

The Meeting Minds Report

**A study in association with Yorkshire Tourist Board and Dr
Lawrence Smith**

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Dr Lawrence Smith
Institute of Psychological Sciences
University of Leeds, Leeds, LS2 9JT, UK



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RHYTHMS OF LIFE

Introduction and Aims

Introduction

The way time is filled with activity or rest is a feature of all our lives no matter what the situation. Very often, much of our concern is about what we do with our time, the scheduling of activities and how we manage time. We worry about there being enough time to do the things we have to do, and if not, what do we cut down on to fit everything in? However, there are other time-related issues that are less well considered despite being fundamental to how we function as human beings. Most of us alternate between periods of rest, or sleep and activity of some kind or another and we are constantly subject to demands made upon us by changes in our environments. Very often we find ourselves in different circumstances and locations whether for work, education or leisure. The way we respond to these changes and cycle through different types of behaviour through each day is of crucial importance to both our well-being and how we perform on whatever event or task is before us.

Why do this study?

While these human cycles and rhythms have been explored for their impact on shift working (and have informed the formation of shift rotas), and to some extent with schooling (timing of physical vs. intellectual activities), no one has looked at what this means for the business community in terms of the timing of activities at meetings and conferences. The level of productivity of people working normal office hours (9 – 5.30pm) in the UK is undoubtedly worth millions to the British economy, and huge sums are spent on conferences and meetings each year. However, there has been no exploration of how to harness what we know about human psychology and rhythms to improve effectiveness in these contexts.

Aims

Based on a broad range of research evidence, the aims of this review are to:

- Highlight some of the fundamental aspects of how we respond and behave in relation to internal and external rhythms, and time of day.

- Explore the importance of maintaining a good sleep-activity cycle.

- Investigate how people differ in their preferences for the timing of activity and rest over the day according to the rhythms driven by the body clock.

- Introduce suggestions for how this knowledge might be considered or inform the organisation of events, and suggest what the above mean for:
 - Conference delegates or those attending meetings
 - Conference organisers
 - Speakers at events

Rhythms

Research background

Human beings have evolved on a planet subject to regular cyclic changes to the environment. The world tilts and spins on its axis resulting in night and day, and changes in temperature. It also orbits the sun to give seasonal cycles. Life on earth has therefore developed to reflect these fluctuations in the environment. We have been born into a world full of rhythms that influence our lives and which we reflect in our biology, thoughts and behaviour. This document provides a review of some of the fundamental issues relating to the roles played by rhythms in our lives, including the way behaviour can change at different times of day, the importance of the sleep-wake rhythm and how people differ in their preferences for activity and rest over the 24-hour day.

Slaves to the rhythm

Rhythms are found in most complex dynamic systems, including the human body. A number of types of rhythm have a bearing on human behaviour but there is much interest in rhythms that reflect the 24 hour cycle of day and night. These are called “circadian rhythms” (pronounced ‘sir-kay-dee-an’) a term coined by researchers in the 1960s from the Latin, ‘circa’ - about and ‘diem’ - a day (i.e. rhythms that have a cycle lasting about a day). Most of our physiological functions and many mental processes and behaviours show rhythmic activity over 24-hours. For example, rather than remaining at a constant 37°C at all times, body temperature has its lowest point between about 4am and 6am after which it gradually increases through the day to peak during late evening (8pm-9pm), a fluctuation of one or two degrees. Alertness levels drop sharply through the small hours of the night and rise through the day. Levels of the sleep-related hormone, melatonin, is low through the day but increases from around 8pm-9pm to peak in the early hours (2am-4am), precisely when it is most difficult to resist falling asleep. Along with all other physiological processes, these rhythms are entrained to the 24-hour day-night cycle, but are also ‘driven’ by what is commonly called the ‘body clock’ - a small cluster of cells in the hypothalamus of the brain.

We are also subject to other rhythms, some that take a split second to complete (such as nerve impulses), others that take from an hour or two (such as the stages of sleep, rest and activity cycles) up to 12-hours or so (e.g. sleepiness rhythms), and yet others that run beyond 24-hours such as monthly and seasonal cycles. Much of our knowledge about rhythms stems from research into daily cycles, disrupting the natural 24-hour rhythm and the effects of doing particular activities at certain times of day. These factors are the focus of this review.

