Executive dysfunction, impulsivity and violent criminal behavior

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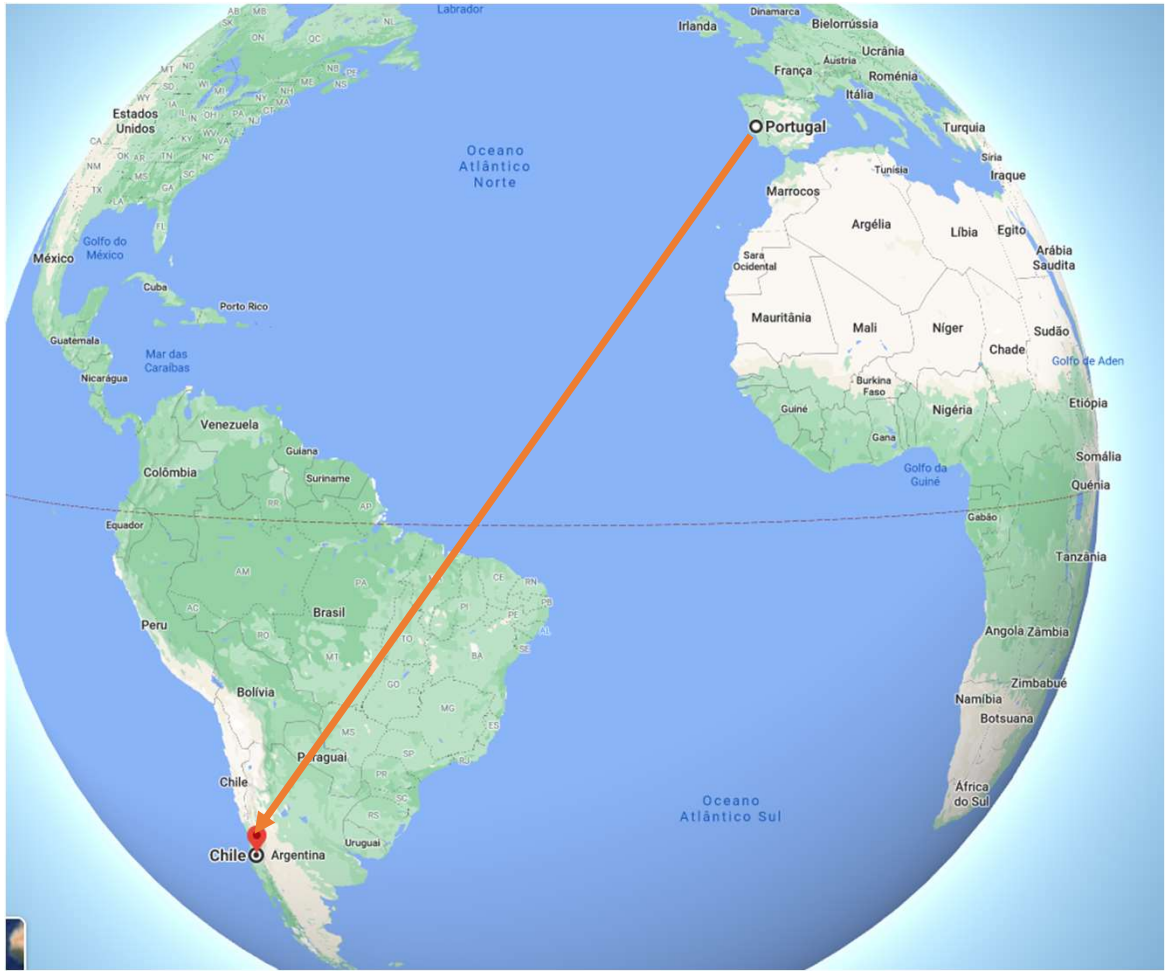

