

**The room-product-effect and its application to investigate the
desirability of designed products: a review**

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THE ROOM-PRODUCT-EFFECT AND ITS APPLICATION TO INVESTIGATE THE DESIRABILITY OF DESIGNED PRODUCTS: A REVIEW

ABSTRACT

The Room-Effect originated in environmental psychology, where the room a person was in influences how they were judged by people. Subsequent studies extended this to the Room-Product-Effect indicating its application beyond the original domain of rooms or environments to designed products. It provides a new research method for investigating the effect a product has on the person associated with it. However, no review exists summarizing the research into the Room-Product-Effect from its inception to the present. Therefore, this paper provides a systematic review that elucidates the origin, and evolution of the Room-Product-Effect, while also describing the research methods employed in its investigation. To accomplish this, six databases (Scopus, Web of Science, ScienceDirect, JStor, ProQuest, China National Knowledge Infrastructure) were used to search and locate relevant studies (the search was conducted from the time of database construction to 1 June 2023). A total of 7080 articles were retrieved. Eighteen articles that met the inclusion criteria were identified and included. This review introduces the concept, its origins, the development of the Room-Effect and the subsequent Room-Product-Effect. Additionally, ongoing research into the Room-Product-Effect are identified.

Keywords: *Environmental Psychology, Person perception, Room-Effect, Room-Product-Effect*

INTRODUCTION

Since the “Room-Effect” method was identified in 1956, further research has extended it into the Room-Product-Effect. The scope of the Room-Effect has been expanded to designed products. This theory has made contributions to both product design research and experimental aesthetics; also it provides a new research method in the broad field of design. The question the method seeks to answer is: does the room or product effect how the person associated with it is perceived. While a number of articles describe research using this method, there are no articles summarizing the research from its origin to the present. As the field has evolved, numerous findings have emerged that would benefit from an integrated review. This should identify gaps and areas warranting further investigation. This paper begins by detailing the method used in the review. It then describes the origins of the Room-Effect and its extension into the Room-Product-Effect by providing a detailed description of the studies conducted between its origin in the 1960s to the 2000s. Research on the Room-Product-Effect in the field of clothing, vehicles, and logos is reviewed and summarized. A detailed analysis and comparison of the Room-Effect and Room-Product-Effect research methods, theories, and research results are presented. The value of this review lies in bringing this phenomenon to the attention of those working in the field of social psychology. Also, and at a distinctly practical level, it provides an investigative method for those working in the design profession — architects, interior designers, and product designers.

Methods

A systematic literature review was conducted for this study. The literature search was performed in two stages. First, we searched for multiple keywords related to room effect, product effect, and person perception in six major databases (Scopus, Web of Science, ScienceDirect, JStor, ProQuest, China National Knowledge Infrastructure (CNKI)) for the terms “room effect”, “product effect”, “product and person perception” and room AND effect OR product AND effect OR environment AND

psychology OR influence OR perception OR influence OR product AND design respectively, influence OR product AND design were searched, dress AND students AND perception. When a large number of articles were found for the keyword “product effect”, the system was limited to the disciplines of Social Sciences, Psychology, Environmental Science, Arts and Humanities. The search was conducted from the time of database construction to 1 June 2023. A total of 7080 results were found from these databases. These search results were filtered by reading the titles and abstracts. At the title and abstract reading stage, exclusion criteria were used to select eligible studies. First, if the title or abstract did not indicate that they were about the perception of a person, then that article was not considered relevant to this study. The inclusion criterion was a word in the title or abstract that was similar to perception, e.g. judgment, perceived, or response, the article was likely to be relevant, and then it moved on to the next stage for full-text review. Secondly, for articles related to room or product perception of people, it should be the effect of the room or product on how the person is perceived or to whom it relates. Such studies were included in this review. Articles that were not relevant to the effects of rooms or products on the perceptions of the people with whom they are associated were excluded. This is important to note because most of the articles were about the impact of the room or product on the users themselves, and not the impact of people's perceptions of the person associated with them. Typical studies and cases were included in this systematic review to give a comprehensive overview. During the full-text review stage, the researchers reviewed a total of 37 articles, and 18 studies were ultimately included in this review.

