

1: Individual differences in mental imagery experience: developmental changes and specialization.

In Studies imagery differences in specialist groups were examined using the same two questionnaires with a total of participants. In Study 2, children aged years with poor movement control were found to be extremely poor imagers with 42 per cent reporting no imagery at all.

Scales in three domains are reviewed: Awareness of the content and psychometric properties of these scales is important for future research on imagery. In a consumer context, the use of imagery in processing both visual and verbal information can enhance memory for product related information Rossiter ; Childers and Houston , ; Kisielius ; Lutz and Lutz Rossiter and Percy Imagery may also serve as a form of cognitive elaboration Greenwald and Leavitt , and play an important role in forming product attitudes Rossiter and Percy ; Percy and Rossiter ; Kisielius and Sternthal , Hypotheses concerning the role of imagery in forming purchase related expectations and its subsequent impact on post-purchase satisfaction have also been advanced MacInnis and Price Finally, imagery has been hypothesized to accompany hedonic consumption activities Hirschman and Holbrook ; Holbrook and Hirschman One area that has generated considerable interest elsewhere is the study of individual differences in imagery processing. Three areas of interest are studies of individual differences in 1 imagery ability 2 imagery processing style and 3 imagery content. These areas are of interest both for their direct and moderating roles on the processing on consumption-related information. This paper reviews measures of individual differences that assess these dimensions. Additional nonempirical criteria such as the logical relationships between constructs and measures in a network of relationships must also be considered Peter and Churchill Table 1 summarizes the paper and serves as a framework for discussion. Imagery vividness has a known moderator effect on incidental learning see Forisha , review , discriminative reaction time Gur and Hilgard , and emotional and physiological arousal Drummond. White and Ashton , Grossberg and Wilson Betts Questionnaire Upon Mental Imagery. The Betts Questionnaire Upon Mental Imagery QMI assesses imagery vividness in each of seven sensory modalities visual, auditory, cutaneous, kinaesthetic, gustatory, olfactory and organic. Five items assess vividness in each modality. For example, respondents rate the visual clarity of the sun as it sinks below the horizon visual modality. Using a seven point response scale, respondents indicate the extent to which images are 1 perfectly clear and as vivid as the actual experience to 7 no imagery present. Initially developed as a item questionnaire Betts As Table 1 indicates. Women tend to score consistently higher than men Sheehan ; White, Ashton and Brown ; Durndell and Wetherick Moreover test-retest reliability declines substantially as time between the tests increases. Some Divesta et al ; Durndell and Wetherick have also reported social desirability effects with this scale. Inconsistent results have also been found in determining the factor structure of the scale. Richardson proposes that the scale measures a single factor, however, White, Ashton and Law identified several factors. One was comprised of sensations that are chemically activated taste and smell. A third factor labeled suggestibility and social desirability was also found. Use of the scale needs to be made with the precise needs of the investigator in mind. The QMI is a scale of multisensory imagery,-however it is often improperly used to predict performance on visual tasks. While the Betts QMI assesses imagery vividness as a multisensory construct, Marks Vividness of visual imagery Questionnaire IQ Marks is designed to assess the vividness of visual images. Respondents use a five point scale to indicate the extent to which they can clearly visualize four variations on four familiar scenes. For example, one question asks respondents to visualize a shop they often frequent. Respondents imagine 1 the overall appearance of the shop from the opposite side of the road 2 a window display with individual items for sale 3 the color, shape and details of the door 4 images of entering the shop. Marks originally advocated that respondents complete the scale twice, once with their eyes open and once with their eyes closed. However Dowling found that the 2 methods produced identical scores. The scale correlates significantly with the Betts QMI $r = .$ Gur and Hilgard believe the process of completing this scale is more interesting than the QMI. Moreover, questions for this test may generate more vivid images than questions for the Betts scale because they deal with familiar and hence highly imageable scenes. Questions also provide respondents with a richer set of cues which may make imagery more concrete and hence more vivid. On the other hand, because