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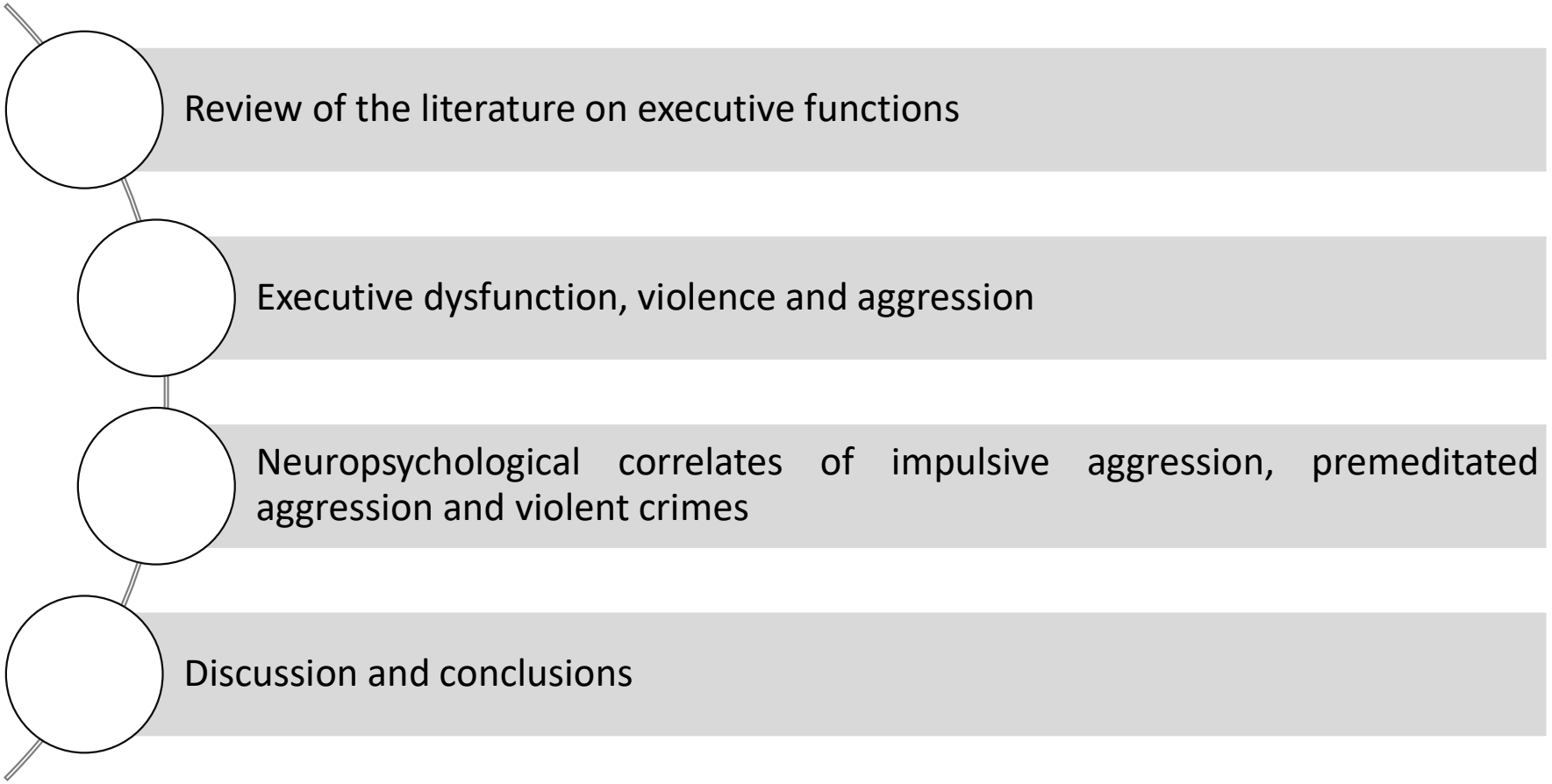
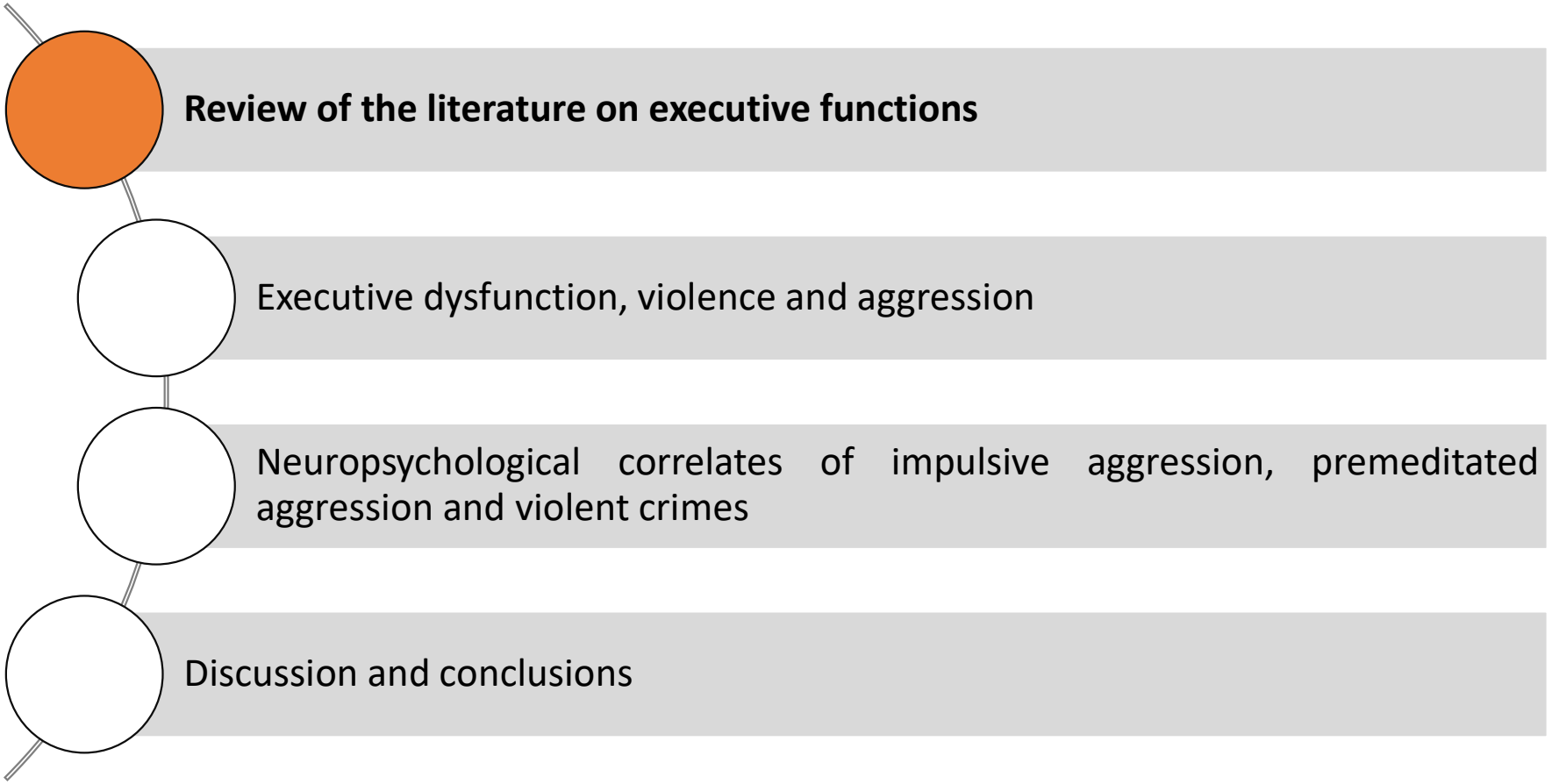
Main topics