Evolution

Why have 24-hour rhythms developed to become so important in our lives? Basically, we have been ‘hard-wired’ by evolution to be daytime active and less active or asleep at night. Circadian rhythms, with a cycle of about 24-hours, are not simply a response to changes in the environment. Rather, they are controlled by the internal biological clock and our capacity to both keep and tell the time. Circadian rhythms confer an advantage because they anticipate changes in the environment. Our bodies and brains are primed to be ‘up and running’ for activity early in the day and to wind down in preparation for rest, recuperation and sleep at night. A major function of the circadian system is the regulation of sleep and wakefulness. Nevertheless, although rhythms are driven by the biological clock, much of their variation is also a function of external factors such as time cues in the environment (for example, the light and dark cycle) or level of social activity. Therefore, circadian rhythms are, under normal conditions, synchronized to form a dynamic but relatively stable system from day to day.

Breaking the shackles of nature

A cautionary note that forms a subtext to this review is worth raising here. It is linked to the evolutionary drive for us to be ‘in-synch’ with natural rhythms. That is to say, as we have emerged into modern society and developed technologies, humanity has tended to divorce itself more and more from the natural rhythms in the environment. We are no longer governed by the need to avoid

predators, to seek shelter and refuge during darkness, and to be out foraging and hunting early in the day. Our behaviour is no longer so governed by the cycle of day and night or seasons. Human invention (e.g. artificial light) and societal imperatives mean that we can colonize the night, we can eat-into what should be our 'down-time' and not listen so attentively to the ticking of our internal clocks.

What goes around, comes around

So, potential impairment exists because humans have evolved so that the daily rhythms in their physiology, hormone levels, biochemistry and behaviour have become 'tuned' to the most reliable and predictable cycle of changes in the physical and social environments.

The timing of functions and processes at the individual, organisational, societal and environmental levels are generally synchronised. Consequently, the desynchronisation of these processes that can stem from irregular activity, regular sleep loss (for a multitude of reasons) and/or regular night work lies at the heart of the potential for disruption to individuals, families and employers.

Implications

There is a lesson to be learned by those who draw-up business activity schedules, whether they are for work within an organisation or in relation to events such as business meetings and conferences. The impact of poorly designed schedules is particularly acute in relation to work and 24-hour work rosters and loss of sleep can affect productivity and effectiveness in a variety of ways, including: lower tolerance to stress, greater sense of stress, lower mood, greater irritability, decreased alertness at crucial times, greater fatigue, lowered motivation, performance impairment (including increased potential for errors and accidents), increased sickness absence (especially in relation to night work) and potential for greater staff turnover. That is to say, if we neglect our natural rhythms or try to work in opposition to them, there is a price to pay. Therefore, the effects of not paying sufficient attention to the potential for disruption that can occur are wide ranging and this could have significant implications for business effectiveness.

Sleep, Rest and Activity

Research background

One obvious 24-hour rhythm that we are subject to is that of sleep (typically during the night) and waking activity (during the day). One sleep researcher said that if it weren't vital to our lives sleep is probably the biggest mistake evolution has ever made because it puts us in a vulnerable state for substantial periods every day of our lives. However, we do know that sleep is as essential to humans as breathing and eating, we do more of it than any other single behaviour yet it is probably the basic necessity that is most regularly abused, the aspect of our lives that we 'eat-into' when we are busy or stressed or simply being sociable.

Interestingly, human beings are a little different from other species in that we tend to sleep in large blocks of time and alternate this with long periods of activity. This is in contrast to other animals that tend to have a number of sleep periods over 24-hours. Human sleep is likely to have evolved in the way it has to help us survive. We have poor night-time vision, poor sense of smell and poor hearing compared to the predators hunting at night. A mechanism (the body clock) that drives us to find shelter and to sleep is likely to have kept our ancestors relatively safe. The larger, more developed human brain also appears to require sleep to help maintain optimal nerve functioning and to aid memory processes in addition to providing the opportunity for rest and repair of the body.

Sleep structure

We know that the alternating of sleep and activity is another reflection of the 24-hour rhythms in our lives largely influenced by the body clock, and that even within sleep there are rhythms. These are shorter rhythms lasting about 90 to 100 minutes during which our sleep state moves through a number of stages in cycles through the night. We move from light to deeper sleep and then into dream sleep in 90 minute cycles with deep sleep becoming less prominent as the night wears-on and we approach morning. It has been suggested that these 90 minute rhythms (termed the basic rest-activity cycle) continue through the day and are reflected by aspects of our behaviour. For example, a tendency to fall into day-dreaming every 90-minutes or so through the day.