questions ask subjects to hold in mind and alter images in a sequential format, the scale may also tap different imagery ability construct; imagery control Gur and Hilgard Thus, the discriminant validity of the scale may be problematic. The test-retest reliability of the scale is adequate, although not high, with reported reliabilities ranging from. Interestingly, Rossi found that although test-retest reliability for the entire scale was. He suggests that the scale may be reliable for most items, but unreliable for a few. The scale has also been found to correlate moderately with the Crowne and Marlowe scale of social desirability Childers, Houston and Heckler Tests of Imagery Control Imagery control refers to the extent to which one can manipulate, transform. It is distinct from the vividness construct since one can presumably imagine stimuli vividly without being able to manipulate them at will Richardson The control of imagery has been shown to influence a number of cognitive processes. Respondents use a yes-no response format to indicate whether or not they can "see" various modifications on images of an automobile. For example, respondents are asked to picture a car standing at a garden gate. They are then asked to picture the same car lying upside down. Next they are asked to see the car running along a road. Twelve items constitute the scale. Due to problems inherent in the initial scale, Richardson developed a modified version, changing the response format from a 2 to a 3 point format and reducing the scale from 12 to 11 items. The internal consistency of the VIC has been demonstrated repeatedly see Table 1 , and the test-retest reliability has been consistently found to be high. Westcott and Rosenstock , however found relatively low reliability coefficients, and hypothesized that the scale may not be unidimensional. Most of the variance in imagery control is attributed to those items that relate to physical manipulation or movement Morrison and White A new scale which focuses more specifically on these physical movement dimensions is likely to have a simpler, more coherent factor structure. Although few studies have examined the social desirability effects of the Gordon scale. Richardson conceptualizes a visualizer as one who prefers literal encoding e. A verbalizer is conceptualized as one who prefers linguistic encoding e. Processing style has also been found to influence recall and recognition of verbal and visual material Hiscock , Childers et al Richardson developed a 15 item scale called the VVQ designed to differentiate verbalizers from visualizers. Respondents use a true-false format to indicate the extent to which visual vs. The questionnaire asks such questions as: Unfortunately, internal consistency of the scale is relatively low. Childers, Houston and Heckler hypothesize that several factors may account for the low internal consistency. The mixture of items relating to preference and ability makes the scale multidimensional, and reduces its internal consistency. Richardson reported test-retest reliabilities of. Warren and Good , however, found test-retest to be quite low after 3 weeks, particularly for women: The Style of Processing Questionnaire. The 22 item questionnaire substantially modified VVQ visualizer items so that they more adequately reflect the preference dimension. In addition, the authors added a 4 point true-false response format. Items on this scale include such statements as: Moreover, a confirmatory factor analysis demonstrated the independence of visual and verbal components. Partial predictive validity of the scale was also demonstrated. Childers et al note that although one may score high on both visualizer and verbalizer dimensions, the term processing style is used to reflect a preference for one mode over the other. Thus one who scores either very high or very low on both dimensions has no preference for one mode over the other. Tests of Daydreaming and Fantasy Content and Frequency A final category of scales are general inventories of imagery content and frequency. These inventories measure a variety of constructs. Hence they have subscales which tap both vividness and control dimensions, as well as more general imagery content. Wilson and Barber ; developed a series of interview questions designed to assess imaginative involvement in fantasy. A modified version of the inventory was developed by Myers and is geared specifically for children and adolescents. Using a yes-no format, individuals indicate the extent to which they experience fantasies and feeling-related fantasies. Items assess both current imaginal experiences as well as childhood experiences. Using a large sample N Myers found internal consistency of the inventory to be. An exploratory factor analysis, yielded a complex factor solution. Fourteen factors were identified from the inventory. These include "living in a make believe world," "vivid pretending," "vivid memories," and "mental adventures. However, the extremely complex factor structure of this relatively small inventory suggests that further refinements are needed. Caution must also be exercised in assessing the validity of the inventory. Specifically it is not clear

whether respondents, particularly children, can accurately and adequately report on inner experiences from their past. The Imaginal Process Inventory. Several general inventories assess individual differences in a more specific part of imagery; daydreaming. Daydreaming is conceptualized as spontaneous and often task-irrelevant inner dialogue involving multisensory images. The content of these inner dialogues often reflect "current concerns" or "unfinished business. A modified version of the scale was developed by Singer and Antrobus. A shortened version containing 45 items 7 subscales was developed by Huba et al

2: Object-Spatial Dissociation in Individual Differences in Visual Imagery

Individual differences in imagery and autobiographical memory. Imagery abilities clearly differ across individuals. Despite evidence for a strong role of imagery in remembering, how such individual variations relate to memory performance has not been adequately investigated.

