

TIME MEETS CRIME: A SEARCH FOR A COMMON THEORETICAL FRAMEWORK

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A cognitive approach has not only increased our understanding of the complex issue of time but has also influenced several applied fields. This paper explores whether its influences have been felt in the field of criminality. Richelle (1992) has suggested that cognitive time psychologists have not as yet accepted the challenge to apply temporal theories to the issue of criminality, a view that is supported in this paper. However, it is argued that a rational choice theory with emphases on planning may be the integrating factor that will allow us to accept challenge this.

Although recognised by scientists and historians alike as being a fundamental concept, our "window on the world" which allows us to respond to as well as create order and to shape the kind of world we live in (Rifkin, 1987), time still remains a difficult concept to define. In the west, we live in a highly time-conscious culture which customarily measures time in seconds, minutes and hours. Our behaviour is frequently geared to the mechanical clock with bizarre precision so that to produce 230 axle housings per day, the drill-reaming operator is supposed to take 2.059 minutes, the profile-miller operator 1.884 minutes, and so on (Young, 1988, p. 45). Or, to pull a successful bank robbery, criminals have to make a whole range of very explicit decisions: for example, which day is most opportune; the exact time they should enter the bank; precisely how long each particular step in the procedure should take; and even the length of time they should wait before spending any of the stolen money. The importance of precision in external time is also well understood by crime novelists and is used not only to emphasise a well-planned mission, but also to build up suspense in the reader.

'Entering Cherryhayes fifteen seconds,' muttered the van's co-driver.
'Slow down, thirty seconds to go,' replied Lyndhurst. Twenty seconds later he said, 'Enter the Close now.'

Round the corner came the van, quite slowly, on side lights. 'Eight seconds,' murmured Lyndhurst into the receiver, then a savage whisper to Preston: 'Dial now.' (*The Fourth Protocol*, Frederick Forsyth, p. 502)

In spite of this apparent obsession with objective time in both fact and fiction, in our everyday experience of time perhaps the most remarkable, yet curious fact is that time will often seem to fly and, at other times, to drag intolerably. An enjoyable play seems to be over in minutes while, for the incarcerated man, time crawls - years inside seem aeons longer than years outside enjoyed in normal activities (Goffman, 1961). Such temporal phenomena have long intrigued time psychologists. Indeed the first century of experimental time psychology is one which focused almost entirely on the psychophysics of duration: the subjective flow of time being analysed under an almost infinite number of experimental conditions. It still remains a topic of interest today though now the theoretical paradigm guiding much of our research is that of cognitive psychology. Within such an approach, two different temporal modes have been distinguished, an implicit mode which involves the direct tuning of human action to the dynamics of the surrounding world and a second explicit, reflective mode which deals with time viewed as past, future, order or duration. Taken together these two modes, the implicit and explicit, allow humans to deal successfully with all aspects of the complex temporal environment within which we live (Jackson, 1989; Michon, 1988, 1989).

Adopting a cognitive approach to time has resulted in a significant increase in our understanding of the complex issue of time. This approach has not only been theoretical but has also made itself felt in relation to more applied issues such as robotics; time management and budgeting; and the high levels of planning required in for example, the scheduling of hospital duty rosters (e.g., Jackson, Akyürek & Michon, 1993). The question we would now like to address is whether or not a cognitive approach to time has had any influence on theories of criminality.

As the following example will illustrate, crime novelists have certainly been aware of the influence of time and temporal processes such as subjective perceptions of duration:

'How many hours did we stagger and lurch after the tractor like drunk or dying men - six hours, eight, ten? We didn't know, we shall never know. Time as an independent system of measurement ceased to

exist: each second was an interminable unit of suffering, of freezing, of exhausted marching, each minute an aeon where the fire in our aching leg muscles fought with the ice-cold misery of hands and feet and faces for domination in our minds, each hour an eternity which we knew could never end.' (*Night without End*, Alistair Maclean, p.182)