Sleep research has confirmed that there are rhythmic periods of vulnerability over 24-hours that parallel the natural rhythm in tiredness. These periods approximate a 12-hour rhythm and occur between midnight and 4am or 5am (when falling asleep is easiest), and during the afternoon between 1pm and 5pm. The late afternoon period of sleepiness is commonly referred to as the 'post-lunch-dip'. Typically viewed to be a consequence of a heavy afternoon meal it is, in reality, a reflection of the increased drive to sleep in the late afternoon which may be a remnant of our evolution from creatures that slept several times a day. Sleepiness and fatigue-related performance problems show a remarkable correspondence to the periods of vulnerability by showing peaks in the early hours after midnight, and less pronounced peaks during the late afternoon.

We sleep a lot

Close to one-third of our lives is spent asleep, e.g. in our lifetimes we could spend up to 25 years asleep (that's the human design plan at least) or put another way, some have argued that a person could sleep 175,000 - 200,000 hours in a typical lifetime. But how much sleep do we need? Received wisdom (resulting from scientific research) suggests a typical 'normal', healthy sleep period should be 7 to 8 hours a day. In a culture that has grown to revere the work ethic as good (i.e. a culture of 'workaholism' and 'presenteeism' has developed) too much sleep can be considered to be wasteful. In our busy modern societies there are many who would advocate less sleep, and see sleep as an obstruction to commercial progress, productivity and profitability. This parallels the view stemming from Thomas Edison (inventor of the electric light bulb) who believed that if sleep could be eliminated by banishing darkness then it would add additional work hours to the day. Consider that if you slept only 5 instead of 8 hrs per night you would gain 21 extra waking hours per week which gives 10,952 extra hours per decade! So do we sleep more than we need? Are we sleeping our lives away?

Despite some arguments that espouse the view that we only really need about 5-hours of 'core sleep' per night, in light of the prevalence of high levels of sleep problems and daytime sleepiness, the answer would appear to be unequivocally "NO" - we don't sleep more than we need! The real question should be - "*Are we getting enough?*". That is, given the knowledge that sleep is hugely significant to our health, well-being and safety, are we becoming a sleepier, less healthy, society? Consider that, when given the opportunity, most people would seem to prefer to sleep an hour longer than they usually do each day. In addition, we all tend to sleep longer at weekends and during holiday periods which, for many, is a reflection of our sleep debt built-up over the week.

Implications

People tend to overestimate the amount of sleep they achieve in a night so, we might think we are getting enough sleep, but in all likelihood we're not. On top of this, anxiety, work schedules, being in unusual circumstances, such as overnight stays while attending a conference or meetings, or a combination of these, can result in significant sleep loss because of changes imposed on habitual sleep-wake rhythms. For example, in the context of a conference at a new location, for some, complaints can include early awakening, feelings of getting too little sleep and not being rested after sleep, while others might have difficulty rising and facing the schedule for the day. Early morning starts to conference or meeting proceedings can be associated with not going to bed the night before at an appropriate time to accommodate the early start, difficulties falling asleep the night before, difficulty waking up and a strong sense of a lack of recovery after sleep and, sometimes, substantial sleepiness during the day. Clearly, this is not an ideal state to be in if there's important information to attend to or present. Sleep loss has also been linked to poorer mood levels and a general sense of poorer well-being, delayed or longer reactions, poorer decision making and a tendency to make mistakes. All of these might have implications for smooth performance during a business meeting or conference whether a person is a delegate or a presenter. Interestingly, repeated experience of acute sleep loss does not appear to result in a person becoming 'immune' to it. Perhaps unsurprisingly, the only real answer to significant loss of sleep is a period of good sleep - easy to say but much harder to achieve in reality. Nevertheless, it lies at the heart of good preparation for any period of potential sleep loss.

As a final implication relevant to daytime functioning it is worth noting that the mood that you bring with you to work, business meeting room or conference auditorium, can have a stronger impact on the day's overall mood and work performance than mood changes in the situation itself. Start of day mood affects subsequent appraisal of later events, i.e. how we see and react to events through the day. Sleep has an influential feed-in to our mood and consequently, anything that can contribute restful sleep is going to be beneficial in this respect.