The origin of the Room-Effect

The Room-Effect method derived from the field of Environmental Psychology. This method shows that people’s judgment of a person can be influenced by the environment that person is in. Maslow and Mintz published the first version of the Room-Effect method in 1956. They observed that the characteristics of a room had an impact on the evaluation of people’s facial impressions linked to that

environment. They conducted a field experiment. In three different environments rooms (“beautiful”, “average”, and “ugly”), 42 undergraduate students (26 male, 16 female) rated the “fatigue/energy” and “displeasure/well-being” of 10 negative face photographs without knowing the purpose of the experiment (Maslow & Mintz, 1956). Rating scales were used to test the judgments of the undergraduates on 10 negative face photographs in different environmental condition rooms. Of the negative-print photographs that were rated by all students. 16 students were tested in the “beautiful” room, 10 in the “average” room, and 16 in the “ugly” room. Each photograph was judged on two dimensions, “energy” and “well-being”, and the scale had 10 questions for each dimension, with each question having a weight of from 1 to 6. See Table 1 for details of the method. The findings indicate that students’ evaluations of the faces in the photographs vary across different environmental rooms. Students in the “beautiful” room rated the people in the photos significantly higher (more “energy” and “well-being”) than students tested in the “average” or “ugly” rooms. The students tested in the “average” room gave slightly higher ratings of the people in photographs compared to the students tested in the “ugly” room. The mean score for ratings of the people in photographs tested in the “beautiful” room were within the “energy” and “well-being” range, while the mean scores of the people in photographs in the both “average” room and “ugly” room fell within the “fatigued” and “displeased” range. The results indicated that students’ perceptions of faces varied depending on the test situation.

Table 1 Analysis of specific research methods in the Maslow and Mintz study

Researchers	Maslow and Mintz
Study time	1956
Study files	Rooms
Study method	In three different visual-esthetic condition rooms, two dimension rating scales (“energy” and “well-being”)
The survey formats	Paper
Variables in the study	The “beautiful” room, the “average” room, the “ugly” room
Photograph-people models	Male, female

Table 1 (continued)

Photograph – model countries	Caucasian
Participants	Undergraduate students
Participants number	42
Participant's gender	Male 26, female 16
Main participants countries	USA
Participants language	Non-Chinese
Study tools	A six-point, two dimension rating scales
Data analysis	Analysis of variance (ANOVA)
The results	Existence of the Room-Effects

Research by Canter, West and Wools in 1974 found that the characteristics of a room were transferred to its occupant (Canter et al., 1974). They employed a similar method in their research to Maslow and Mintz. However, instead of using the real room environment as a variable, they conducted three experiments, showing participants a line drawing of rooms, the color slides of the real rooms, and a photo of the rooms in a different environment as a background. They were also asked to indicate their reactions to the rooms and their perceptions of the people in the rooms. The specific research methods for the three experiments are detailed in Table 2.

Table 2 Analysis of the specific research methods of the three experiments in the Canter, West, and Wools study

	Experiment 1	Experiment 2	Experiment 3
Research question	To test people's ratings of rooms	To test the findings of experiment 1	To test the effects of the room background on judgments of people in photographs
The survey formats	Paper (show the line-drawings of rooms containing outlined seated figures)	Paper (show realistic architectural stimuli color slides of real rooms)	Paper (show black and white slides)

Table 2 (continued)

	Experiment 1	Experiment 2	Experiment 3
Variables in the study	The 15 line drawing of rooms	24 color-slides of unfamiliar rooms	Room A: a Victorian window overlooking an industrial scene; Room B: the library of the Q.E.2 Room C: a large IBM office
Photograph-people models	Person	No people models	3 pieces of male people models head-and-shoulder photographs
The stimuli	15 monochromatic line-drawings of rooms	24 color-slides of unfamiliar rooms	Three different rooms (room A, room B, room C) match three different men photos
Participants	One set: 67 including many disciplines students, excluding architecture or design students The second set: 24 non-architecture students	Architecture students and psychology students	Architecture students
Participants number	91 (one set – 67, the second set – 24)	73 (Architecture – 41, psychology – 32)	30
Participants language	Non-Chinese	Non-Chinese	Non-Chinese
Study tools	Osgood's dimensions, Guttman scale	The five bipolar adjectival scales (Guttman scales)	Three five-item evaluation, Potency and activity scales
Data analysis	Means calculated from the scores for each drawing on the seven dimensions for all subjects in each group	T-tests, F-tests, or the normally distributed difference between standardized correlation coefficients	T-test, ANOVA
The results	A similarity relation between ratings of rooms and people associated with them	Significant correlation between ratings of evaluation of the users and the friendliness of the rooms	Existence of the Room-Effects

The three experiments taken together clearly show a strong association between the judgments of the room and the judgments of the people in the room. There was a positive association between judgments of people and the rooms they were in. It indicates that the evaluations significantly varied depending on the background against which the people were perceived (Canter, 1977) (Fig. 1). It does appear that there is a “room effect,” whereby judgments about people are altered by the room in which they are placed.