Popular belief also accords a prominent position to temporal aspects in crime by accepting the view that "*Idle hands are the devil's workshop*" (cited in Gottfredson & Hirschi, 1990), in other words, the more time one has available for criminal activities, the more one engages in them. However, given the simplicity of the argument which ignores the potential mediating role played by other nontemporal variables such as personality characteristics or group influences, it is not surprising that empirical investigations of the relationship between unemployment and crime have produced inconclusive results (Gottfredson & Hirschi, 1990; Wilson & Herrnstein, 1985). Behavioural scientists exploring sexual murders have characterised two types of killer by their modus operandi, namely organised or disorganised murderers, with the former explicitly planning both their attack and disposal of the victim and the latter reacting haphazardly without any explicit script (McCann, 1992). Police investigations have also revealed significant patterns in criminal planning in relation to domestic burglary (e.g., Korthals Altes & Van Soomeren, 1990). This eclectic array of examples has been given simply to underline the need for temporal factors to be incorporated in theories of criminal behaviour. That this need exists should not be surprising. To return to Rifkin (1987), criminals as well as non-criminals need the concept of "time" to allow them to respond to as well as create order and to shape the kind of world they live in. As cognitive psychologists we need to explore whether or not the representations criminals develop to cope with the sequential/temporal structure of the world differ from those of non-criminals. How have we fared?

A search of the literature shows that one aspect of time in delinquents, that of temporal perception, did lead to quite a bit of research in the 60's and 70's (reviewed in De Volder, 1979; Winnubst, 1975). Most of the research was related to one of two topics: firstly, time perspective studies in which the range of a person's future planning was studied. The basic hypothesis that was tested in much of this research was that delinquents have a shorter time perspective than non-delinquents, that is, they look less far ahead in the future. The second topic related to studies involving the estimation of short time intervals,

the results of which were taken as an indication of the speed of the internal clock. Siegman (1961) was one of the first to study simultaneously both time perspective and time estimation of delinquents. In the time perspective task, subjects were asked to say what age they thought they would be when each of ten self-selected events would occur. The time estimation task involved judging the durations of three time intervals: 5, 15 and 25 secs. The actual method used to make estimations is unfortunately not clear from the article. The rationale behind the experiment was the following: the range of a person's future perspective is a significant source of variance in the experience of duration. More specifically, the longer the range of one's future time perspective, the faster one's internal clock. Siegman based his hypothesis on the following assumptions: the more the subject desires that an interval of time pass rapidly, the longer it will appear to be, and subjects with a long range future time perspective are relatively more motivated that time pass rapidly. In relation to delinquency, his hypothesis was that a delinquent group would have a shorter future planning and a slower internal clock than non-delinquents. While his empirical results supported his hypothesis, these findings were not always replicated, even by himself (Siegman, 1966). For example, in studies which compared inmates with institutionalized normal subjects, Black and Gregson (1973) found that normals were more future oriented than recidivist delinquents. However, these same researchers found no significant difference between normals and first sentence prisoners as to future orientation. Landau (1976) found no significant differences in time orientation either between institutionalized delinquents and soldiers, or between delinquents on probation and students. As with the controls, delinquents were more oriented to the future than to the present or past. The data in relation to time orientation therefore remains indecisive, conflicting and somewhat out of date. Unfortunately, current researchers in either the time or crime domain have not as yet addressed these important issues further.

Siegman's finding in relation to a slower internal clock for delinquents was also controversial in that it contradicted many of the theoretical and empirical approaches to the delinquent that were current at that time. Such theories viewed the delinquent as having an impulsive and impatient personality with an inability to defer gratification (see Walters, 1990 for review). Logically, one would expect the internal clock of an impulsive person to be *faster* than that of a more relaxed

and patient person. Later studies (e.g., Howenstine, 1969; Siegman, 1966) did in fact find that the internal clock of delinquents was faster than that of non-delinquents. An important problem with these early studies has been put forward by Macar (personal communication). She suggests that the contradiction between Siegman's ideas and the theories stressing the delinquents' impulsivity may actually result from a misunderstanding about the relationship between the internal clock and the actual task which has to be performed. A faster clock should indeed induce shorter production durations (i.e., underestimations) in tasks where subjects have to time the duration of a motor response or wait for a to-be-estimated delay before giving a response (this may in turn correspond to impulsivity) but longer estimates of the duration of external signals (overestimation in perceptual tasks). Bearing these data in mind, it seems possible to assume that a delinquent having a faster clock (and therefore being impulsive) will feel the external events pass by too slowly and that the future is too far away to anticipate, and consequently will have a shorter future planning. This would contradict Siegman's hypothesis but would reconcile his findings with those related to impulsivity.