Time of Day Effects

Research background

At first sight, there could be an impression that performance fluctuations over the day (circadian variation) are either minimal in magnitude and range, or more of a reflection of the contrast between poorer performance at night against better performance during the day. It is now evident that there are gradual changes in performance during the day that can be as great in effect as those associated with blood alcohol levels at the legal limit (this is especially problematic where fatigue is also a contributory factor). Note also with regard to the preceding section, that the consequences of poor sleep and sleep loss could exacerbate any decrements in performance at particular times of day. The following section presents an overview of evidence linking fluctuations in performance to time of day.

Attention and memory

In tests of attention and distractibility fewer errors are made during evening (between 6 and 8pm) performance compared to morning performance (between 8am and 10am). Performance on information extracting, checking and managing, clerical-type, tasks have shown time of day effects where afternoon (4pm) performance was superior to morning (10am) performance.

Early research suggested that morning performance appears to be superior on many cognitive (more complex) tasks (short-term memory, mental arithmetic) while afternoon performance was better on simpler tasks. The conclusion was that the load or demand placed on memory processes in terms of managing information is affected by time of day.

So, in this research with particular short-term memory tasks, where there was a high short-term memory load there was better retention and recall in the morning but better recall in the afternoon for the low memory load task.

Taking stuff in

Time of learning appears to have an influence on what can be recalled and when. Learning material in the morning favours immediate recall of information whereas afternoon learning has been associated with better delayed recall performance (items remembered for longer). This latter finding appears to be linked to the importance of the information to be recalled. Qualitative differences between ways in which verbal material is processed at different times of day have also been suggested in terms of the sound and meaning that is attended to. Morning processing of information appears to focus on the sound of words (phonetic processing) while in the afternoon and evening processing attention appears to focus largely on the meaning of the material (semantic processing) whereby the meaningfulness of material is better recalled following afternoon or evening presentation. By this token, performance (e.g. recall) can be interfered with by unnecessary sound during presentation early in the day and by confusing, contradictory or conflicting information that has to be processed meaningfully later in the day. It appears that rote learning or what has been termed 'maintenance processing' is the main strategy for remembering material in the morning. In this case memory for less important information seems to be superior to that for more meaningful information early in the day. Conversely, more semantic or 'elaborative' processing strategies are used to remember information later in the day leading to better recall of meaningful material.

There is some evidence that the recall of audio-visual presentation of material can be poorer when presented late afternoon (e.g. 5.30) compared to earlier in the day. However, the comprehension of information listened to, mathematical learning and non-verbal reasoning tend to be superior in terms levels of retention and understanding following learning in the afternoon compared to learning in the morning. Trying to learn material in the early hours (e.g. 4am) results in much poorer memory over the medium term (e.g. a month) compared to learning the material at, say, 8.30pm. That is to

say, much more is forgotten following attempts to retain information at non-normal times (such as when people revise for exams) compared to more normal times of day.

Poorer performing school students who received reading improvement instructions in the afternoon have been reported to show improvements in performance compared to those who received instruction in the morning (linked to the issue of better use of meaningful material later in the day). Some have even found better student performance when being taught at the teacher's preferred time of day.

Timing and the split brain

The two halves of the brain and the 90-100 minute basic rests-activity cycle are also implicated in time of day effects on visual-spatial and verbal-decision-making performance.

Although not absolute, each of the hemispheres (cerebral cortex) of the brain have been identified as being more attuned to particular mental capabilities and the processing of particular types of information. The left part of the brain is associated with verbal-linguistic, analytical and logical processes while the right hemisphere is associated with visual-spatial, holistic, non-logical processes. Research using visual-spatial (right brain) and verbal-reasoning (left-brain) tasks has concluded that there is alternating activation of the two hemispheres that cycle roughly every 90 to 100 minutes. It showed that starting from 9am there was an increase in processing verbal material up to about 10.30am with a corresponding decrease in handling visual-spatial information over this period. The pattern then changes with visual material processing improving to peak nearly two hours later with a concurrent decrease in verbal processing effectiveness over the same time. This was followed by an upsurge in verbal performance over the next couple of hours to around 3pm with the converse decrease for the visual-spatial processing. Later research suggested the morning to be most conducive to 'left-brain' tasks (involving phonic, verbal reasoning or spelling work).