Review of the literature on executive functions
Executive dysfunction, violence and aggression
Neuropsychological correlates of impulsive aggression, premeditated aggression and violent crimes
Discussion and conclusions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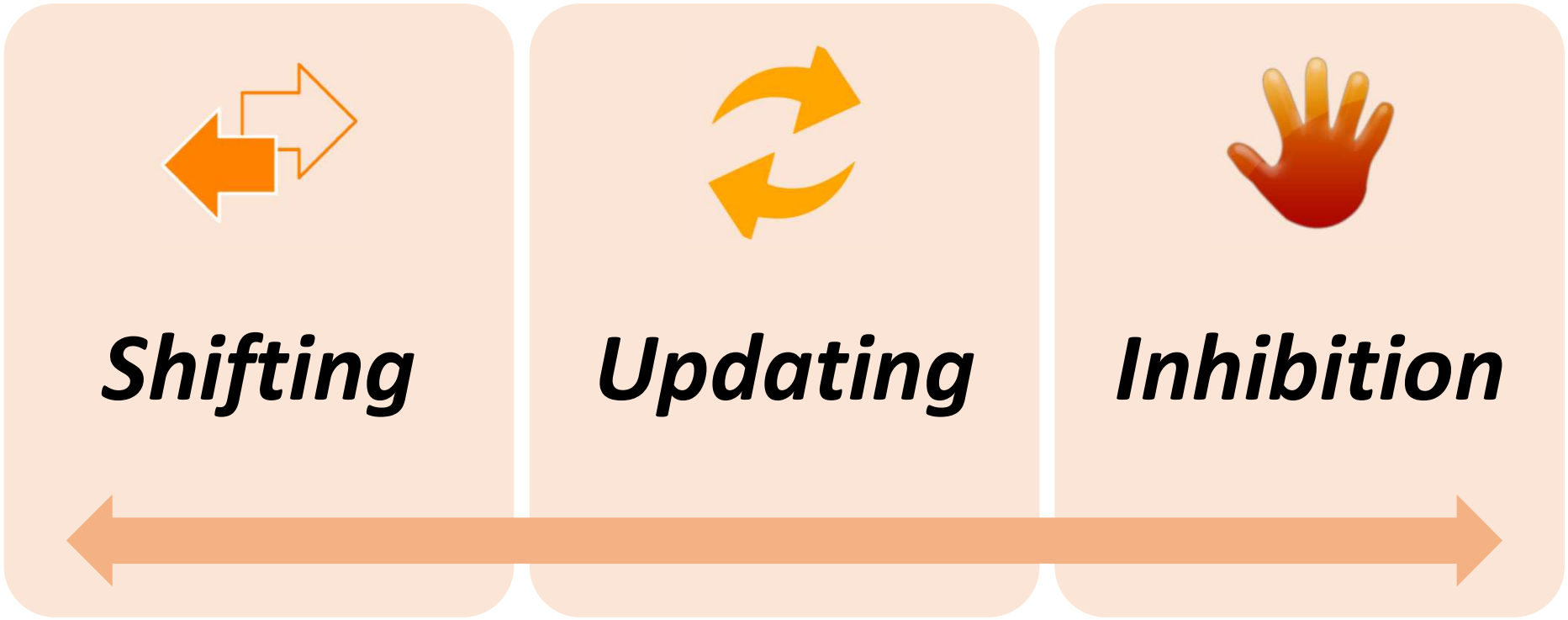
Executive functions

"Executive function" is an umbrella term for various complex cognitive processes and sub-processes:

- Modify the behaviour in the light of recent information
- Generate strategies
- Sequence complex actions