Fig. 1 *The Room-Effect method. Source: Adapted from “Psychology of Place” by Canter, 1977, The Architectural Press, London. Reprinted with permission.*

Following the work of Maslow and Mintz, several studies were carried out in the 1960s and 1980s that examined the effect that the environmental setting had on the perception of a person associated with that environment. Many studies (Rosenthal, 1969; Zweigenhaft, 1976; Campbell, 1979) were concerned with the judgment made by students based on their professors’ offices. For example, Campbell (1979) focused on students’ perceptions of professors in different environmental offices. A simulation study explored the impact on students of several environmental variables in faculty offices. The results showed students developed more positive perceptions of their professors when the offices where they were located had plants and posters; cluttered offices led to strong negative perceptions of professors, and the arrangement of office furniture had less of an effect on students’ evaluations of professors. The pattern of interactions suggests that the salience of environmental factors moderated their impact. The environmental factors had a greater impact on the women they were associated with

than on the men they were associated with.

In the 1980s and 2000s, surveys of the literature show many researchers focused on the effect that tested participants' judgment on the residential house and offices (for example, Cherulnik & Souders, 1984; Sadalla et al., 1987; Nasar, 1989; Wilson & Mackenzie, 2000; Larsson, Vinberg & Jahncke, 2022). The study by Cherulnik and Souders (1984) investigated the extent to which settings convey social attributes. Participants made judgments about the occupants of different classes of communities or different types of work environments, as well as judgments about the settings. The result showed that residents in higher-status neighborhoods also had higher occupational status and more positive personality traits. Those who worked in settings with higher occupational type status were judged to have more positive personality traits. Participants rated communities with a higher social class more favorably (Cherulnik & Souders, 1984). Participants derived information about the social and personal dimensions of the residents based on the room's design, including age, occupation, wealth, personality, aspirations, hobbies, and lifestyles (Wilson & Mackenzie, 2000). The design of office physical environments, especially those of different office types (cell offices, open-plan offices, and activity-based flexible offices), influenced employees' perceptions of leadership behaviors in large Swedish governmental organizations (Larsson, Vinberg & Jahncke, 2022). The results of a naturalistic intervention control study by Larsson et al. showed that employee perceptions of leadership behaviors were rated lower in activity-based flexible offices relative to cell offices and open-plan offices. The above studies focused on the influence of environments on people's perception and did not extend this to products or objects.

Extending the Room-Effect into the Room-Product-Effect

Previous research has focused on the influence of residential houses or working offices on people's perceptions. Subsequent studies have extended the Room-Effect to what can be termed the Room-Product-Effect. The Room-Product-Effect indicated the Room-Effect applies beyond the domain of

rooms or environments to designed products. Several studies (Rollman, 1980; Chowdhary, 1988; Butler et al., 1989; Phillips & Smith, 1992; Morris, Gorham, Cohen & Huffman, 1996; Carr et al., 2010; Sebastian & Bristow, 2008; Lightstone et al., 2011; Kazuko, 2013; Shepherd et al., 2022) have found that teacher dress style affects students' perception of the teacher. The findings from Rollman's (1980) study revealed that the dress styles of male and female teachers significantly influenced students' judgments of them. In addition, students gave more positive ratings to teachers who wore a particular style of dress. Students perceive male and female teachers who dress informally as more friendly and flexible, and those who dress formally as the most organized (Rollman, 1980). Chowdhary's results indicated that the same teacher while in Western clothing was perceived by students more positively in their overall rating of her than when she was dressed in Indian clothing (Usha Chowdhary, 1988). The findings from Butler and Roesel's study indicated that the female teacher informally dressed was perceived as more approachable, less knowledgeable, and more acceptable (Butler and Roesel, 1989). Phillips and Smith's findings indicated that students perceived casual clothing as conveying teacher friendliness, fairness, and interestingness. Informally dressed teachers were perceived to be more friendly, organized, fun, understanding, and disciplined. Teachers who dressed conservatively were perceived to be more organized, knowledgeable, and disciplined (Phillips and Smith, 1992). Morris et al. investigated the impact of the teacher's clothing on students' perceptions of college teachers in a live lecture context. The study showed that the more formal the teacher's dress (e.g., business suit, formal shoes), the higher the students' ratings of their competence, especially female college students' ratings of female teachers (Morris et al., 1996). Sebastian and Bristow' findings indicated that professors' style of dress largely influenced how business students perceived them, with professors who dressed formally being perceived as more professional than those who dressed casually. Professors who dress casually were perceived as more approachable than those who dress formally (Sebastian and Bristow, 2008). The research of Lightstone, Francis, and Kocumindicates found that university professors dressed formally were perceived as more credible