Implications

In summary, the processes are complex and many factors will influence the response to presented material at a conference or the performance on a task (perhaps remembering important information, or *making* an effective presentation at a business meeting). It is only under strictly controlled laboratory conditions that the intricacies of these effects can be teased-out and understood. However, the implications of the preceding section for business settings are that we should be aware that the time of day at which we engage in a particular type of activity can influence the efficacy of the outcome. Some materials might be best presented earlier in the day while other material might work better later, or there might be alternating presentation of visual and verbal information at conferences. It is noteworthy that not only will the upsurge in sleepiness in the post-lunch period have an impact on effectiveness, but so too will the effects of an alcoholic drink at lunchtime overlay an extra negative influence on performance of a delegate or meeting attendee. Awareness of dips in efficacy could also inform the timing of more stimulating activities at meetings. Therefore, in addition to the broader knowledge about 24-hour rhythms, and cycles of sleepiness, at least some of the underlying principles of time of day effects could inform the content and structuring of events like conferences and work.

Individual Differences based on rhythms - Are you an EEE or PMP?

Research background

As noted above, there is good evidence that what we do, how we learn and how we perform tasks can fluctuate according to the time of day at which an activity is carried out. The picture is further complicated, however, because of differences between people in terms of their tendency to be more or less oriented towards early or late activity during the day. It has long been known that humans vary in their preference for the timing of their rising and going to bed, as well as their ability to perform certain tasks during the day. That is, people demonstrate preferences for the time of day in which they would engage in given activities, e.g. get up in the morning, learn information, take exercise, sit an exam, socialise, go to bed at night, and so on.

Peaks and troughs

These preferences are based on the fact that there are differences between people in when circadian rhythms peak during the day. For example, temperature is a common marker for circadian rhythms. On average, it rises through the day to peak around 8pm after which time it gradually decreases through the night to reach its lowest point at around 4am to 5am. It is often this minimum level that is noted by researchers. Body temperature then begins to rise again gradually through the day and so the 24-hour cycle is repeated day-in-day-out. However, for some people the temperature rhythm reaches its minimum relatively earlier in the day, e.g. around 4am compared to 6am for others. There can be as much as 2 hour's difference between people in the timing of temperature rhythm peaks and troughs. These differences are robust and have been shown for a range of bodily processes such as hormone secretion, and in terms of sleepiness or alertness.

The preferences shown for particular activities earlier or later in the day are a behavioural and psychological reflection of the underlying biological rhythms. Those whose rhythms tend to peak relatively early (advanced) in the day have been termed Morning-types (M-types) or 'Larks' while those with later (delayed) peaking rhythms are called Evening-types (E-types) or 'Owls'. Morning types show greater bodily activation in the morning (e.g. earlier rise in temperature, earlier secretion of hormones like cortisol - readying the system for activity) and Morning-types find it harder to stay awake beyond their normal bedtime, while activation is higher later in the day for Evening types.

One reason for the congruence between time-type and performance at their optimal period in the day is that Morning types go to sleep when their temperature is dropping, sleep drive is maximal, alertness is at a minimum and awakening at a reasonable time after the lowest point in their body temperature rhythm, i.e. their body systems are much more warmed-up, 'in-gear' and ready for activity. Evening-types, on the other hand, are impelled to rise much closer to their temperature minimum when sleep drive is higher and alertness is lower, and thus have had less time for the body and brain to prepare for the day.

Research has identified a range of differences between morning- and evening-types, or associations between morningness and eveningness and people's behaviour or characteristics. In terms of health, morningness-eveningness has been linked to mental well-being issues. When there is sleep disorder morningness has been associated with difficulty maintaining sleep and returning to sleep in the early hours, while eveningness is associated with difficulty getting to sleep in the first place and greater morning sleepiness. Eveningness has been linked with some depressive illness and poorer mood. Even differences in birth season have been noted with morning-types tending to be born Autumn/Winter and evening-types born in Spring/Summer.

Recall the idea of the parts of the brain being a little more specialised in processing or managing certain types of information noted in the previous section. Morning-types have been shown to score higher on a measure of left-brain activity (verbal, logical etc) compared to evening types. While the latter scored higher on right-brain thinking compared to morning types.

Evening-types feel it more

Evening-types tend to show a greater need for sleep, spend less time in bed during the week and more time in bed at weekends, probably as a result of building a greater sleep debt over the week. This is a consequence of both their later bedtimes and the later time at which their body rhythms tend to peak. They also report later bedtimes and waking/rising times (especially at weekends) and more irregular sleep-wake habits. Adolescent evening-types have been reported to show poorer academic performance and more difficult interpersonal relationships with peers, family and teachers.

