

9. The Interest dimension

The brilliant mathematician and mnemonist Alexander C. Aitken (1895-1967) said that if he lacked *interest* in a subject, he would not engage in memorizing it. Although interest was not the only relevant factor behind the astonishing feats of memory that professor Aitken performed, it was apparently a necessary one, and not just a factor that added to his numerical, narrative or schematic ability.

It is obvious that Aitken's ability to verbally recall the 2000 initial decimals to pi was based both on his interest in mathematics as well as poetry, because he mastered this feat by dividing the digits into groups of five, and then learning them as one learns a blank verse, i.e. in a special rhythm. Aitken's memory for collegial meetings (sammanträden) was also extraordinary, and probably dependent on his interest in them (Baddeley, 1997; Neisser, 1982).

Eysenck (1972) shows that the more distinctive or unusual information is, the better it is remembered. He also argued that simply thinking of memory in terms of levels of processing (Craik & Lockhart, 1974), could not account for the variability in how information was remembered (Eysenck, 1985). There is something inherently cognitive in interest that is different from motivation.

Interest may be measured regarding occupational interests using The Kuder General Interest Study (1971), that may help educational psychologists guiding students especially in junior high in their choice of study and career. The Strong Interest Inventory (1927) is based on six categories of questions, see table 9.1. Below.

Table 9.1. Strong Interest Categories

Area	N of Questions
Occupations	107
Subject Areas	46
Activities	85
Leisure Activities	28
People	16
Your Characteristics	9

9. 1. Interest versus motivation

Is interest a mnemonic dimension of its own or would it not rather be decomposed into the last dimension Automatic vs. effortful, see chapter 11, or motivational or emotional effects on memory? Regarding the Automatic vs. effortful dimension it is obvious that if one invests great effort into learning or gathering information of a specific kind, one does that based on great motivation. Would it not therefore be the case that interest shows to be just one of many aspects of motivation? However, in the current account of memory dimensions we postulate that effort reflects motivation in general, while interest, although being a conative aspect of cognition, is more specific. And we might say that you act because you are motivated to do it - extrinsically or intrinsically - but you get interested in something without any purpose, without any obvious motivation. Your interest is awakened by a perception.

Before delving deeper into the issue let us look at a couple of definitions of motivation: Elliot & Covington give a learning definition based on approach vs. avoidance behavior (2001). Other theorists refer to motivation as an inferred need, desire or impulse which initiates, directs and sustains actions (Coon, 1997; Wood & Wood, 1996).

Then motivation is simply what makes a person choose a certain act or refrain from it, as was said in the above paragraph. In contrast to that interest is related to the activity or object as such, not any manifest action. You may be interested in golf or football without considering paying entrance to a Premier League match or taking an extra lesson from the golf pro at the club or even visiting a golf course. I stayed at a bed & breakfast close to a golf course, and was guided there by the b&b-owner, who turned out to be a keen viewer of golf tournaments, but he had never made a golf shot although he lived a hundred meters from the course.

Arguments in favor of the notion that interest is a motivational concept rather than a cognitive one apparently regard it as a part of or instigation of action, i.e. if you are interested in a certain activity, then you tend to be active there. This may be true, but is not to the knowledge of the author not studied empirically. And the argument also goes: in order to engage in a certain activity you have to be interested in it. However, there are a multitude of people who are interested in football without ever touching or kicking a ball. The

manifestation of their interest is their limited to passively watching football on TV. Further we may note that there are many high-school students who attend to their sports classes without being the least interested or even the least rewarded for doing that. They attend halfheartedly simply because they have to, guided by negative reinforcement, because otherwise they will leave school without a complete record.

Why football becomes spectacular and make people spend hours watching matches may be an issue of its own, but here we are interested in if watching football as a leisure interest is explained by motivational *or* cognitive cues. The issue is similar to the question why people watch the news everyday. It is also similar or analog to the question why people go to the theatre in order to see a new version of Hamlet. What is common to all these activities is the wish to know more about something: we watch the evening news in order to fill in gaps of our current picture of the world, we are part of a theatre audience watching a 100th version of Hamlet in order to see how the crew at the theatre manage it this time, and a large number of us watch the Champions league to see which teams will win this night. It may be that we get aroused, disappointed or angry due to what is shown, but these are side effects of being interested and not any primary reason for the activities mentioned. It may also be that the TV-news makes for a break of the general boredom of our daily routines of everyday life when nothing really exciting happens. The view of the author is that there are certain aspects of football in general that catches the interest of the football fan, just as there is something in popular music that catches the interest of people, and for the music consumer who becomes bored by the obvious similarity between pop or country songs, the interest may fade, and move to other genres.