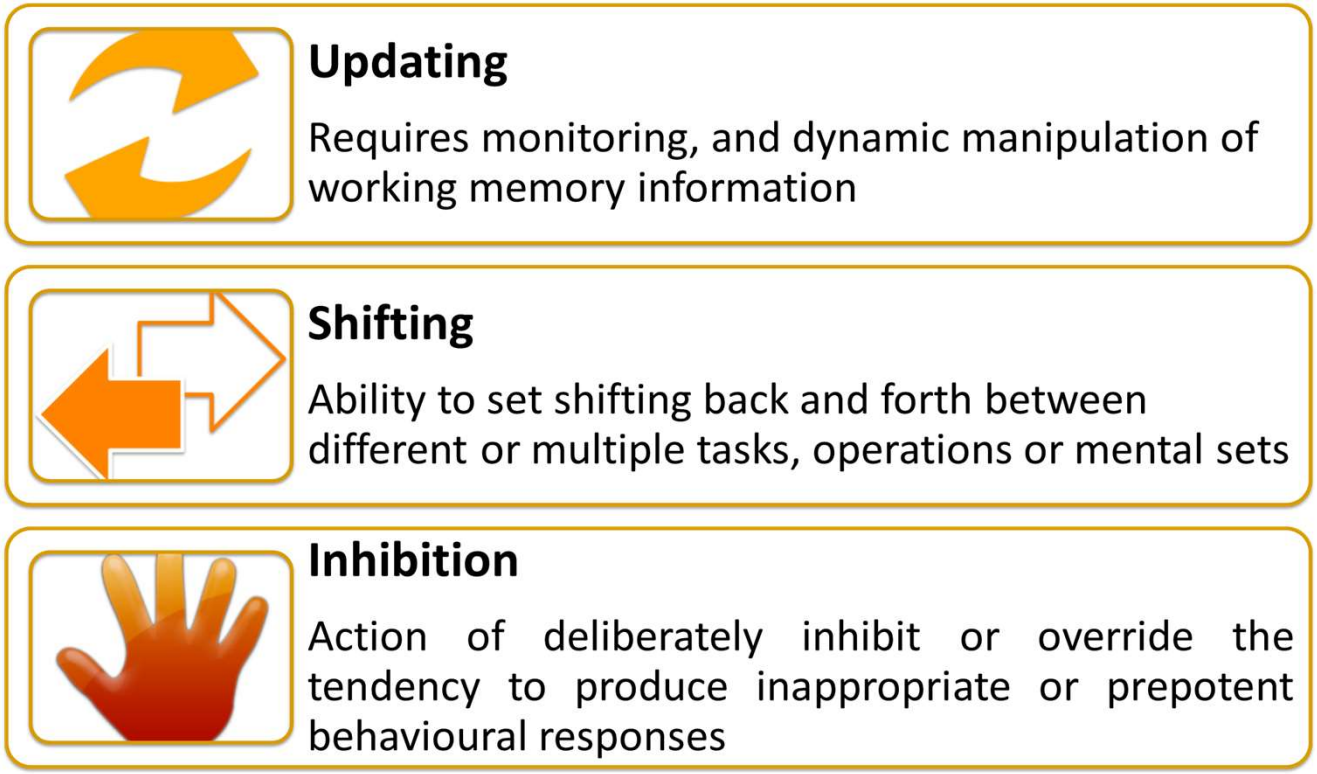
e.g., Dick & Overton, 2010; Elliott, 2003; Jurado & Rosselli, 2007; Lezak, Howieson, & Loring, 2004; Morgan & Lilienfeld, 2000; Ogivie et al., 2011; Stuss & Alexander, 2007

Executive functions



Miyake, Friedman, Emerson, Witzki, & Howerter 2000

Executive functions



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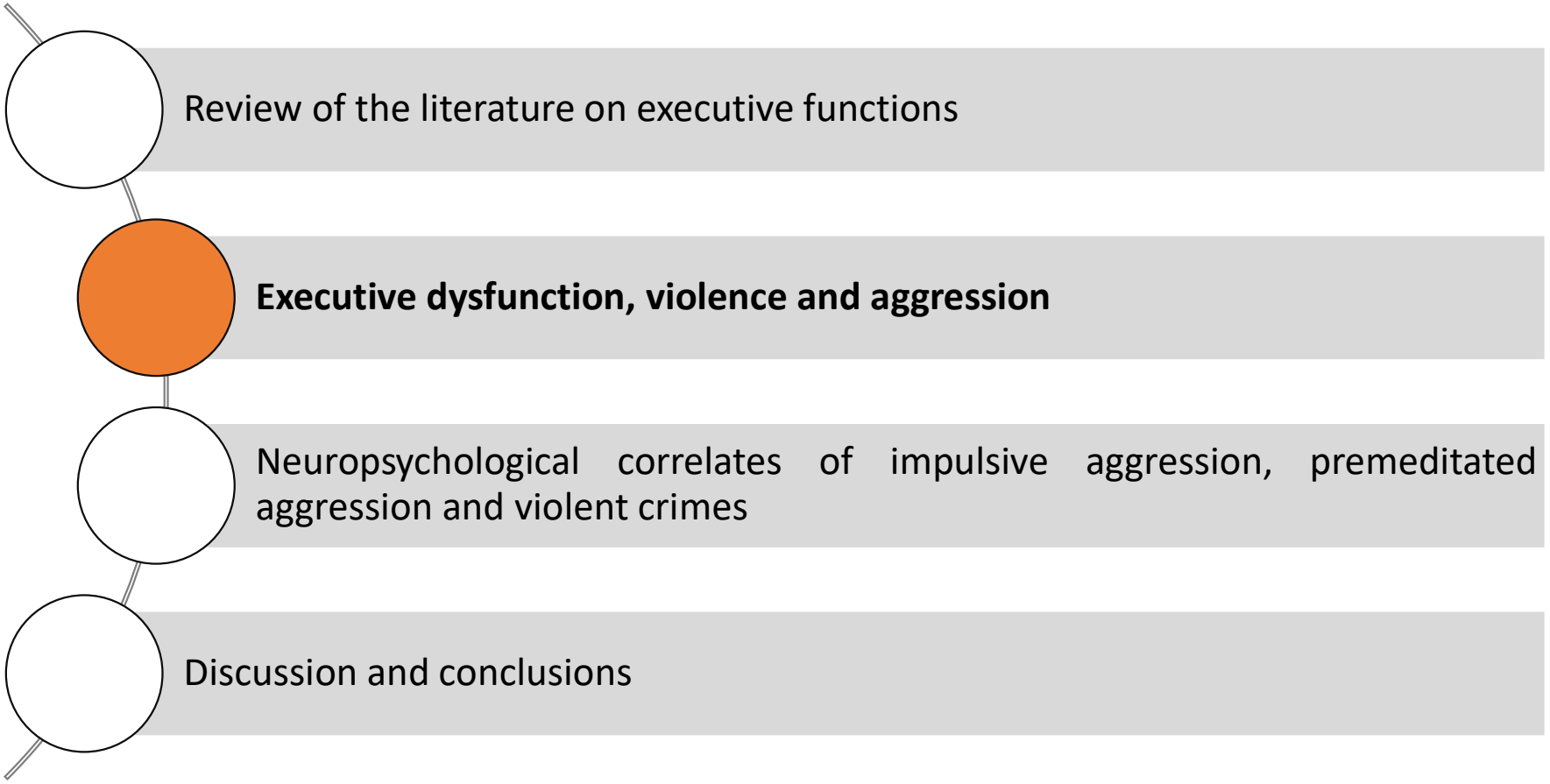
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Executive functions and crime

