is more personalized one.

Figure 12 shows how AD toward

cellular phone changes cellular phone-like segment position. AD clearly makes DMB move close to cellular phone. Figure 13 shows how AD toward TV changes cellular phone-like segment position. Again, TV AD changes DMB perception of cellular phone to Car-TV.

V. Discussion

This research tries to answer three research questions. The first one is to find out characteristics that explain different perception of a new product. The second one is to check whether AD is effective in changing and enforcing perception. And the third one is to check whether metric MDS can tell the change

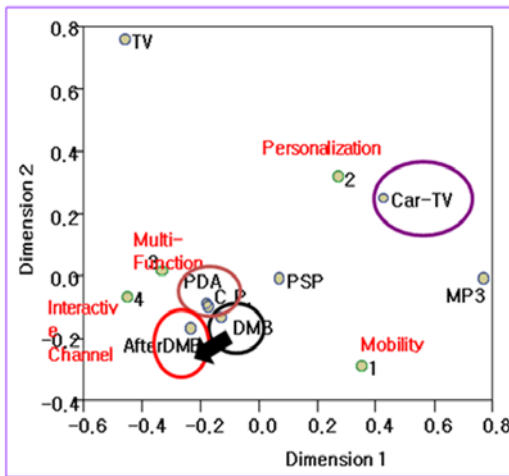


Figure 12. Map Of Group B-1

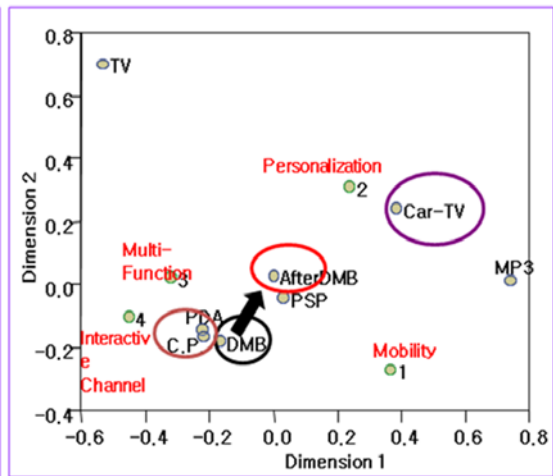


Figure 13. Map Of Group B-2

of perception about a new product that categorization is usually applied for understanding.

For empirical verification, subjects of 240 are selected from undergraduate students because they have basic knowledge about most digital equipments and have open mind about new technology. Subjects are asked to provide similarity judgment and attribute judgments about similar digital products, DMB, PDA, Car-TV, Cellular Phone, MP3 player, TV, and PSP, before and after printed advertising intentionally manipulated for certain categorization. Finally purchase intension and other questionnaire are asked.

Then, consumers are segmented according to their perception and find that variables,

prior experience, usage, and habit discriminate consumer segments. Therefore, the answer for the first research question is that perception about a new product is made mainly from prior experience.

Next, perception before AD is compared with perception after AD. Comparisons are made for each segment and for each AD. For the segment who perceives DMB similar to TV, AD that describes DMB as cellular phone, changes the prior perception. And AD that describes DMB as personal TV, re-enforces the prior perception. The same result is obtained for the segment who perceives DMB as cellular phone. So, answer for the second research question is that AD is effective in changing and enforcing perception.

This result confirms prior research that

non-analytical message is effective to change previous perception (Moreau, Markman, and Lehmann 2001; Bolton 2003; Ha and Huh 2005). The unique contribution of this paper is that it investigates the factors which affect the first impression about new product. And when it studies the change of perception from the first impression, we don't manipulate the first impression within the study.

In addition, the paper analyzes influence of perceptual change to purchase intention, which is not a research question, but is measured in data collection. As shown in Figure 14, purchase intention turns out to be high when AD enforces original perception. That is, when segment A who perceives DMB as TV, watches AD of representing DMB as TV, purchase intention is valued 5.2. In contrast, when segment B who perceives DMB as cellular watches AD of TV, purchase intention is lowest. However, this result is not statistically significant.

The answer for the third research question is that metric MDS can be used in measuring perceptual change. The paper shows how to make MDS outputs of different data comparable with each other.

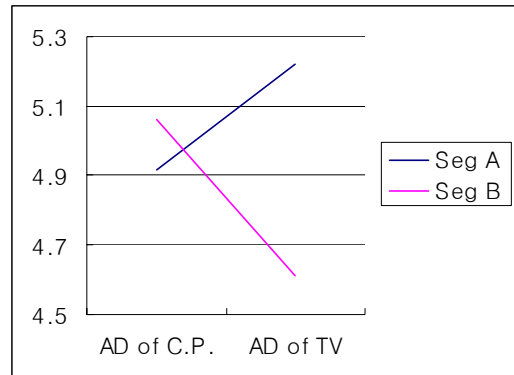


Figure 14. Purchase Intention Of AD-Segment

This paper also has limitations to be solved in near future. Methodologically, current methodology can't provide statistical test on the perceptual change, since classical MDS models, like Proxscal and correspondence analysis are not probability models. So, a new probability MDS model for testing hypothesis about configuration needs to be developed. Next, advertising message needs to be developed more rigorously from theoretical and managerial perspective. Also experimental procedure could be improved for more realistic data collection. For example, web-based experiment and real product stimuli and multimedia presentation could be employed. Or, one can display products together in simulated shop (e.g., Ebster et.al 2007). In addition, demand and social desirability threats of internal validity could influence on the results. In

order to handle the threats, results of the model-intended advertising and other “pseudo” advertising could be compared. Furthermore, one can try various level of innovativeness in order to check whether it make any different results (cf. Moon 2006). In addition, if one can create hypothetical product that is really innovative and new for research, it helps to make a vacant impression status and then to study how to form impression in more rigorous way.

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