than their less formally dressed faculty. Furthermore, males in formal attire were less likeable than females in formal dress as well as males and females in casual styles of dress (Lightstone et al., 2011). Tamura and Hirabayashi found that teachers dressed in business suits were preferred by students, while a white coat and jersey tracksuit were perceived as neutral. Teachers dressed in factory-style work clothes were perceived to be the least preferable, particularly for female teachers (Tamura and Hirabayashi, 2013). Shepherd and Yeon observed that students prefer female and male teachers to wear business casual clothing while teaching. Teachers dressed in business casual attire are most conducive to students' perception of the teacher's competence and approachability, as well as to student learning (Shepherd and Yeon, 2022). Table 3 presents a comparative analysis of the specific research methods (stimuli, participants, etc.), and research findings used by relevant researchers on the effects of clothing on teacher perception. The collective findings from these studies indicate that teacher dress style significantly influences student perceptions in various ways. Whether it's the formality of attire, or specific clothing choices, they all play a role in shaping students' views of their teachers.

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Table 3 *The specific research methods used by these researchers*

Authors	Stimuli – model	Stimuli – clothing style	Stimuli form	Participants’ education	Participants number	Participants Region	Research approach	Questionnaire	Data analysis	The results
Rollman (1980)	Headless stimuli, 3 female, 3 male	Formal, Moderate, Informal attire	Photo	University undergraduate students	100 Male – 50 Female – 50	Not mention in the text	Quantitative studies, Survey	Five-point scales	T-test	Students’ perceptions of teacher characteristics are influenced by teachers’ dress styles.
Chowdhar (1988)	Indian female	Indian, Western clothing	Real people	Undergraduate female students	31 Male – 15 female – 16	USA	Quantitative studies, Survey, Natural environment experiment	Teacher evaluation instrument 4 level	T-test, Paired T-test	Dress has an impact on students’ evaluations of their instructor.
Butler and Roesel (1989)	Headless stimuli, Female	2 – two leisure 2 – suited clothing	Color photo	High school students	201 Male – 44 Female – 157	USA	Quantitative studies, Survey	Item form	Chi square techniques	Students’ perceptions of female teacher characteristics are influenced by teachers’ dress styles.
Phillips and Smith (1992)	1 female	Casual, Moderate, Conservative clothing	Photo	Elementary school, Middle school, High school	60 Male – 27 Female – 33	USA	Quantitative studies, Survey (One participant saw one model with 3 photos)	Modified Likert scale	ANOVA	Female teachers’ style of dress has a significant impact on students’ perceptions.
Morris et al. (1996)	2 female, 2 male	Formal professional, Casual professional, Casual clothing	Real people (on the course)	University undergraduate students	401 Male – 186 Female – 215	USA	Quantitative studies, Survey (Natural Experiment)	Instructor evaluation forms, Five-point scales	ANOVA, LSD post-hoc tests, The η^2 statistic	Teachers’ clothing has an impact on students’ perceptions of university teachers.

Table 3 (continued)

Authors	Stimuli – model	Stimuli – clothing style	Stimuli form	Participants’ education	Participants number	Participants Region	Research approach	Questionnaire	Data analysis	The results
Sebastian and Bristow (2008)	1 female, 1 male	Casual or denim shirt and khaki pants, formal or business suit Form of address or title (informal or first name or formal or last name)	Color photo (in the room)	University business students	257 Male – 132 Female – 125	USA	Quantitative studies, Survey	15-item scale and the 4-item scale of actor’ like ability	ANOVA, Interaction analyses, Significance tests	Professors’ style of dress influenced how business students perceived them.
Lightstone et al. (2011)	Headless stimuli, Female	Casual, Semi-casual, Formal clothing	Photo (on line)	University undergraduate students	257 Female and male	Canadian	Quantitative studies, Survey	Five-point scales	Descriptive statistics, Z-score residuals, One-way ANOVA	Professors’ style of dress affects students’ perceptions of teachers’ characteristics.
Tamura and Hirabayashi (2013)	Female, Male	Female – skirt, underwear, overalls, white dress, sweatshirt and suit, white, sweatshirt and suit Male – work wear, white, sweatshirt and suit pose	Photo (on the course)	High school students	46 Female – 46	Japan	Quantitative studies, Survey	3 level Five-point scales	T-test / Pearson’s product rate correlation coefficient, Regression analysis/ Multiple regression analysis	Teachers’ clothing styles influence Japanese high school girls’ perceptions of teachers’ characteristics.
Shepherd and Yeon (2022)	Headless stimuli, Female, Male	Very informal clothing, casual clothing Business casual clothing, more formal clothing	Photo (on line)	University undergraduate students	92 Female and male	USA	Quantitative studies and Qualitative research, Survey	Likert scale, Written comments	Overall averages	Teachers’ clothing styles influence students’ perceptions of teachers’ characteristics.