Executive functions and criminal behaviour

Significant associations were found between prefrontal dysfunction and antisocial and aggressive behaviour, measured by neuropsychological instruments

(e.g., Baker & Ireland, 2007; Brower & Price, 2001; Hancock, Tapscott, & Hoaken, 2010; Ogilvie, Stewart, Chan, & Shum, 2011; Paschall & Fishbein, 2002)

- Overlap between violent and nonviolent groups (Pennuto, 2007; Robertson, Taylor, & Gunn, 1987)
- Both offenders group performed poorly than controls, violent offenders performed worse, but not significantly so (Hoaken, Allaby, & Earle, 2007)
- Executive dysfunction seems to have a stronger link with violent crimes (Ross & Hoaken, 2011)
- Executive impairments characterize boys with life course persistent antisocial path (Raine et al., 2005)
- Different developmental trajectories of physical violence and theft during adolescence and early adulthood; trajectories related to different neurocognitive functioning (Barker et al., 2007)

Executive functions and aggression

Impulsive

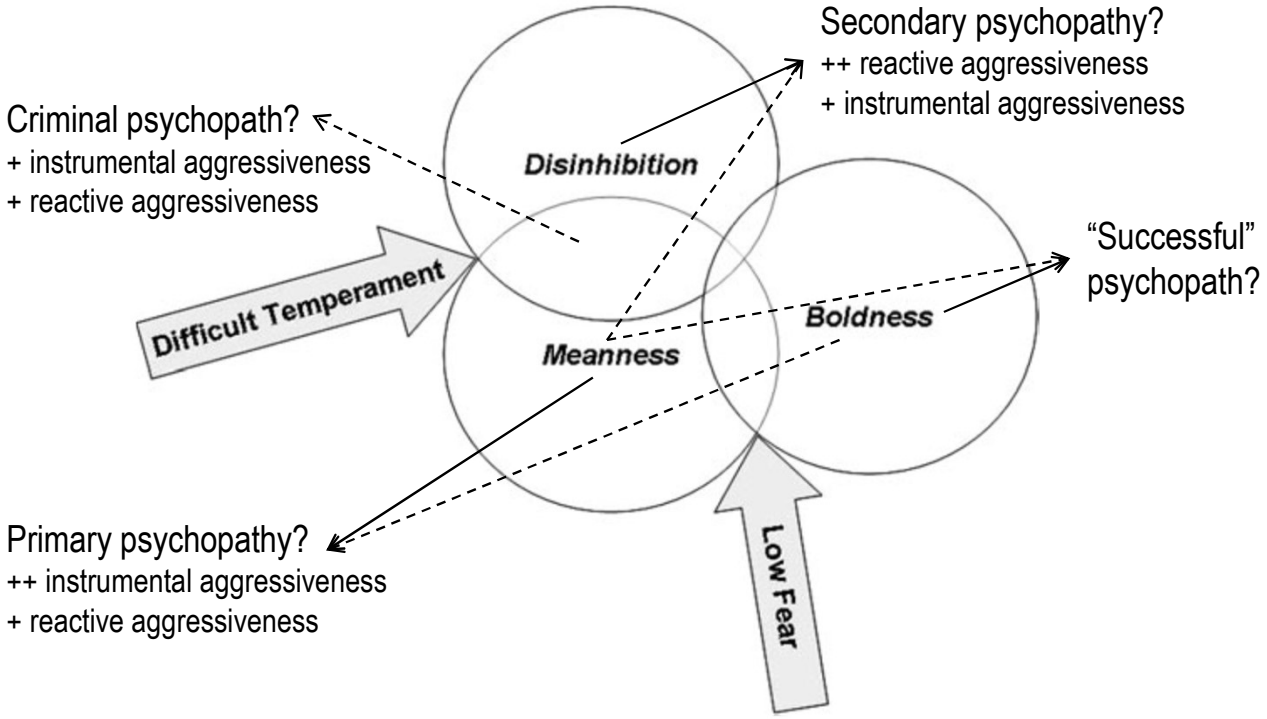
- Rapid / Unplanned / Uncontrolled
- Spontaneous and reactive
- Poor cognitive control
- Executive deficits (working memory?)

Premeditated

- Goal-driven / Planned
- Intentionally executed
- Instrumental and cold-blooded
- No executive deficits (?)

e.g., Brower & Price, 2001; Mathias et al., 2007; Villemarette-Pittman et al., 2003