These comments underline the fact that we do not have enough studies available to make any firm conclusions about the relationship between the rate of the internal clock and delinquency. Similarly inconsistent results are also to be found in studies exploring the delay of gratification studies. While Mischel (1961) and Mischel and Gilligan (1964) found the expected relationship between delinquency and the preference for immediate rewards, the results in the study of Rosenquist and Megargee (1969) were mixed: certain groups of subjects showed differences between delinquents and non-delinquents but no differences were found between still other groups. This finding should not be surprising for contemporary researchers who are aware of the influence of individual differences in their studies. Defining a group as merely delinquent or non-delinquent must surely be too imprecise: many more subtle but important differences must exist between individuals categorised as delinquent. Further investigations around the '60s and '70s explored correlations between various sociological background variables and time perspective. The problem with this type of research is that it does not take us very much further than the level of description: Explanations and attempts to integrate diverse research findings were lacking. Have cognitive time psychologists not contributed anything to this field of research? It would appear not, or at

least very little. This viewpoint has already been presented by Richelle (1992). He suggested that cognitive time psychologists have not as yet accepted the challenge to apply temporal theories to the issue of criminality, and have so far neglected the study of time perspective or time horizon as an area of time duration. In particular, he raised a number of questions which are pertinent to the topic of this paper. Basing his arguments on the somewhat contradictory evidence we have just discussed he suggests: "..... young delinquents are known to have short time perspectives, which means emphasis on representations for events in the near future at the expense of remote future. Are such representations shaped by the social context or by individual life experience? Are they primary to socially deviant conduct, or are they by-products of a personal history that has failed to build appropriate cognitive regulations as far as time control is concerned?" (1992, p. 375).

Since little, if any, empirical research has been carried out by time psychologists to address questions such as those raised by Richelle, the question we can now ask is: Have our colleagues from other relevant disciplines fared better? Have they considered the role of temporal factors in their theories of criminality?

Theories of criminality have a long and varied history. To give the readers some basic understanding of their richness and complexity, we will attempt to provide a very brief summary of the relevant theoretical developments (for more comprehensive reviews see Vold & Bernard, 1986; Walters, 1990).

Towards the end of the 18th century, criminological theories abandoned notions of God and Satan and adopted the view that man is gifted with Free Will. In this classical view of criminology, culprits were judged to be responsible for their actions and, accordingly, the personal characteristics and circumstances of the criminal were not considered in the sentencing process. In the second half of the 19th century, biological and cultural antecedents of human behaviour became more popular, and several *positivistic* theories arose. Following on from Darwin, Lombroso contended that criminals could be distinguished from non-criminals by looking at certain bodily characteristics. He argued that criminals were more primitive than normals, i.e. they were less evolved. This biological theory has evoked much critique, and today Lombroso's theory is used as a good example of "bad science".

The 20th century heralded something of an explosion in research on criminology. However, what clearly emerges from the resulting

literature is that investigating the origins of criminal behaviour is indeed a complex task and this complexity is clearly mirrored in the diversity of theories that were expounded to explain deviant behaviour around this time. Moreover, since few of the theories were multidisciplinary in essence, we are still left with the problem of trying to integrate them in some meaningful way. As an initial step we will distinguish between three types of theory: biological, intentionalistic and functionalistic.

An example of a biological theory would be the stimulation theory which suggests that some individuals have a low level of cortical activation (Quay, 1977). To increase this level, they may seek out and engage in stimulating events: some climb mountains, some go bungee jumping, some cycle through Paris on a Saturday afternoon, while others may engage in more criminal forms of activity. In the eighties attention also shifted to hormone levels, neurotransmitters, toxic influences and dysfunctions of the nervous system as potential explanations for criminality. Though potentially interesting, the amount of data collected up until the present time is still very limited. We do not know which, if any, biological hypotheses may be useful nor why some people choose to engage in "acceptable" forms of sensation seeking while others choose more delinquent paths. Nor, unfortunately, can we at present say much about the relationship with temporal theories though neurobehavioural studies as such are being carried out for temporal judgment tasks (e.g., Macar, Vidal & Bonnet, *in press*; Hicks, 1992) may offer a potential way forward.