In addition to the fact that different styles of clothing affect people's perceptions of the people with whom they are associated, the McKeachie's study indicates that people's first impression of a woman's personality is influenced by whether she wears lipstick or not, and there is a stereotype of women who wear lipstick (McKeachie, 1952). The Thornton study indicates that wearing glasses influenced people's judgment of the person, often causing the person wearing glasses to be perceived as more intelligent, hardworking, and reliable (Thornton, 1944). Vehicles and signs also affect how people perceive the people they are associated with (Effendi and Whitfield, 2012; Idris and Whitfield, 2014; Hashim and Whitfield, 2015).

Effendi and Whitfield's (2011, 2012) research indicates that the car associated with a person affected how the person was judged. The study visually depicted male/female, Asian/Caucasian owners alongside either a Mercedes Benz or a Proton car. Effendi and Whitfield (2012) used an internet survey on the website of Swinburne University of Technology. The questionnaire was placed on a web page of tutorials for learning graphics software (Adobe Flash, Adobe Photo shop et al.). Respondents were recruited in such a way that if visitors to the website completed the survey, they would receive the opportunity to learn the graphic software tutorial for free. At the same time, participants were allowed to win material prizes. A total of 1053 males and females from many countries participated in the survey. These were mainly from Australia (17%), India (15%), the USA (15%), and the United Kingdom (7%), all drawn from an international pool of English speakers.

The variables of the stimuli in this study were two different brands of vehicles (the Mercedes-Benz C-Class, and the Proton Persona). Both brands of cars were presented next to four digitally-enhanced owners to achieve similar orientation, age, and looks. For example, the Mercedes-Benz C-Class and the Proton Persona were pictured alongside the two male female Caucasian/Asian models. See (Fig. 2) for details.

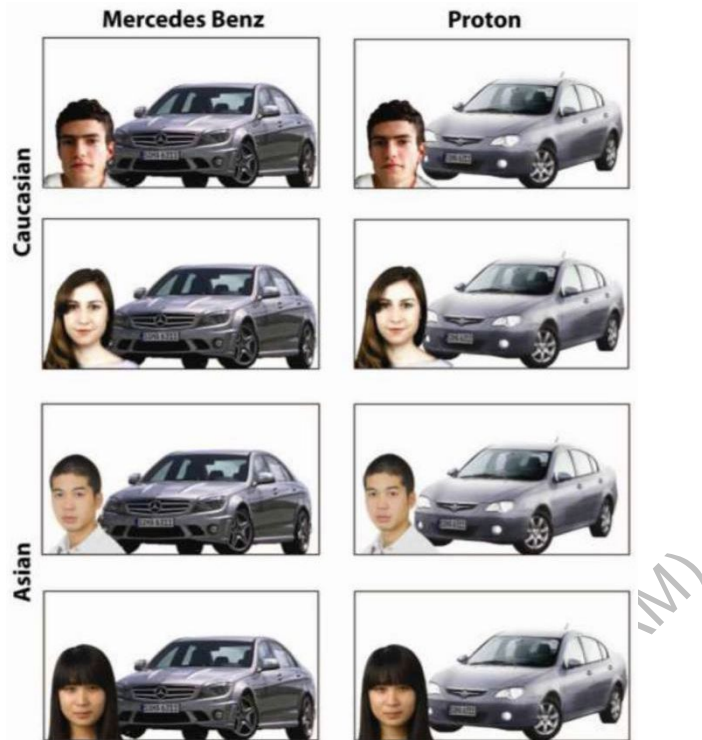


Fig. 2 Digitally-rendered stimuli. Adapted from “He looks six years younger in that Porsche: Do the qualities of products transfer to their owners?” by Effendi and Whitfield, 2012, *Asian Social Science*, 8(15), 250-260. Reprinted with permission.

Figure 2 shows the stimuli used in the Product-Effect study by Effendi (2012). The eight pictures contained head-and-shoulder digitally modified owners superimposed beside two different cars. The owner is located in the same position on the car in all eight pictures, and the car has been modified to be as similar as possible in size, orientation, and color. Respondents only saw one image and were asked to judge the person. A nine-point Likert scale was used to survey participants. The questionnaire composed three dimensions: physical, social and personality characteristics. The Five-Factor Model (FFM) was used as the main source of the questions on personality characteristics. The FFM, also known as the Big Five personality traits, is an important theoretical model of personality. This model describes a person’s personality through five relatively independent factors through which a person’s future workplace performance can be broadly reflected. In addition to using the FFM as a tool in understanding the relationship between personality and different behaviors (Reilly, Lynn & Aronson,

2002), it has also been used in product design to understand the relationship between visual aesthetic features and product personality perceptions (Brunel & Kumar, 2007). Govers and Mugge (2004) used the FFM to study the effect of congruence between a person's personality and the personality of their product (i.e., product-personality congruence) on product attachment. The FFM of personality has been used to study product personality, brand personality, and user perception. The questionnaire consisted of 23 questions.