In general, evening-type behaviour includes greater consumption of alcohol, nicotine and caffeine (all of which can contribute to poorer sleep in one way or another). They indicate the need for more sleep but tend to get less during the week despite having a tendency to make greater use of naps during the day. Evening types have also reported their sleep to be of lower quality than morning types. The greater daytime sleepiness exhibited by 'Owls' (evening-types) is likely to be associated with the early start to daytime activities common in our society, that conflicts with their natural circadian (24-hour) rhythm. Some researchers have coined the term "social jetlag" to describe the effects that this misalignment of the natural rhythms and socially imposed timetables has upon evening-types.

But it is not all body clock driven, some recent research has suggested that not only does the timing of a person's rhythms (the time that different rhythms peak) determine their morning or evening orientation, but what is called 'sleep pressure' also has a part to play. For example, people may have similar timings of the peaks in their rhythms but display morning-type characteristics because of a relatively earlier build up of 'pressure' to sleep through the day and a more rapid dissipation of sleep pressure following sleep than those characterised as evening types.

Recent evidence has emerged suggesting that the morningness-eveningness trait has a genetic basis. For example, family studies have shown that if a parent is a strong morning or evening type, then there is a high likelihood that sons or daughters will express this characteristic. That is, inheritability appears to be quite high. Other researchers have identified 'clock' genes linked to biological rhythms and have also found an association between extreme diurnal preference (that is preference for activities and rest relatively earlier or later in the day) and what have been termed 'Period' genes.

While the research into owls and larks is extensive, it is perhaps hard to believe that no one has sought to apply this knowledge to business settings to any great extent. We know from the body of research the effects are significant and that owls and larks need different things in life, but these differences are not accommodated for in the business world.

Implications

This is a key area for exploration with regard to business events and in light of the knowledge we have about the tendency toward an early-day orientation for some and a later-day orientation for others, we could think of people as being one of the following - either an Early-Eager Employee (EEE) or PM Professional (PMP). These are typified by the following:

Early-Eager Employee (EEE)

EEEs are morning people and wake quickly once the alarm has gone off. Getting up extra early to attend a meeting or conference is not a problem for them – not that they wouldn't prefer an extra hour in bed on occasion, but in general they don't tend to stay in bed longer than necessary in the morning. They are likely to prefer to deliver a business presentation between 9.30am and 11am, and recognise that they can get a little sleepy after lunchtime. As the evening wears on into night they tend to find themselves much sleepier and wanting to get to bed earlier, certainly before midnight, compared to some colleagues and friends.

If they are attending a conference it should be fairly straightforward since they tend to start early and finish earlier than the average working day. They should choose morning workshops if there is an option, and focus on networking only after 3pm. It is important for EEEs to try to ensure good sleep by not being tempted to stay up too late socialising and keep alcohol and caffeine intake to a minimum, especially closer to bedtime.

PM Professional

Getting out of bed and making it into the office for 9am every morning can be difficult and demanding, and PM Professionals are often still a little sleepy when they arrive. It takes real effort to be up and running early on in work and often PM Professionals really don't start being productive until about 10am or after, and they can find it irritating when people fire questions at them, or want them to deal with something when they first get in to the office. They seem to feel sleepier than many colleagues through the day but as the day wears on they start coming into their own and can feel brighter as the evening progresses.

Conferences and meetings can be difficult for them, especially if they have to get up really early to travel a long distance and there are early starts to sessions. PM Professionals should see if they can stay-over the night before to achieve as much sleep as possible and take a walk in the fresh air in a mid morning break to keep alert. If the conference has workshops in the morning and the afternoon they should opt for the latter, and try and do some networking in the morning. They tend to be good at staying-up late to socialise but should try to moderate alcohol intake, especially closer to bedtime. It will be helpful for them to try to get to bed a little earlier than they might normally, to help with getting enough sleep. PM Professionals are fine drinking coffee during the day, especially in the morning to help with alertness, but should go decaffeinated during the evening, or stop drinking coffee at least four or five hours before bedtime. If not they may struggle to sleep, which means things could be difficult when they return from a conference and get back to the office.