Let us now consider a few examples of intentionalistic theories which are theories that make reference to mental contents and human motives. In the beginning of the 20th century, Freud initiated a new way of thinking about man, namely as being healthy and neurotic, and the psychodynamic theories of criminality that arose gave a prominent role to such personality characteristics. During the fifties, sociological positivistic theories stressed the role of group influences on criminal behaviour and saw the individual as having only a limited amount of control over his/her own behaviour. For example, within a differential association theory crime is seen as being caused by the negative influences the environment has on the individual, in this case the social group the person identifies with: individuals break the rules simply because they interact and identify with people who engage in criminal or delinquent activity. Yet another direction that emerged around this time stemmed from the humanistic movement in psychology: the importance of the self-concept in the causation of crime was stressed

with labelling theory being viewed as relating criminals' negative self-concept to the mark that society places on them. Unfortunately, the examples in this intentionalistic category are difficult to test empirically and the data that do exist have great difficulty in explaining the exceptions: the members of the gang who refrain from lawbreaking. And, more importantly for our purposes, as a group these theories fail to address any temporal parameters.

How does the functionalistic category of theories fare? This group does not rely on research methods which require subjects to express their motives or intentions but instead explores the function of particular behaviour. Let us consider a number of these theories with a view to exploring whether or not they are more successful in addressing temporal parameters. One such theory, the strain theory, holds that certain individuals have fewer legal opportunities for obtaining economic rewards and, as a result, turn to more illegal means. Strain theory is disappointing in that it has produced little empirical support and the prognoses for the theory are not optimistic (Gibbons & Krohn, 1991). As a theory it therefore adds nothing to our knowledge of the role of temporal factors in criminality. Yet another functional theory that is currently still very popular is social control theory. Formulated by Hirschi (1969), it states that man must learn not to offend. In successful segments of society, individuals are to a certain extent controlled by the conventional order established by school, parents, peers etc. When a particular individual fails to bind or identify with these groups or institutions, he/she may become more attracted to a criminal lifestyle. Before discussing more current developments in the social control theory (Gottfredson & Hirschi, 1990) particularly as they relate to temporal theories, let us first consider the rational choice theory. Economists such as the Nobel Prize winner Gary Becker view crime as a rational act resulting when individuals evaluate the expected utility of both criminal and non-criminal activities and then choose the alternative with the highest net payoff (Becker, 1968). In its strongest form, such theories of normative rationality predict that potential criminals will gather information relative to the risks (e.g., being caught by the police; retaliation of victim; disapproval of onlookers and pangs of conscience) and benefits (e.g., material gain; approval of peers; and satisfying an old score) and combine this information according to the expected utility formula. Whilst introduced as an economic theory, much of the emphasis in the rational choice theory hinges on decision making processes. Moreover, since decision

making is one of the areas of human information processing which is much researched by cognitive psychologists, the theory may offer a logical starting point for cognitive psychologists to begin considering an integration between criminological and temporal theories. This suggestion gains support from the fact that it is within such a category of theories that criminologists have paid most explicit attention to temporal factors. For example, in the accounting that has to go on when benefits are weighed against negative consequences, the need for immediate satisfaction as opposed to the delay of gratification must play a role. As we have already discussed, results from earlier research which explored the hypothesis that non-delinquents have the capacity to refrain from immediate wish fulfillment whilst criminals are more inclined to prefer more immediate wish fulfillment have been contradictory and have led to many criticisms of the concept (e.g., Winnubst, 1975). The notion has, however, become an important one again and the factor of time is beginning to gain a significant role in current research. For example, in their view of the origins of criminal behaviour, Wilson & Herrnstein (1985) basically adopt an operant conditioning standpoint (Skinner, 1958) which suggests that behaviour is controlled by its consequences (reinforcers and punishers) and that these consequences may be immediate or postponed, certain or uncertain. Moreover, they argue that there are large variations in the influence of delay and uncertainty on individual differences in criminality. In general, the value of non-crime lies in the future and is therefore more easily assimilated into the accounting by persons who can conceive of future consequences and who attach a high value to even distant consequences (e.g., not playing truant in order to get a school diploma and then, as a result of the school achievement, to get a good job; not spending money on gambling or drugs so as to save money in order to get married and get a nice house). We have already discussed the theoretical concept of self-control as proposed by Hirschi (1969). In Gottfredson & Hirschi's (1990) more recent work, an important element within the central concept of social control is the inability to defer gratification and a lack of interest in long-term planning. Therefore, as pointed out by Nagin & Paternoster (1993), in both the Wilson & Herrnstein (1985) and Gottfredson & Hirschi (1990) vision, individuals are perceived as rational decision makers who respond to perceived incentives: criminals who place less value on future consumption are unlikely to invest in a line of activity that sacrifices immediate for future gratification.