One thousand and fifty-three participants (78% male and 22% female) responded to the questionnaire via the Internet. It is important to note that there were eight stimulus images in the study, which were presented to different respondents in eight separate sets. Only one questionnaire was available to each participant. One questionnaire consisted of a stimulus image and 23 questions. Participants responded to the questions according to the stimulus image in the questionnaire. This ensured that participants were unaware that the focus of the study was the effect of the car on perception of its owner.

The data obtained were analyzed by Factor Analysis using Principal Axis Factoring with Direct Oblimin rotation to determine the underlying relationships between the scales. The two identified factors were then subjected to ANOVA. The results demonstrated a Product-Effect. This was most pronounced for the Caucasian male, with lesser effects for the Asian and Caucasian females, and none for the Asian male (Effendi and Whitfield, 2012). The quality of the car is transferred to the owner and influences the physical (height, weight) and socio-economic (education, income) of the owner. The transfer of car quality did not extend to personality characteristics, i.e. different car types did not affect people's perceptions of the personality characteristics of the car owners, thus pointing to avenues for further research, particularly regarding the effects of gender, nationality/culture, and product type on the effects elicited. Tentative hypotheses were advanced to account for this.

Idris and Whitfield (2014) investigated the effects of Corporate Visual Identity (CVI) on personal perception by using the Room-Effect method. The results indicated that the logo and name of the

university influenced respondents' perceptions of the university lecturers associated with it. The study presented participants with different logos and names of the university, accompanied by lecturers. The intentions were to see if these stimuli change the way respondents judged the lecturers. Idris and Whitfield (2011, 2014) using the same method as Effendi and Whitfield above, participants were obtained from users of the website of Swinburne University of Technology. The questionnaire was placed on a web page for learning graphics software tutorials (Adobe flash, Adobe Photoshop et al.). Participants were recruited in such a way that visitors to the website who completed the questionnaire were offered the opportunity to learn the tutorials for free. A total of 888 male and female from a variety of countries took part. The participants mainly came from Australia (17.2%), India (15.1%), the USA (15.1%) and the United Kingdom (6.9%), all drawn from an international pool of English speakers.

The stimuli in this study were two different styles of university logos (a traditional logo and a modern logo) and two different university names (an actual name, and a fictional name), and the associated male and female faculty models as the stimulus images. The four different types of university logo and university name combinations are the traditional university logo with the actual university name, the traditional university logo with the fictional university name, the modern university logo with the actual university name, and the modern university logo with the fictional university name. The two lecturer models were both Asian, one male and one female. The images of the four different types of university logos and name combinations combined with the lecturer models of one gender form four stimulus images. The two lecturer models and the four different types of university logos and university name combinations form a total of eight stimulus images. See (Fig. 3) for details.

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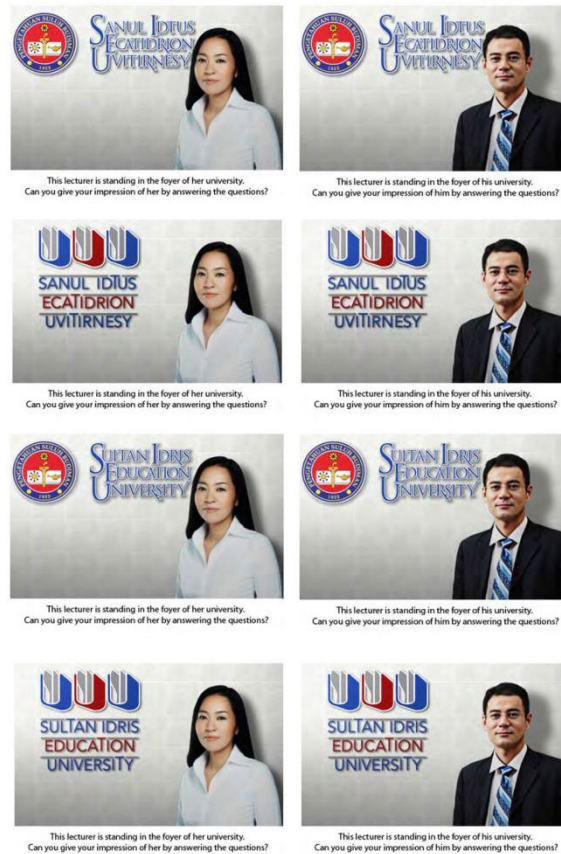


Fig. 3 Eight digitally processed stimulus images used in the study. Source: Adapted from “Swayed by the logo and name: Does university branding work?” by Idris and Whitfield, 2014, *Journal of Marketing for Higher Education*, 24(1), 41-58. Reprinted with permission.