It would be rather awkward to explain a person's interest in elisabethan theatre or Shakespeare in terms of typical motivational constructs as rewards or needs, because one is neither rewarded nor punished for going there. If you are a critic or an english teacher visiting a theatre you may need to go there, and you may even be expelled from your work as a critic if you stay home. However, if you are genuinely interested you go there to see how the director has chosen how to organize the scenes, and you may want to know what actors were engaged, etc. For the really interested person there are intrinsic aspects of the event that are important, not any personal or motivational aspects of it.

Before leaving the conceptual analysis of interest vs. motivation, we have to mention the intrinsic interest in beauty. Aesthetic subjects tend to draw our attention without any consideration of benefits or disadvantages or drawbacks. We may return to this in the discussion of the orienting reflex or response (see page 9.5), but it may already be said that the search for beauty, harmony or other aesthetical values may be quite similar to interest. They share a core human orienting reflex if you will. Curiosity is a third member of that family of human orienting reflexes, that may also be present in other species.

In an influential article by David Wechsler he said that intelligence tests should include conative aspects, and not just intellectual tasks (1950). Perseverance and consciousness were mentioned among the conative aspects discussed by him. Although the developer of the WAIS scales would prefer such an expansion of intelligence tests it is still - more than 60 years later - uncommon that the investigating psychologist tries to objectively measure those traits. Instead subjective judgements are made or at best, a questionnaire is passed to the test person regarding the conative-cognitive side of the personality. Whatever happens regarding clinical intelligence examinations, it is important in the current case, however, to see how interest, curiosity, and perseverance may improve memory.

It is obvious that the borders between genuinely cognitive or motivational aspects of interest or motivation are not that easy to define, and there may in fact be a grey zone in between them. A football expert may in fact be emotionally involved in a specific team, perhaps due to a former career as a coach or player there. But as a commentator the interest in the game as such may succedingly take over and then it becomes hard to know where his alliances rest. The commentator then becomes less and less motivated to praise or debunk his favourite team.

It may also be argued that intrinsic motivation is close to the definition of interest, i.e. if you are motivated to engage in a leisure activity because the activity as such is stimulating or intellectually rewarding, then you are interested in it, and if you are externally rewarded in any way, then you may not be regarded as interested in the activity, but engage in it for emotional, social or other reasons. However, as was already mentioned above, there is an apparent difference between being interested in an activity, and being motivated to manifest your interest by engaging in it physically. In line with Julius Kuhl one may actually say that before the initial phase of acting (*Intention*), one may sometimes contemplate to be involved

in an interesting activity without planning to take one single step in the direction of being part of it (Kuhl, 1993).

However, there are many activities that are intrinsically rewarding, for instance making love, eating a delicious dinner, or participate in choir singing. Such activities may not be externally motivated by awards, because they are in themselves rewards (Skinner). However, you may be involved in all these activities without being especially interested in them. It is perfectly clear that there are many lovers who are really interested in the subject sex, i.e. they may read text-books about variations of positions in bed or they being regular consumers of porn, but such interest in sex is on another level than the immediate intrinsic reward or need for and during intercourse that is directly related to basic motivational constructs (Maslow, 1943).

It may even be that a person interested in sex does very seldom engage in it physically. The same holds regarding dinners: it may be that the connoisseur is both interested in how the dish was made, and is immediately enjoying the meal. But it may also be the case that enjoying the dinner does not evoke any interest of the kind. The author was a participant in a choir several years ago without ever trying to understand arrangements on a deeper level of expertise though his interest in composition and music in general is great.

In order to argue for *interest* as a broad memory dimension of its own, we thus have to analyse it, as we try to do above, and show how it belongs both to the cognitive domain and to the conative. The strongest argument in favour of this notion is that *people may invest effort in trying to recall something without being interested in the subject*, in school or at work, in order to perform their tasks, and their interest in these tasks may not increase at all depending on how much effort they invest in them.

Paul Silvia also takes the stand that interest is related to curiosity and that it is important in learning and personality (2005, 2008). However, he regards interest as an emotion not as a kind of orienting response or reflex, see page 9.8.

9. 2. Interest and attention

A second argument for interest as a memory dimension regards attention. A person interested in memory research is automatically directed towards reading articles about new findings in memory area such as Alzheimer's disease, the neuroscience of hippocampus, or memory and ageing. This person is probably able to relate new findings to her/his current personal picture of the current research in the field, especially if a new article fills a gap in the understanding of the subject. This has nothing to do with motivation, because the will was not necessarily directed towards the goal of filling this gap. An analog to this is when you learn that the only way to add three numbers into 7 without repeating any of them is $1 + 2 + 4$, or the only way to add four numbers into 11 without repeating any of them is $1 + 2 + 3 + 5$. Such knowledge of numeric rules borders on nonsense - for most people -, and not many eyebrows are raised when people are told about these facts. Kakuro solvers, however, may still find similar peculiarities interesting, but will not necessarily motivate them to solve more or less kakuros in the future, and it is far from probable that they will attend numerical analysis classes. The point of the author is that there is something intrinsic amusing in numeric games or puzzles that draws the attention of kakuro solvers.