We have already described a strong form of rational choice theory but, as cognitive psychologists we feel that the decision processes implied in this economic version of the theory are inconsistent with our knowledge of the human information processing system. Research in cognitive psychology has shown that the active processing of information occurs in a serial manner within a memory system of limited capacity (we can only hold a small amount of information in an active state) and limited duration (information not actually rehearsed fades from active memory within a few seconds). The notion that information processing limitations place constraints on decision processes has been described by yet another Nobel prize winner as the concept of bounded rationality (Simon, 1957; 1979). As a consequence of limited capacity, humans are forced to rely on heuristics to keep the demands of complex problem solving within the bounds of available capacity. Reliance on such heuristics allows for efficient problem solving or decision making - but, at the cost of an increased possibility of making errors. For example, in constructing a representation of a potential criminal opportunity, the limits on a human to process information may ensure that the representations that are made only contain part of the information that is potentially available. This will be particularly evident in complex situations. Clarke & Cornish (1985) have warned of the dangers of generalising, however. They have pointed out that there is a need for specificity and that the configuration of models may vary significantly for different types of crime. While criminal planning demands decisions about the when, why, where and how of criminal activities, the models involving offenses which depend upon "presented" opportunities (e.g., shoplifting) will probably be simpler than those (e.g., residential burglary) involving opportunity that must be "sought". These in turn will be simpler than those involving offenses where opportunities are "created" or "planned" (e.g., bank robberies). In this respect, time must be viewed as adding another uncertainty to the decision making process thereby making it more complex. Some opportunities may be almost immediate as in the shoplifting example and others such as the bank robberies are well in the future. The rewards associated with these types of crime are therefore also spread out over time. Time discounting must therefore be an important factor in planning crimes and should be incorporated in models of criminality.

The integrating factor between models of time and models of criminology that is beginning to emerge therefore appears to be

related to planning. Planning is a very broad term, and defining it is not an easy task. However, it certainly refers to the human capability of reasoning about the environment and producing behaviour in order to achieve certain goals or conditions (Jackson, Akyürek & Michon, 1993). The concept of planning has to make use of explicit and implicit notions of time (Michon, 1988), and incorporates both external and subjective time. By using these concepts to examine criminal behaviour we may begin to make some progress in our attempts to answer Richelle's (1992) challenging questions. Within this context, the present paper must be viewed more as a statement of intent rather than as a progress report.

REFERENCES

- Becker, G. S. (1968). Crime and punishment: An economic approach. *Journal of Political Economy*, 76, 169-217.
- Black, W. A. M., & Gregson, R. A. M. (1973). Time perspective, purpose in life, extraversion and neuroticism in New Zealand prisoners. *British Journal of Social and Clinical Psychology*, 12, 50-60.
- Clarke, R. V., & Cornish, D. B. (1985). Modelling offenders' decisions: A framework for research and policy. In M. Tonry & N. Morris (Eds.), *Crime and justice: An annual review of research* (Vol. 6, pp. 147-185). Chicago: University of Chicago Press.
- De Volder, M. (1979). Time orientation: A review. *Psychologica Belgica*, 19, 61-79.
- Gibbons, D., & Krohn, M. (1991). *Delinquent behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Goffman, E. (1961). *The prison*. New York: Holt, Rinehart & Winston.
- Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Stanford, CA: Stanford University Press.
- Hicks, R. E. (1992). Prospective and retrospective judgments of time: A neurobehavioral analysis. In F. Macar, V. Pouthas, & W. J. Friedman (Eds.), *Time, action and cognition: Towards bridging the gap* (pp. 373-382). Dordrecht: Kluwer.
- Hirschi, T. (1969). *Causes of delinquency*. Berkeley, CA: University of California Press.
- Howenstine, R. J. (1969). Future time perspective and its relation to the effects of external stimulation and activity upon time estimation in delinquent and non-delinquent male adolescents. *Dissertation Abstracts*, 30, 848.
- Jackson, J. L. (1989). The processing of temporal information: Do we indeed time our minds?. In J. T. Fraser (Ed.), *Time and mind: Interdisciplinary issues* (pp. 43-57). Madison, CT: International Universities Press.