In summary, Early-Eager Employees demonstrate their underlying biology by being earlier to bed and earlier to rise, show relatively earlier rhythm peaks and preferences for early-day activity/behaviour. In relation to work or a conference, this means that morning-type people would be more in tune with an earlier start to proceedings, possibly in terms of being involved in early organisation for the day. Conversely, PM Professionals have relatively later rhythm peaks, tend to go to bed later and are later to rise in the morning. They have a preference for late-day/night-time activity/behaviour, often socialising, which to some extent explains the higher intake of alcohol. Some guidance for PM Professionals might relate to the use of alcohol and caffeine to moderate alertness and sleepiness. In general, however, those who are stronger PM Professionals will tend to suffer a greater day-to-day sleep debt and be most drowsy during the day at a conference. This might feed-in to notions of initial advice on good sleep habits but also the introduction of stimulating activity to counter evening-type sleepiness. Finally, a radical approach to organising conference events can be suggested, whereby organisers double-up on activities and arrange sessions for Early-Eager Employees early in the day, and sessions for PM Professionals later in the day.

Recommendations

While the ideas discussed are not unequivocal (as with many theories), there is enough weight of evidence to acknowledge their impact on how we function. Below I suggest what this information about the psychology of human rhythms might mean in the business environment and offer advice for improving productivity in both office and conference settings.

Implications for conference organisers

1. Understand the true power of psychological rhythms

Take people's natural rhythms - and differences - seriously. The biggest and possibly most significant change you could make is to buck the trend for starting your conference between 8.30 - 9.00am and start it at 10am. This will allow Early-Eager Employees to be firing on all cylinders while PM Professionals will have had more time for their systems to reach a higher level of readiness.

You might think you are losing an hour from an already busy schedule, but the difference and impact on concentration and productivity you will make could be substantial.

2. Respect the rhythms

If you are unable to start your conference later in the day, or in addition to maximise effectiveness, stagger activities to accommodate the different needs for Early-Eager Employees and PM Professionals. Choice is key here. Offer an early-bird workshop before the main conference begins and repeat it at the end of the day. Allow Early-Eager Employees to finish around 3pm and then move on to networking, while PM Professionals finish later and start their networking in the late afternoon/early evening.

3. Maximise your main message

If you are not able to offer a choice of sessions and need to make one of your presentations have the maximum impact for both types of delegate deliver it at 11am. This is the optimum time of day if you have just one chance to communicate with all delegates – Early-Eager Employees will still be very alert after their productive morning, while PM Professionals will be fully awake and be strong at concentrating.

4. Get physical

Introduce physical activities into the schedule for the day, as they alert the mind. Consider having a walking discussion group mid morning and mid afternoon.

4. A breath of fresh air

Consider a rural location for your conference to encourage delegates to take breaks in the fresh air - and give them the refreshing country air they might not normally have the chance to enjoy. If holding your event in the summer consider having a session outside with the stunning rural backdrop, to wake people up through the change of location and fresh air.

6. Deal with the worst the time of the day

It is widely accepted by researchers that humans suffer a dip in alertness between 1 and 5pm. While most business people put this down to eating lunch, it is in fact due to our internal rhythms. This is likely to be at its worst between 2 and 4pm.

During this time delegates could be involved in some team building exercises. These are likely to be at least partly physical, require moving about and would also benefit from being in a different room or outside, both of which will further help with alertness.

7. Consider an unusual venue

An interesting and stimulating environment will help delegates stay focused by encouraging them to explore the venues during breaks, thus encouraging them to be active and help break the daydream cycle. Unusual venues also often provide the option of exciting team building activities, which again can help get people active and be more productive in plenary sessions.

8. Day dream dangers

It has been shown people fall into cycles of day dreaming around 90 minutes long. To try and avoid this keep sessions to a maximum of 90 minutes and then give people a break – preferably an active one – to try and avoid time being wasted with delegates minds wandering.

9. Pre-presentation preparation

It has been shown that the mood people have first thing in the morning is often the mood people stay in all day, and is stronger than what happens to them once they reach their destination (such as the office or a conference). It is therefore vital to think about the experience your delegates will have first thing in the morning. Is the travel time reasonable and easily accessible by public transport so they can relax on the train? If they are staying in a hotel is it of a high quality and is the breakfast good? Can you check out the quality of the hotel and breakfasts personally to ensure they are high quality?