Likert scales were used to test the participants in this study. The questionnaire consisted of four themes: research quality, teaching quality, graduate employment, and international outlook. The questions were designed based on the content of the Times Higher Education (THE) World University Rankings. There were 16 questions, and 888 participants (68.5% male and 31% female) completed responses to the questionnaire via the Internet. The eight sets of questionnaires were randomized and each participant was given only one set containing one stimulus image and 16 questions each. Participants responded to the questions based on the stimulus pictures in the questionnaire. The data generated new subjected to Factor Analysis to identify commonalities among the questions. The resulting factors, were then subjected to ANOVA. The results of the study showed that the university

CVI highly influenced participants' perceptions of the male lecturer, but not the female lecturer. The university's traditional CVI conferred upon the male lecturer a higher academic status (perceived to be higher in terms of intelligence and credibility). The Male lecturer was perceived to be more trustworthy when associated with the university's actual name (Idris and Whitfield, 2011, 2014). Again, as with Effendi and Whitfield (2011, 2012) above, hypotheses were advanced to account for this.

Hashim and Whitfield's (2012, 2015) research also indicates the same effect for the motorcycle. Association with a person affected how the person was judged. Using international participants on the Internet, the research indicates that the presence of a motorcycle affected how people were perceived and that a Product-Effect existed in a similar way as the Room-Effect. Hashim (2015) used an internet survey on the Swinburne University of Technology website. The questionnaire was hosted on a web page of Swinburne University of Technology dedicated to tutorials on graphic design software, including Adobe Flash and Adobe Photoshop. Participants were recruited in a manner such that, upon completing the survey, they were granted complimentary access to the graphic software tutorials. Additionally, participants had the opportunity to be eligible for prizes as incentives for their involvement. A total of 1078 males and females from 108 countries, mainly Australia, India, and the USA participated in the survey. All participants were from an international pool of English speakers. The variables were two different styles of motorbike (a Yamaha and a Modenas). The three independent variables were the motorcycle, the model's gender, and the model's nationality. Both motorcycles were presented next to four models; two male models (one Caucasian, and one Asian) and two female models (one Caucasian, and one Asian). The stimuli images were digitized color images.

Eight different combinations of visual stimuli were presented to respondents. Both a Yamaha and a Modenas motorcycle were put in the background with photographic images of people, both male and female models of Asian and Caucasian. In each combination, the composition of the photograph was identical, with the motorcycles digitally modified to be as similar as possible in terms of size,

orientation, and color. The study tested participants using Likert scales, which consisted of three sections of 18 questions. Eleven of the questions covered the FFM of Personality traits, five were about the demographic characteristics of the people models (height, weight, age) and two were about the demographic characteristics of the participants. Eight stimulus images were presented to different participants in eight sets of questionnaires. Only one questionnaire was available to each participant. One questionnaire consisted of a stimulus image and 18 questions. The data generated were subjected to Factor Analysis and the identified factors were then subjected to ANOVA. The results of the survey further confirmed that the Room-Effect method can be applied to products. The two makes of motorcycles influenced participants' judgment of their owners, with strong gender and some nationality effects. The motorcycle effect was more pronounced for female models, with the motorcycles having little effect on the perception of the male models. Female models were rated higher when they appeared with the Yamaha than when they appeared with the Modenas. Table 4 provides a comparative analysis of the specific research methods used in studying the Product-Effect within the domains of vehicle and logo-name.

Table 4 *The specific study methods (stimuli, participants, etc.) and analysis of the results of the Product Effects*

Researchers	Effendi and Whitfield	Idris and Whitfield	Hashim and Whitfield
Study time	2011, 2012	2011, 2014	2012, 2015
Study areas	Cars	University CVI	Motorcycles
Study method	The Room-Effect, the Five-Factor Model	The Room-Effect, the Times Higher Education (THE) World University Rankings	The Room-Effect, the Five-Factor Model
The survey formats	Online	Online	Online

Table 4 (continued)

Researchers	Effendi and Whitfield	Idris and Whitfield	Hashim and Whitfield
Stimuli – products	The Mercedes-Benz C-Class car, the Proton Persona car	The traditional university logo, the modern university logo, the actual university name, the fictional university name	The Yamaha motorcycle, the Modenas scooter
Stimuli – people models	Male, female	Male, female	Male, female
Stimuli – people models' countries	Asian, Caucasian	Asian	Asian, Caucasian
Participants number	1053	888	1078
Participant's gender	Male, female	Male, female	Male, female
Main participants' countries	Australia, India, USA	Australia, India, USA	Australia, India, USA
Participant's language	Non-Chinese	Non-Chinese	Non-Chinese
Study tools	Nine-point Likert	Nine-point Likert	Nine-point Likert
Data analysis	Factor Analysis, ANOVA	Factor Analysis, ANOVA	Factor Analysis, ANOVA
The results	Existence of product effects	Existence of product effects	Existence of product effects

What appears to be occurring is that the qualities of the object (room, vehicle, logo-name, clothing, glasses, lipsticks) were transferred to the person associated with them. These studies showed the existence of the Room-Product-Effect in these product areas. Studies have been expanded from the effect of the room on people's perceptions, the effect of the home or work office on people's perceptions, to the effect of the product on people's perceptions. See (Fig. 4) for details.