Triarchic model of psychopathy



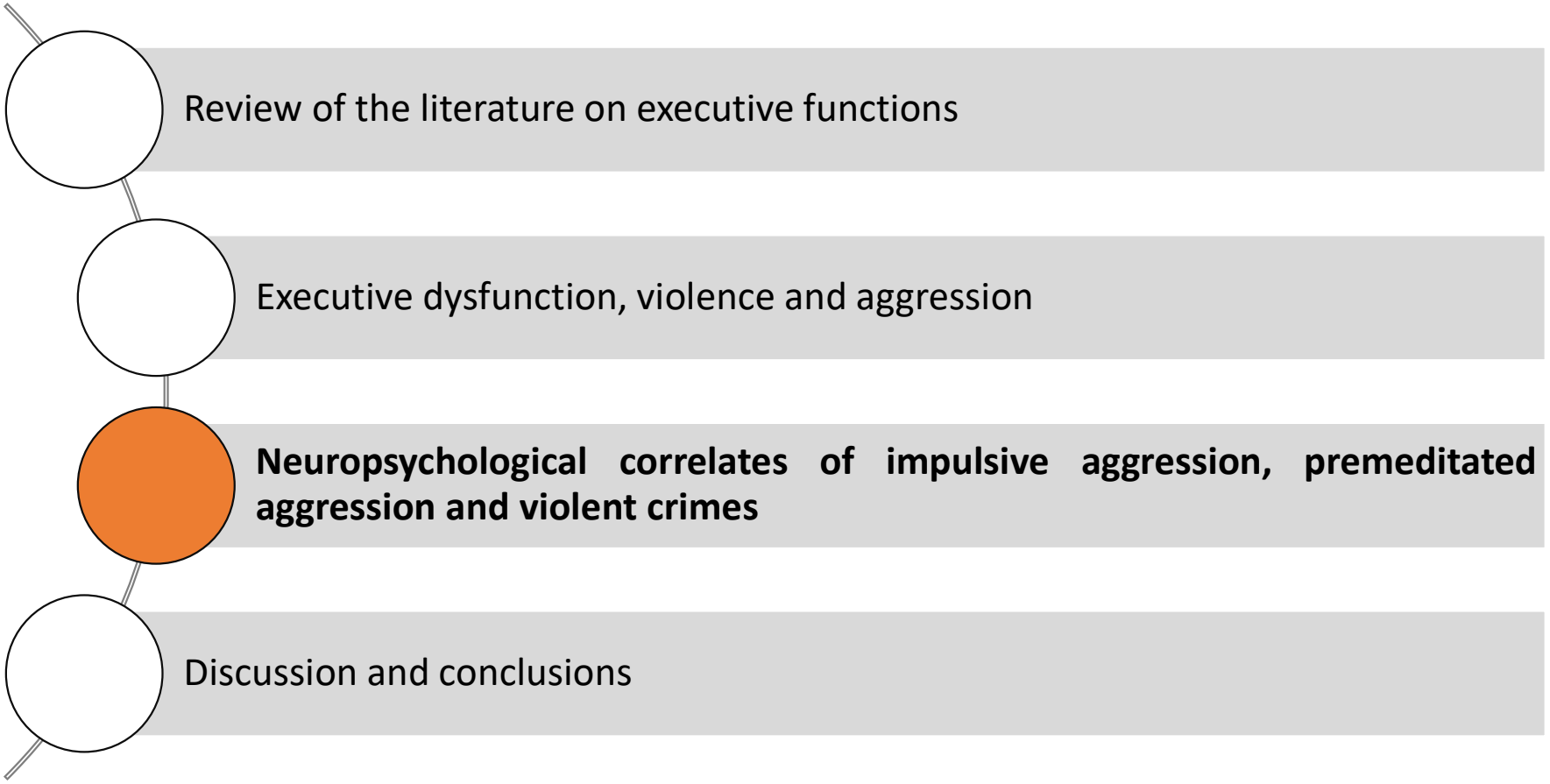
Patrick et al., 2009; Adapted from Barbosa, 2014

Executive functions and psychopathy

Psychopathy has been presented has a robust predictor of:

- Criminal violence (Salekin, Rogers, & Sewell, 1996)
- Recidivism (Andrade, 2008; Salekin et al., 1996; Woodworth & Porter, 2002)
- More contacts with the criminal justice system, and violent incidents throughout incarceration (Andrade, 2008; Hakkanen-Nyholm & Hare, 2009)

It is not consensual whether psychopathic individuals perform poorly on measures of executive function, demonstrating distinct offending and neurocognitive profiles, display minimal impairments, or present deficits in components such inhibition (cf. Bagshaw, Gray, & Snowden, 2014; Baskin-Sommers et al., 2015; De Brito et al., 2013; Ogilvie et al., 2011; Viding, 2004)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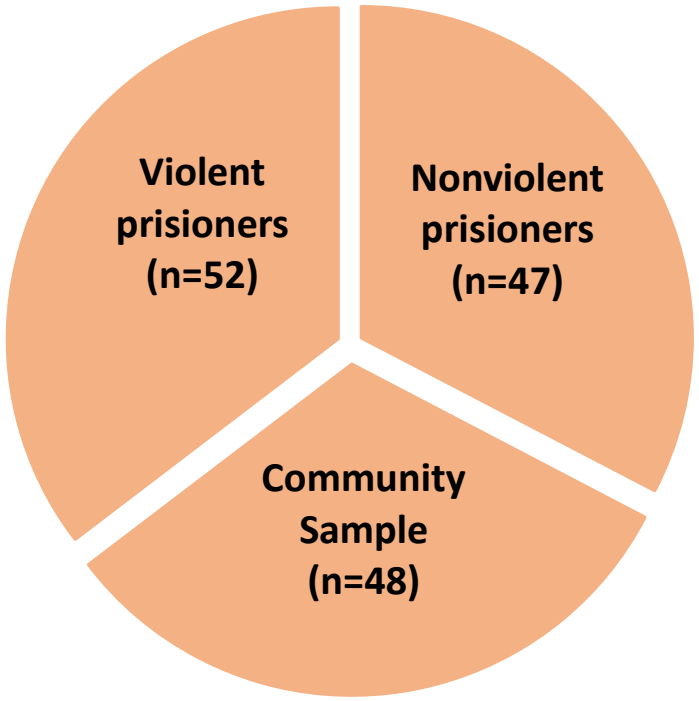
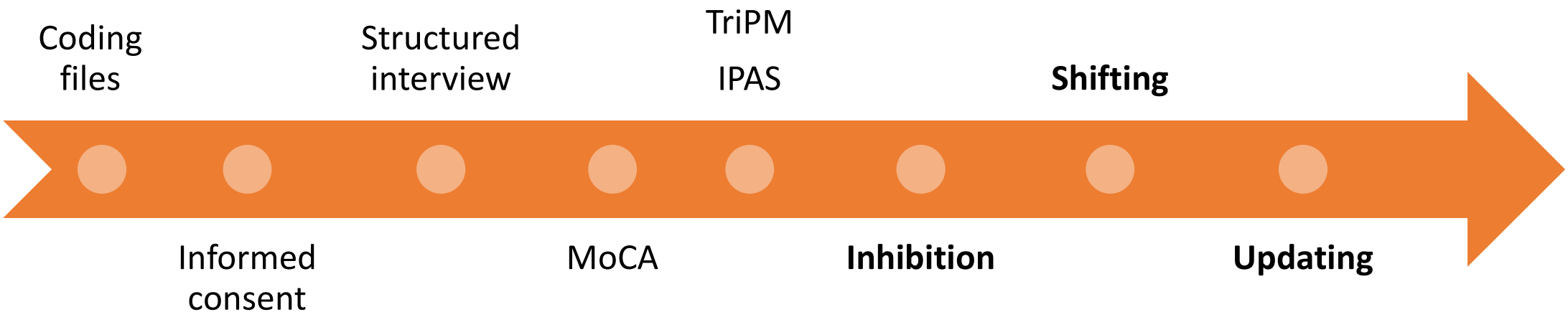
Sample