10. Support sleep

A good night's sleep is of crucial importance to help delegates or meeting attendees get the most of the event and help them be ready to be productive. Consider holding your event at a hotel, or linking up with one, to offer delegates a cost-effective option to stay over the night before.

11. Hotel help

If you run a hotel where delegates may be staying consider the following to help them get a good night's sleep:

- Occasional loud or sharp sudden noises can disturb sleep even if a person is not fully awakened and cannot remember it in the morning – so look at good sound insulation and keep rooms away from bar areas if possible.
- Invest in light-blocking curtains to ensure delegates can sleep in complete darkness.
- Keep rooms cool as excessively warm rooms disturb sleep
- Do not put any ticking clocks in the bedroom as this can interfere with falling asleep

Implications for conference delegates

1. Day dream believer

Try to be aware of your daydreaming cycle, which is likely to be around 90 minutes long, i.e. you are likely to start daydreaming around 90 minutes from when you get going in the morning, and this tendency can repeat throughout the day. Try and wake yourself up every 90 minutes by drinking coffee, walking around, talking with colleagues or getting some fresh air.

2. Sensible Sleep

Research has show we often don't get as much sleep as we think we do (at least not of a high quality), and a good night's rest is essential if you are going to get the most out of your conference or meeting - or indeed regular working day. Ensure you have a dark and quiet room in which to sleep (or use a mask and ear plugs), avoid caffeine four hours before you go to bed, ensure your bed is comfortable and consider getting rid of a ticking clock if you have one.

3. Don't fight your rhythm

To find out whether you are an Early-Eager Employee or PM Professional (visit www.venueyorkshire.com to take part in the eight-point test).

If you are an Early-Eager Employee

You are better in the earlier part of the day, so if there are any options to take workshops in the morning opt for those, and try to stick to just networking after 3pm. Find out if there is an early registration so you can start meeting other delegates first thing and pay particular attention to the afternoon dip in alertness and concentration levels. Think about taking a walk outside if you get chance to have an afternoon break and definitely avoid alcohol at lunchtime as this will make the afternoon a real struggle for you.

If you are a PM Professional

Early starts are tough for you, so think about staying in a nearby hotel the night before a conference so you don't have to get up too early. Take advantage of any opportunities for late registration and consider a good strong coffee to get you going. If there are any opportunities to, then opt for post-event workshops and networking will come most easily to you in the late afternoon or early evening.

Implications for public speakers

1. Morning Matters

It has been shown that information which focuses on tone, style and visual presentation can be more effective if presented in the morning. This is relevant to all conferences, particularly political conferences, where speeches are often thought of in terms of tone and strength, and the visual positioning of the politician. Ideally this should be at around 11am to ensure all of the audience, whether they be Early-Eager Employees or PM Professionals, are suitably attentive.

2. Quiet Please

Work with conference organisers to ensure you won't have to contend with any background noise, to make sure your information can be effectively processed in the minds of delegates, especially in the morning.

3. Verbal vs Visual

To help your audience concentrate on a long speech or presentation you are making try alternating visual and verbal material. Consider walking around the stage and alternating verbal information with videos and images.

4. Be aware of day dreaming

People have day dreaming cycles around 90 minutes long, from roughly when they get up in the morning. If you are making a long presentation be aware concentration is likely to start to wane after an hour, so try and keep it to just over 60 minutes if you can.

5. Respect the power of psychological rhythms

Be aware of the impact of human rhythms and the two broad types of audience members you could be faced with - Early Eager Employees and PM Professionals. If you are speaking before 10.30am keep it lively to help the PM Professionals, and likewise if you are speaking after 4pm for the Early-Eager Employees. If you are faced with the hard slot of 2-3pm pull out all the stops to make it have impact and keep it concise.

Concluding Comments

In examining the relevant literature for this review, one thing has become abundantly clear, and that is - no one has given much, if any, attention to when or what is asked of people in relation to time of day and human rhythms, especially in naturalistic learning or information-gathering and presenting situations, such as business events. Looking at the existing body of knowledge and research, I have suggested what this might mean for delegates, public speakers and conference organisers and made initial recommendations. Since these are new theories in this context they still need to be carried through and evaluated, but I hope this report will at least start some discussion on these issues.

What we can say for sure is that we should encourage better sleep, should listen to our rhythms more and consider positively the differences between people. Hopefully, this report offers a first step in understanding how to help business people get more from their working day and professional activities.

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