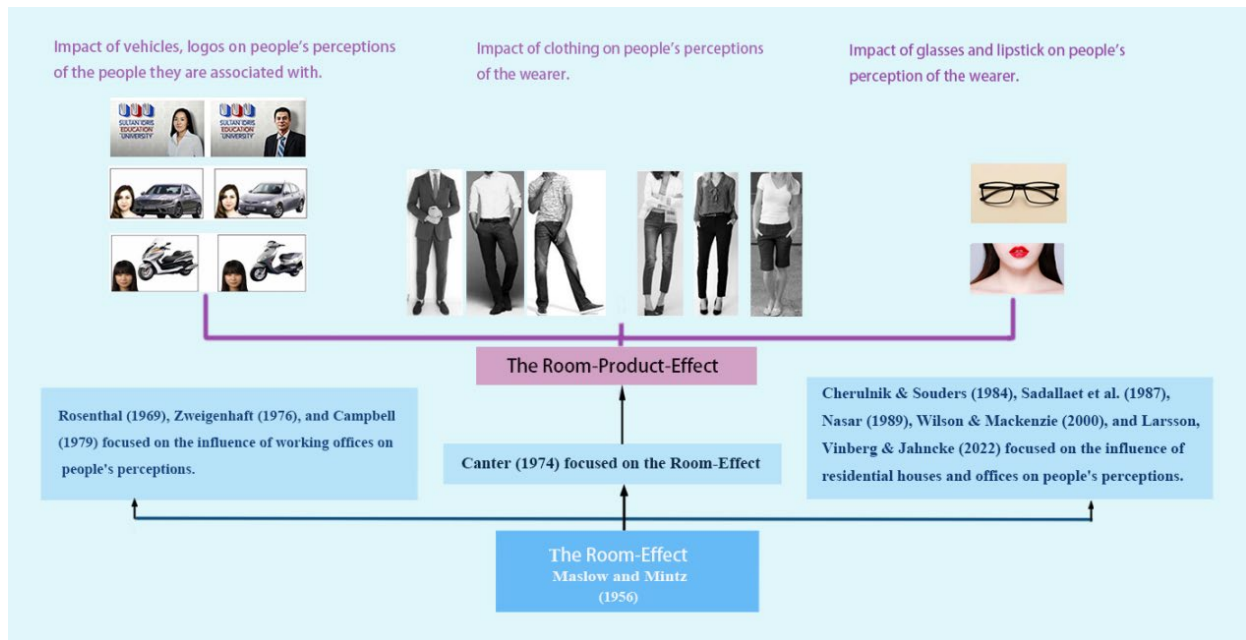


Fig. 4 An overview of the research from the Room-Effect to the Room-Product-Effect. Source: The little picture in the middle adapted from “Student Preferences about University Education Department Instructor Attire” by Shepherd and Yeon, 2022, *Knowledge*, 2(2), 191-208. Reprinted with permission.

CONCLUSION

These studies demonstrate the Room-Product-Effect, and contribute to the field of social psychology. At a more practical level they offer a method for investigating the possible effect a product may have on perception of the person associated with it. This would be useful in the fields of design and marketing. The research raises the question of whether this effect can extend to other products and fields. Current research now being undertaken is investigating its extension to jewelry, Chinese women’s clothing, and packaging. In addition, from initial studies of the Room-Effect to the Product-Effect, these studies have been conducted with mainly English speaking participants. The Chinese language is currently spoken by around one and a half billion people worldwide (National Bureau of Statistics of China, 2021), approximately twenty per cent of the world’s population, and is one of the official languages of the United Nations (Ziemski, Junczys-Dowmunt, & Pouliquen, 2016). To further

explore the Room-Product-Effect, ongoing studies are extending the research to Chinese language participants.

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Data Availability (Data Transparency) We do not generate any datasets but analyze the datasets from the related references in the review article. Datasets are available through the corresponding author upon reasonable request.

Code Availability (Software Application or Custom Code) not applicable.

Declarations

Conflicts of interest The authors have no potential conflicts of interest to declare that are relevant to the content of this article.

Ethics approval The study presented a systematic review of current research as primary sources and therefore did not require ethics approval.

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