- Jackson, J. L., Akyürek, A., & Michon, J. A. (1993). Symbolic and other cognitive models of temporal reality. *Time & Society*, 2, 241-256.
- Korthals Altes, H. J., & Van Soomeren, P. (1990). Inbraken en inbrekers onderzocht. In T. Boot, H. J. Heyboer, & R. Meyer (Eds.), *Beveiligingsjaarboek 1990* (pp. 21-28). Arnhem: Noorduyt.
- Landau, S. F. (1976). Delinquency, institutionalization, and time orientation. *Journal of Consulting and Clinical Psychology*, 44, 745-759.
- Macar, F., Vidal, F., & Bonnet, M. (in press). Attention and brain activation in the processing of brief durations. In J.T. Fraser & S. Macey (Eds.), *Time and life*. Madison: International Universities Press.
- McCann, J. T. (1992). Criminal personality profiling in the investigation of violent crime: Recent advances and future directions. *Behavioral Sciences and the Law*, 10, 475-481.
- Michon, J. A. (1988). Guyau's idea of time: A cognitive view. In J. A. Michon, V. Pouthas, & J. L. Jackson (Eds.), *Guyau and the idea of time*. Amsterdam, The Netherlands: North-Holland.
- Michon, J. A. (1989). Timing your mind and minding your time. In J.T. Fraser (Ed.), *Time and mind: Interdisciplinary issues* (pp. 17-39). Madison, CT: International Universities Press.
- Mischel, W. (1961). Preference for delayed reinforcement and social responsibility. *Journal of Abnormal and Social Psychology*, 62, 1-7.
- Mischel, W., & Gilligan, C. (1964). Delay of gratification, motivation for the prohibited gratification, and responses to temptations. *Journal of Abnormal and Social Psychology*, 69, 411-417.
- Nagin, D. S., & Paternoster, R. (1993). Enduring individual differences and rational choice theories of crime. *Law & Society Review*, 27, 467-492.
- Quay, H. C. (1977). Psychopathic behavior: Reflections on its nature, origins, and treatment. In I. Uzgiris & F. Weizman (Eds.), *The structuring of experience*. New York: Plenum.
- Richelle, M. N. (1992). From action to cognition: Bridging the gap? In F. Macar, V. Pouthas, & W. J. Friedman (Eds.), *Time, action and cognition: Towards bridging the gap* (pp. 373-382). Dordrecht: Kluwer.
- Rosenquist, C. M., & Megargee, E. I. (1969). *Delinquency in three cultures*. Austin: University of Texas Press.
- Rifkin, J. (1987). *Time wars: The primary conflict in human history*. New York: Henry Holt & Co.
- Siegmán, A. W. (1961). The relationship between future time perspective, time estimation, and impulse control in a group of young offenders and in a control group. *Journal of Consulting Psychology*, 25, 470-475.
- Siegmán, A. W. (1966). Effects of auditory stimulation and intelligence on time estimation in delinquents and non-delinquents. *Journal of Consulting Psychology*, 30, 320-328.
- Simon, H. (1957). *Models of man: Social and rational: Mathematical essays on rational human behavior in a social setting*. New York: Wiley & Son.
- Simon, H. A. (1979). *Models of thought*. New Haven and London: Yale University Press.

- Skinner, B. F. (1958). Teaching machines. *Science*, 128, 969-977.
- Vold, G. B., & Bernard, T. J. (1986). *Theoretical criminology* (3rd ed.). New York: Oxford University Press.
- Walters, G. D. (1990). *The criminal lifestyle: Patterns of serious criminal conduct*. Newbury Park, CA: Sage.
- Wilson, J. Q., & Herrnstein, R. J. (1985). *Crime and human nature*. New York: Simon & Schuster.
- Winnubst, J. A. M. (1975). *Het Westerse tijdssyndroom: Conceptuele integratie en eerste aanzet tot construct validatie van een reeks molaire tijdsvariabelen in de psychologie*. Nijmegen: Stichting Studentenpers.
- Young, M. (1988). *The metronomic society: Natural rhythms and human timetables*. London: Thames & Hudson.

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