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# Offender mobility and distance decay: Aggregated and offender level differences

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## Research question

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- Wim Bernasco (yesterday, Env.Crim.1):
  - “One of the most important laws – scientific laws – in criminology is distance decay.”
- Is it?
  - Is DD a universal law in (environmental) criminology?
  - Is offender mobility intertwined with different distance decay patterns?
    - At the aggregate level
    - At the level of the individual offender



## Background: DD pattern

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- Most crimes are committed close to home
- Gradual decline: the chance of criminal operations is reduced when the distance increases
- Prompted by rational choice and routine activities:
  - Travelling (for crime) takes time, costs and efforts and increases risk.
  - One will merely travel if profits outweigh costs (Morselli & Royer, 2008; Snook, 2004)



## Debate

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- Many studies have observed such a pattern
  - ...be it mostly on an aggregated level
- Van Koppen & De Keijer (1997) vs. Rengert, Piquero and Jones (1999):
  - DD is / is not the result of an ecological fallacy and cannot / can be found at both the aggregate and individual level
- Smith, Bond & Townsley (2009): two thirds of JTC variation resides between offenders.
  - It is worthwhile to bring decay analysis down to the level of the individual offender



## Our research

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- Divides distance decay into its two components:
  - Near home offending: average travelled distances are small
  - Decay: there is a gradual decline in crime as distances increase
- And aims at linking decay to offender mobility.



## Method

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- Property crimes with known offenders
- Nationwide (Belgium), but only geographic information on municipality level
- 5 'mobility' features (for property crime):
  - Multiple offending (10 or more) ~ experience
  - Co-offending
  - Eastern European offenders
  - Older offenders (age 30 or more)
  - Offending of affluent target areas ~ 'rich pickings' (cfr. Mawby, 2001)