Means and standard deviations for demographic variables

	Community sample	Nonviolent prisoners	Violent prisoners	Post-hoc (Unequal N HSD)
Age	38.4 (13.1)	44.2 (10.6)	38.7 (11.5)	C = V < NV
Years at school	10.6 (4.24)	8.38 (3.74)	6.83 (2.66)	V = NV < C

Measures and procedures



Hypotheses

H1 – Executive functioning predicts impulsive aggression

Multiple linear regression

Worse performance on updating tasks predicts higher impulsive aggression, measured by IPAS Ia scores, $t(46) = -2.23$, $p = .031$, with $\beta = -.337$.

Hypotheses

H2 – Executive functioning predicts premeditated aggression

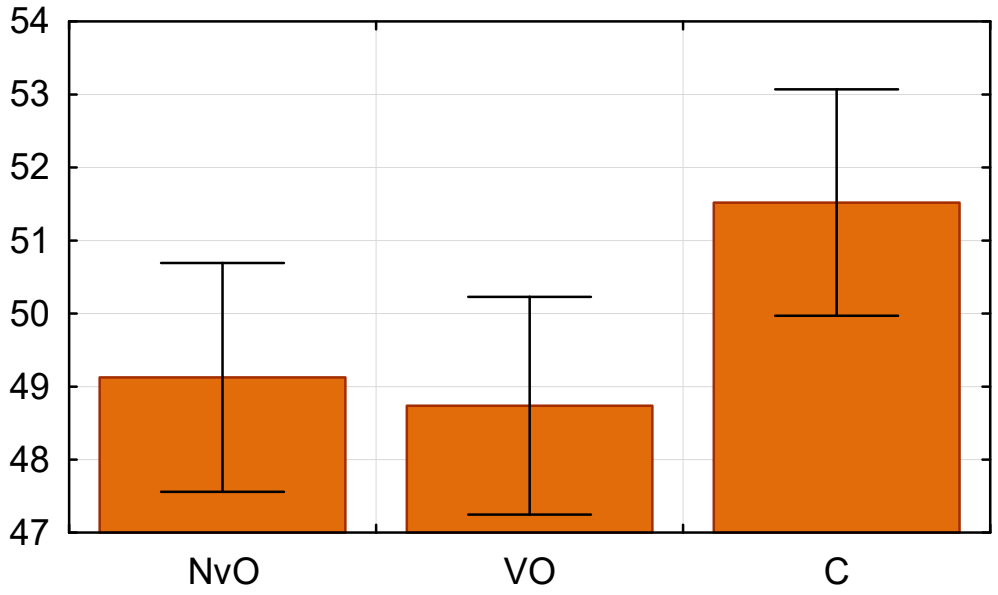
Multiple linear regression

Better performance on shifting tasks predicts higher premeditated aggression, measured by IPAS Pa scores, $t(46) = .2.26$, $p = .029$, with $\beta = .349$.

Hypotheses

H3 – Violent offenders have worse results than non-violent offenders and community controls in all executive functioning domains

Independent ANCOVA considering Group as independent factor



Mean scores on inhibition by group (bars represent the mean ± 0.95 confidence interval)

Hypotheses

H3 – Violent offenders have worse results than non-violent offenders and community controls in all executive functioning domains