Imagery processing can influence how consumers respond to marketing stimuli. Understanding how consumer, use imagery in their multiple senses will allow us to realize the benefits that effective use of imagery offers. This paper discusses individual differences in imagery ability, single sensory vis-a-vis multisensory stimulation and neuroscience perspectives on processing in various senses to provide background for testing marketing issues. For example, when choosing bakery products, what is expected? Should the baked bread smell fresh? Must the croissant feel crunchy? How should it look? Does it sound crispy? How about the last exercise program you adopted? Did the music you heard or the appearance of the instructor influence you? What odors do you remember? Do you exercise with a videotape or audiotape, or do you prefer a direct experience at a facility? Furthermore, how are recall, perception, and evaluation affected by whether you can image your experience by either seeing, hearing, touching, tasting, feeling, or smelling it? Marketing stimuli can appeal to a variety of consumer senses. Consumers often use imagery in multiple senses to experience marketing stimuli. Understanding how consumers use imagery through their senses can substantially improve marketing effectiveness. Marketers have a wide choice about how to present their products and services. New opportunities have arisen with the advent of widespread ownership of videocassette recorders, tele-shopping, talking point of purchase displays, smell strips and powder strips. Some marketing tools are more vivid than others. Consumer responses to marketing stimuli are, in part, determined by how vivid these experiences become in imagery processing. How can an understanding of imagery be used most effectively to market a service or product? Several questions that arise include: The information processing paradigm has shown that different consumers use different skills and strategies to evaluate information e. This research has been extended to compare verbal versus imagery processing Childers et al. While there is recognition that imagery occurs in multiple senses, the role of the various senses has not been explored. Since consumers often use their auditory, visual, kinesthetic, tactile, taste, and olfactory senses to interact with their environments, and imagery can be a strong mediator of individual experience, it becomes important for consumer researchers to understand how imagery operates in these senses. To begin an inquiry into the role of imagery in the various senses for consumer processing, a review of the theoretical underpinnings and evidence regarding how people use their senses is useful. An excellent review of psychological and marketing research perspectives of imagery processing is available MacInnis and Price, , and thus will not be repeated here. This paper will add to the literature by introducing some new background that relates to imagery. Following a brief introduction on mental imagery, this paper will discuss evidence on individual differences in imagery ability, single vis-a-vis multisensory stimulation and neuroscience perspectives on processing through various senses. In every case where auditory ranked first, visual was a close second. In 5 cases where kinesthetic was ranked first, visual was ranked second in 3 and auditory was second in 2. In another study, Natazde suggested that the incidence of illusions [Illusions are the mental representations generated as a result of asking subjects to imagine a specific stimulus. Illusions attributed to verbally aroused images were experienced by professional actors Actors experienced vivid images of "scenes" while ordinary subjects experienced more abstract mental activity. This was attributed to the "figurative imagination" possessed by the actors and not the ordinary subjects. The possibility of demand effects indicates that this type of experiment should be replicated using more objective tests to differentiate subjects on imagery ability. In a study of 64 scientists, Roe attempted to show that individual differences in "symbolic habits" are related to differences in occupation. She found a pattern of relationships between habitual type of "symbolic" activity and scientific field. Biologists and experimental physicists were predominantly in the visual imagers group, while theoretical physicists, psychologists, and anthropologists were concentrated in the group that reported habitual use of verbal -symbolization. She also investigated the

profession of the fathers of these scientists and found that the fathers of most verbalizers were in "verbal professions" e. Additional studies have investigated individual differences in imagery ability and how they affect learning and memory. Davis found positive correlations between recall and individual differences in imagery as measured by subjective reports. Sheehan concluded that vivid imagers perceive literally, while poor imagers use semantic coding devices to organize their perceptions. Several studies that measure imagery ability have shown that good visualizers recall pictures more accurately than poor visualizers. Good visualizers produced a significantly higher short term recall for all types of material, especially with concrete words. In a long term task, good visualizers produced significantly higher recall for both concrete words and pictures, but not for abstract words. Differences in imagery ability have also been correlated with voluntary control of autonomic processes. For example, White found that ability to control salivary flow through voluntary imaging is related to reported vividness of imagery across all sensory modalities. Another study showed ability to increase heart rate through voluntary imaging is positively correlated with reported vividness of visual imagery Carroll et al. Hirschman and Favaro also found a positive correlation between ability to increase heart rate through biofeedback training and reported vividness of auditory and visual images.