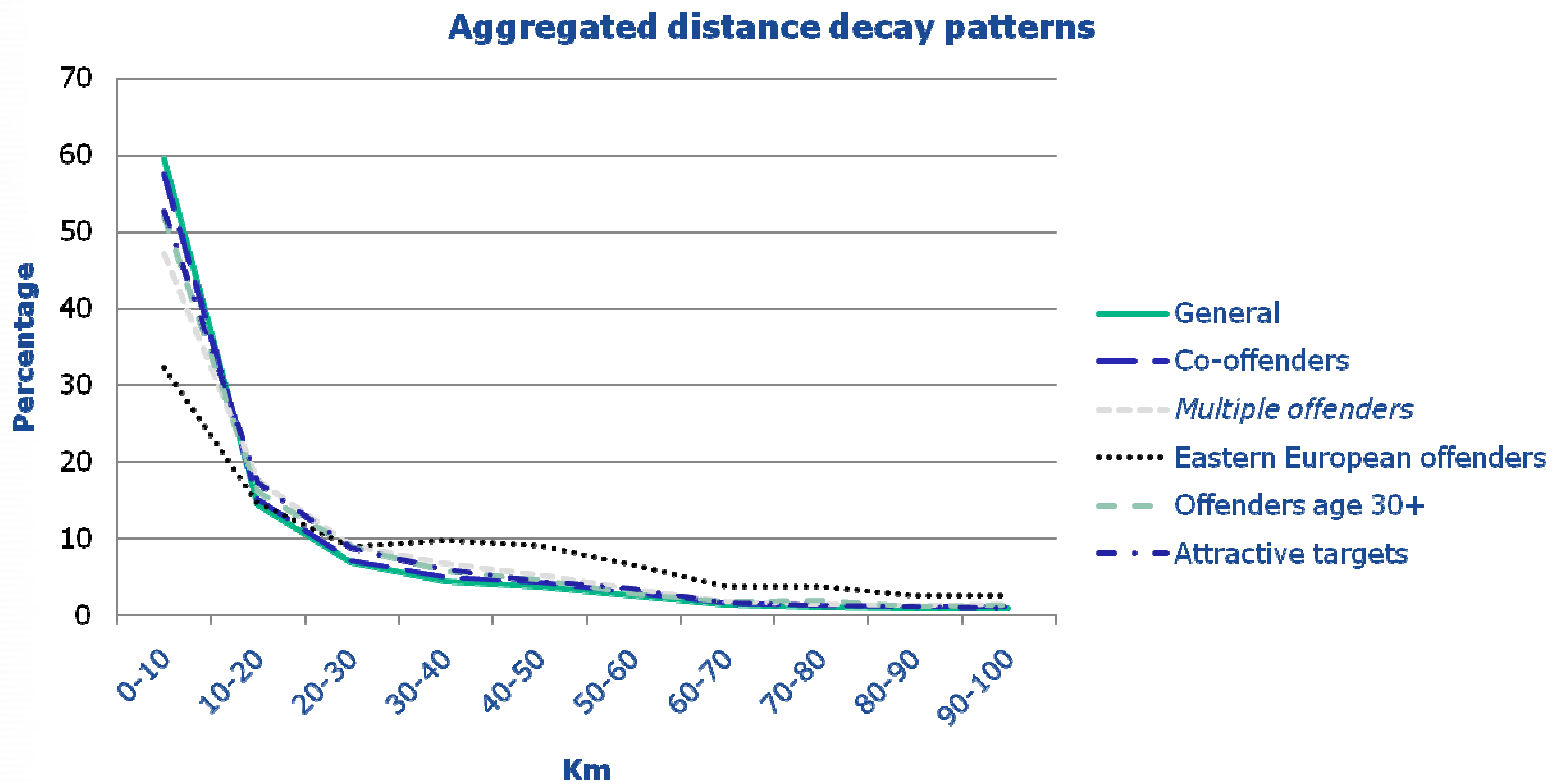


## Results (aggregated)

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- Higher mobility confirmed: mean travelled distances for these offenders were higher than for others
- Distance decay was observed for all groups, but deviated slightly for Eastern European offenders

# Results (aggregated)





## Decay at the offender level

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- Followed a method proposed by Smith et al. (2009):
  - Calculated skewness estimates and skewness z-scores for distances travelled by each individual offender
  - If right tail of distribution is longer than the left (= positive skewness) -> decay
  - Significant decay implies a skewness z score  $> 1,96$  (2 standard deviations)
- Only for multiple offenders (to overrule the law of small numbers)

## Results (individual)

	$Sz > 1,96$	$0 < Sz < 1,96$	$-1,96 < Sz < 0$	$Sz < -1,96$
All multiple offenders	49,4%	24,7%	14,1%	11,8%
Co-offenders	48,5%	26,6%	15,1%	9,5%
Eastern European	38,5%	31,1%	19,7%	10,7%
Age 30+	45,8%	25,8%	18,1%	10,3%
Attractive targets	46,0%	25,5%	16,2%	12,3%



## Results (individual)

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- For only half of the multiple offenders, a significant decay has been observed
- For every 5 offenders with significant distance decay, there is 1 with significant distance increase
- Sz is negatively correlated with mean distance ( $r=-.39$ ) -> DD is stronger for offenders who offend near home

## Conclusions

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- Larger mobility may result in different DD patterns
- DD has been observed at the aggregate level...
  - Although basic group divisions already show certain changes (e.g. Eastern European offenders)
- ... but cannot be translated straightforward into DD at the level of the individual offender
  - Many offenders show no significant DD pattern ( $Sz < 1,96$ ) or even follow a distance increase pattern ( $Sz < -1,96$ )



## Was Wim Bernasco wrong?

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- As far as I know, Wim is rarely just 'wrong'
- However, DD studies need to take into account particular issues:
  - e.g. previous residences
  - Other anchor points
- ... and is less universal on more detailed levels of analysis (different groups, individual offenders) than it is on a general level