The argument here is that the tendency for people to understand relationships in general is innate, and forms the basis for interest: what is common for puzzles is the expectancy for the parts of a puzzle to fit into an integrated picture. There is no fundamental difference between a memory researcher who fits a new bit of information into his general knowledge of the field, a kakuro solver who looks for the missing numbers, or a one year old baby who tries to fit a piece into a hole on the top of a wooden box.

The interested person may be inclined to read and gather information about a certain scientific field not because of any emotional or motivational "reasons", only for seemingly pure or intellectual reasons, i.e. to know and understand more about the world.

If you are interested in golf, then you will probably follow the PGA tour finals on TV. Interest in such a phenomenon is akin to the heightened interest in the question of who will be the next winner of the Nobel prize in literature. You may have invested time in reading certain authors, and may be interested in whether any of these authors will have a chance to win the title. But both of these quite different interests are different from being motivated to

take action in any related activity. You may become disappointed if your favourite author or your favourite player does not win a title. But your interest in literature or golf is not necessarily diminished or increased. The novel reader will not necessarily stop reading a thick book by Joyce Carol Oates just because she did not get the Nobel prize this year either.

An interest may be described as being engaged in a leisure activity, but this engagement may be exclusively perceptual. As was mentioned above, an interested person may not be pursuing the activity at all. There are thousands of interested golf-, snooker- or poetry fans that never make a golf shot, participate in a snooker game or write a single line of poetry. The correlation between manifested interests and manifested activities is not perfect, and probably very low, the number of relatively passive fans in the mentioned activities is far greater than the active performers in the fields mentioned.

The conclusion is that interest is primarily a cognitive concept, and that interest is regarding perception, not action.

9. 3. Effects of interest in learning and memory

In a review by Suzanne Hidi (1990) the effect of interest on memory was analysed into text-based and individual interest factors. Schiefele & Krapp (1988) showed that high interest produced qualitative knowledge differences in learning. Hidi also gives examples of text passages that generate further reading: "No advertising is allowed on Swedish television and there are no commercial stations" (written in 1983, ten years before TV3). It may be noted that text-interest effects depend on surprise, that is related to the orienting response, see next section. has been studied reviewed in a variety of contexts, including neuroimaging, reward-based effects, and education (Hidi, 1990; Kang et al., 2009; Murayama & Kuhbandner, 2011; Renninger & Hidi, 2011).

Interest may be evoked by the items involved in a test. In a recent study it was shown that post-answer interest may have an impact on memory consolidation (McGillivray et al, 2016).

9. 3. 8. 2. Interest and the orienting response

9. 3. 8. 3. Interest and novel detection

9.3. 8. 4. How interest has been measured

9. 3. 8. 5. Interest and physiology

Sokolov (1972) showed that muscle tonus decrease when there is a lack of interest. On the other hand deceleration of heart rate has been found when people experienced something interesting, but at the same time a pupillary dilation was registered (Libbey, Lacey & Lacey, 1973).

9. 4. Interest, depression and dementia

Sidney, H. Kennedy reviewed the core symptoms of major depressive disorder mainly based on The Hamilton rating scales (2008). They were depressed mood and loss of interest or pleasure in nearly all activities in addition to a number of motivational, social and physiological dysfunctions.

Table 9. 1. Core symptoms from three scales derived from the Hamilton Depression Rating Scale. (from Kennedy, 2008)

Symptom from HAMD-17	Percent endorsement		Change score Cohen's d	
	M	F	All	
Work & interest	99	98	99	1.84
Depressed mood	98	98	98	1.81
Anxiety-somatic	86	92	90	1.03
Suicide	77	72	73	0.88
Energy	98	94	95	0.88
Guilt	86	85	85	0.86
Anxiety-psychiatric	59	90	79	0.83

HAMD-7: A brief measure of remission. HAMD, Hamilton Rating Scale for Depression Adapted from ref 20: McIntyre R, Kennedy S, Bagby RM, et al. Assessing full remission. J Psychiatry Neurosci. 2002,27:235-239. Copyright © Canadian Medical Association 2002

Because both loss of interest, as a cognitive factor, and depression are important negative factors behind dementia it would be helpful to analyse them separately. However, we may also treat the topic as a two stage phenomenon beginning with depression or beginning with interest, depending on what would be the best way to treat a patient.

Why would a person lose interest in an activity or a subject in the first place? Is it reasonable to treat loss of interest a priori as an effect of depression? Obviously not. What is meant by "loss of interest in almost all activities" is something very different from when a person disregards certain activities because other activities are more interesting. Actually the phrase "loss of interest" hides the motivational aspect of interest, and if depression is analysed using

factor analysis it has been shown to be divided into two main factors, motivation and mood (Montgomery & Åsberg, 1979).

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