Multiple Versus Single Sensory Stimulation

Studying the role of multisensory versus single sensory message stimuli can help elucidate the role of imagery ability in various senses in influencing consumer processing. There are two possibilities: Some theorists suggest that there is a central processing system that all incoming stimuli pass through before continuing on to the next specialized sensory system. This would suggest that multisensory activation, an overload of stimulation, or perhaps only certain types of conflicting multiple sensory activation, may cause interference in the central processing system. In this case, processing may be more efficient for a single sensory vis-a-vis multisensory stimulation. Given the complex interaction among the senses, the question is not whether complementarity among multiple channels or conflict among multiple channels occurs at all times, but under what conditions each mechanism operates. This is probably a function of characteristics, such as, the nature of the stimuli and how information processing occurs among the multisensory processing system. For example, for complex unfamiliar stimuli, imaginal processing that results from stimulation of a single sense may enhance the needed concentration for effective processing. Multisensory stimulation of complex unfamiliar material could be expected to create a great deal of noise and thus, interfere with the clarity of imaginal processing, causing an overload phenomenon. Therefore, one may hypothesize that: For complex, unfamiliar stimuli, single sensory stimulation is more memorable as compared with multiple sensory stimulation. Similarly, when simple familiar stimuli are processed, imaginal processing in multiple senses may -be well coordinated. Thus, in this situation, multisensory imagery may enhance the vividness of the imagery experience. For simple, familiar stimuli, multisensory stimulation is more memorable as compared with single sensory stimulation. Ahsen discusses the possibility that, in certain people, visual imagery can be so powerful that it prevails strongly and curbs other senses. A strong visual image can create resistance to the recall of other sensory images and causes distortion in the perceptual system. Segal and Fusella showed that generating irrelevant visual images impairs visual signal detection more than irrelevant auditory images, while auditory images produced more interference in an auditory detection task than did visual images. Segal and Fusella demonstrated similar modality-specific interference in a total of six different sensory modalities vision, audition, touch, smell, taste, and kinesthesia. In reviewing this data, Marks in Sheikh, , p. In contrast, research on opinion change indicates that audiovisual messages induce greater opinion change than auditory i. Understanding the effects of individual differences and studying the results of processing stimuli directed to various senses should help resolve these questions about when multiple sensory and when single sensory stimulation is most effective. A related concept is vividness of the stimulus. Marketing researchers have explored the effects of vividness on memorability and cognitive structure. Kisielius and Sternthal presented brand information to subjects using either sentences alone low vividness condition or sentences and drawings in combination high vividness condition. A subsequent recall test showed that more brand information was recalled when sentences and drawings were presented in combination. They postulated that vivid stimuli enhance cognitive elaboration, resulting in the development of more storage in memory, and hence a greater likelihood of the information being available for subsequent recall tasks. The

effect of the composition of visual stimuli on recall has also been explored. Lutz and Lutz In a paired-associate learning task, they found that the integration of the information into a single image increased recall of that stimulus. It is interesting to note that in these studies the "multiple" stimuli, i. Enhancement may occur because when stimuli enter through the same channel and they are synchronized, they reinforce each other. This should be distinguished from stimuli entering the mind through two different channels, i. One additional perspective on the effects of multisensory imagery derives from experience in clinical settings. The role of multisensory stimuli in clinical patients may provide clues for predicting processing by non-clinical individuals. Brown explains that the multisensory nature of some hallucinations may be important to the veridicality of the image experience. A hallucination which involves only one perceptual modality can be disconfirmed by the other senses. A hallucination which shares elements of two or more modalities reduces the effects of the objective world for informing the viewer that his hallucinations are false. An anecdotal example is a patient reported by Hecaen and Robert Brown An auditory hallucination was recognized as false until the visual component of the hallucination appeared, at which point it was taken for a real perception. It is possible that multisensory stimulation may affect the believability of an imagery experience in nonclinical individuals as well, particularly for individuals who are strong imagers. Clinical settings provide other background that may be useful to understanding consumer behavior. A large amount of research has been conducted in the neurosciences on how the brain functions and malfunctions in clinical patients. While the wide range of normal brain function is not the main focus of clinical studies, concepts gleaned from normal subjects, who are observed in this type of research, can provide useful insights for studying consumer behavior. Therefore, neuroscience perspectives are presented next so that they can be used to address marketing issues. For example, there are specific pleasure centers. Other regions of the brain are, in large part, responsible for auditory, visual and kinesthetic sensory activities. Furthermore, different regions are responsible for different levels of processing, i. An enervated primary region fires electrically and sends impulses to the secondary region which begins to "develop" the nature of the stimuli.

3: Memory - The Levine Lab

Individual differences in preference to the linguistic or imagery code in cognitive activities were also found by asking people to describe their mental representations while performing different.

The AI provides a wealth of information concerning elements of naturalistic autobiographical memory. Most importantly, the scoring method separates episodic details into internal and external details. The AI has been used in over 100 studies in healthy and patient samples [click here for a full list](#). It has proven useful to test theories concerning the nature of memory loss in patients with medial temporal lobe damage Addis et al. Other studies have adapted the AI for assessment of autobiographical memory in typical and atypical development Willoughby et al. Our study showed that when these demands were minimized, a significant reduction in internal episodic, but not external details was observed, indicating that the overgeneral effect in depression cannot be fully accounted for by executive impairments. We are currently investigating the neural substrates of this phenomenon using functional neuroimaging.

After 30 terrifying minutes in which the passengers and crew prepared to ditch into the ocean, the pilot miraculously glided the jet to an Azores airbase with no injuries. Using the Autobiographical Interview, we showed that memory for details of the Air Transat disaster was greatly enhanced, but this enhanced vividness was not associated with the presence of post-traumatic stress disorder PTSD; McKinnon, Palombo et al. On the other hand, those with PTSD generated an excess of external details. This effect was observed for all events tested, not just the Air Transat disaster, suggesting that strategic control over memory may be altered in those who develop PTSD. These findings may be useful in understanding why some develop PTSD while others do not, even when exposed to the same traumatic event. We next probed the neural correlates of traumatic memory enhancement in a subset of passengers scanned with fMRI 9 years after the Air Transat disaster Palombo et al. Behavioral PLS analysis results showing correspondence of memory vividness internal details from the Autobiographical Interview for the AT disaster and September 11, with amygdalar activation.

Individual differences in autobiographical memory Some remember events vividly while others have only a vague recollection of the same events. Similarly, some efficiently access factual information, such as news events or trivia, whereas others do not. We believe that "trait mnemonics" reflect potentially valid individual difference characteristics, much like personality traits, that may have implications for cognitive function. Endorsement of high factual or semantic memory showed a different pattern: These findings suggest that individual differences in how people remember the past correspond to functional brain organization at rest. One way to study memory abilities is to manipulate or interfere with them in an experiment. This study reinforces a link between visual imagery and memory. We found that these individuals had reduced visual memory on laboratory tasks, reduced right hippocampal volume, and reduced activation of the canonical autobiographical memory network during fMRI scanning. This latter finding suggests that intact memory performance and day-to-day memory function in SDAM is may be supported by non-episodic processes e. More information about SDAM can be found [here](#).

Functional neuroimaging Functional imaging techniques enable the examination of the neuroanatomical correlates of memory in healthy adults, complementing our behavioural research in aging and clinical samples. This method allows for a high degree of control over autobiographical stimuli that cannot be attained with retrospective methods that are typically used in functional neuroimaging studies of autobiographical memory. Using this method, we have demonstrated distinct networks associated with vivid recall of verified episodic and semantic autobiographical information Levine et al. Magnetoencephalography MEG data using this paradigm have been used to show how coupling or synchrony of theta oscillations in medial temporal and anteromedial prefrontal regions support subjective vividness in autobiographical recall Fuentemilla et al. Current studies are investigating the effects of depression, trauma, individual differences, and visual imagery on patterns of brain activation associated with autobiographical memory.

4: Personality and Individual Differences - Journal - Elsevier

INDIVIDUAL DIFFERENCES IN IMAGERY pdf

This approach is an improvement over previous, studies of individual differences in imagery abilities, which typically provide no evidence that the tests or questionnaires are measuring some aspect -of imagery per se.

5: Individual differences in imagery (Book,) [www.enganchecubano.com]

The experiment examined the relationship between individual differences in imagery ability and physiological activity during affective and non-affective imagery. Self-described good and poor imagers were assessed before and after a training procedure which encouraged somatovisceral involvement in.

INDIVIDUAL DIFFERENCES IN IMAGERY pdf

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