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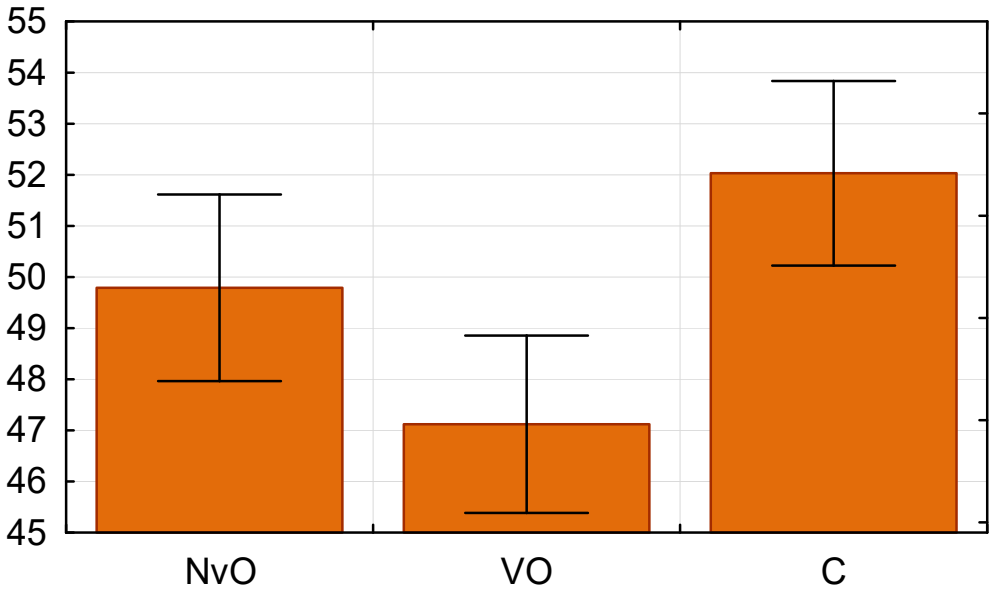
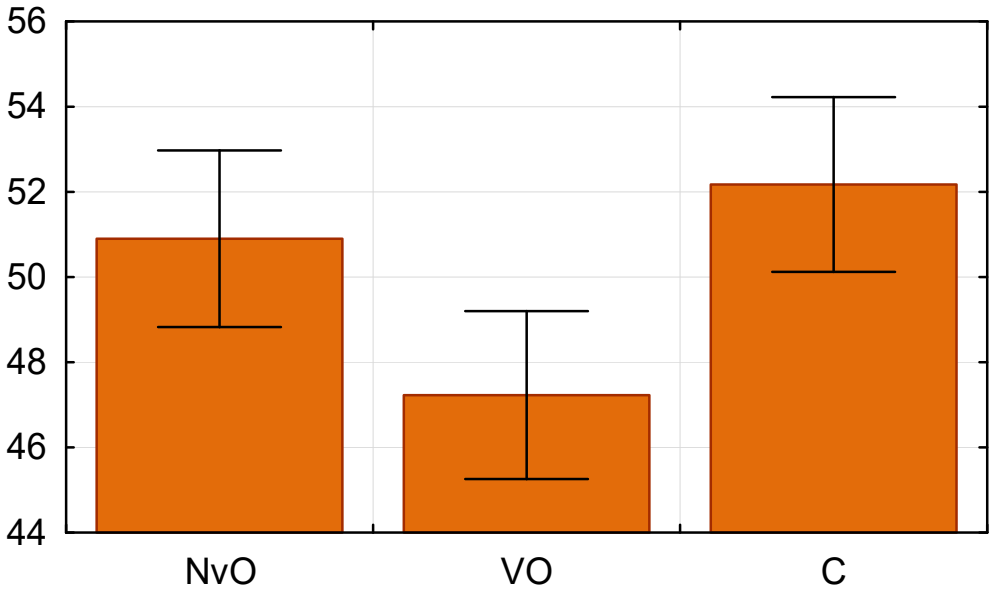


Mean scores on shifting by group (bars represent the mean ± 0.95 confidence interval)

Hypotheses

H3 – Violent offenders have worse results than non-violent offenders and community controls in all executive functioning domains

Independent ANCOVA considering Group as independent factor



Mean scores on updating by group (bars represent the mean ± 0.95 confidence interval)

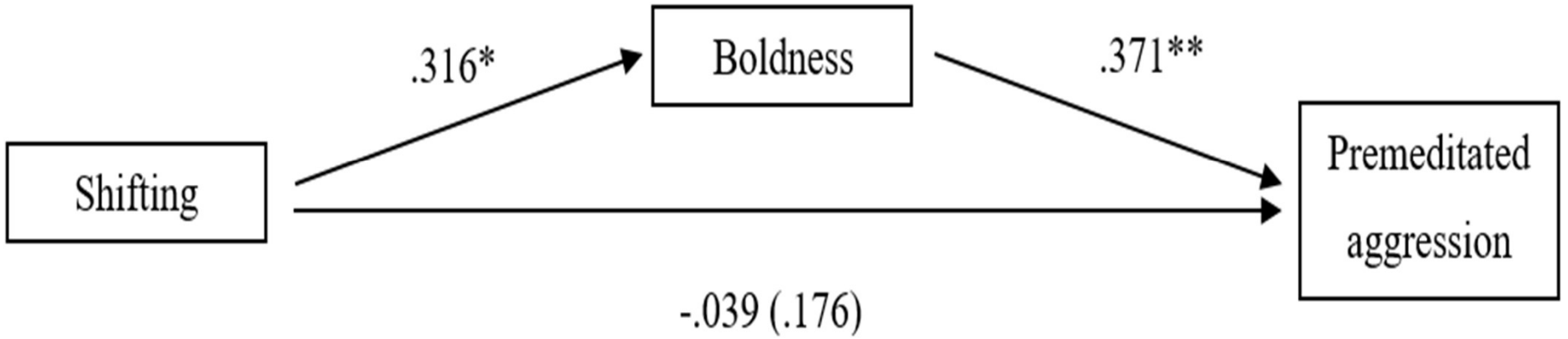
Hypotheses

H4 – Violent differ from non-violent offenders with regards to the dominant pattern of aggression

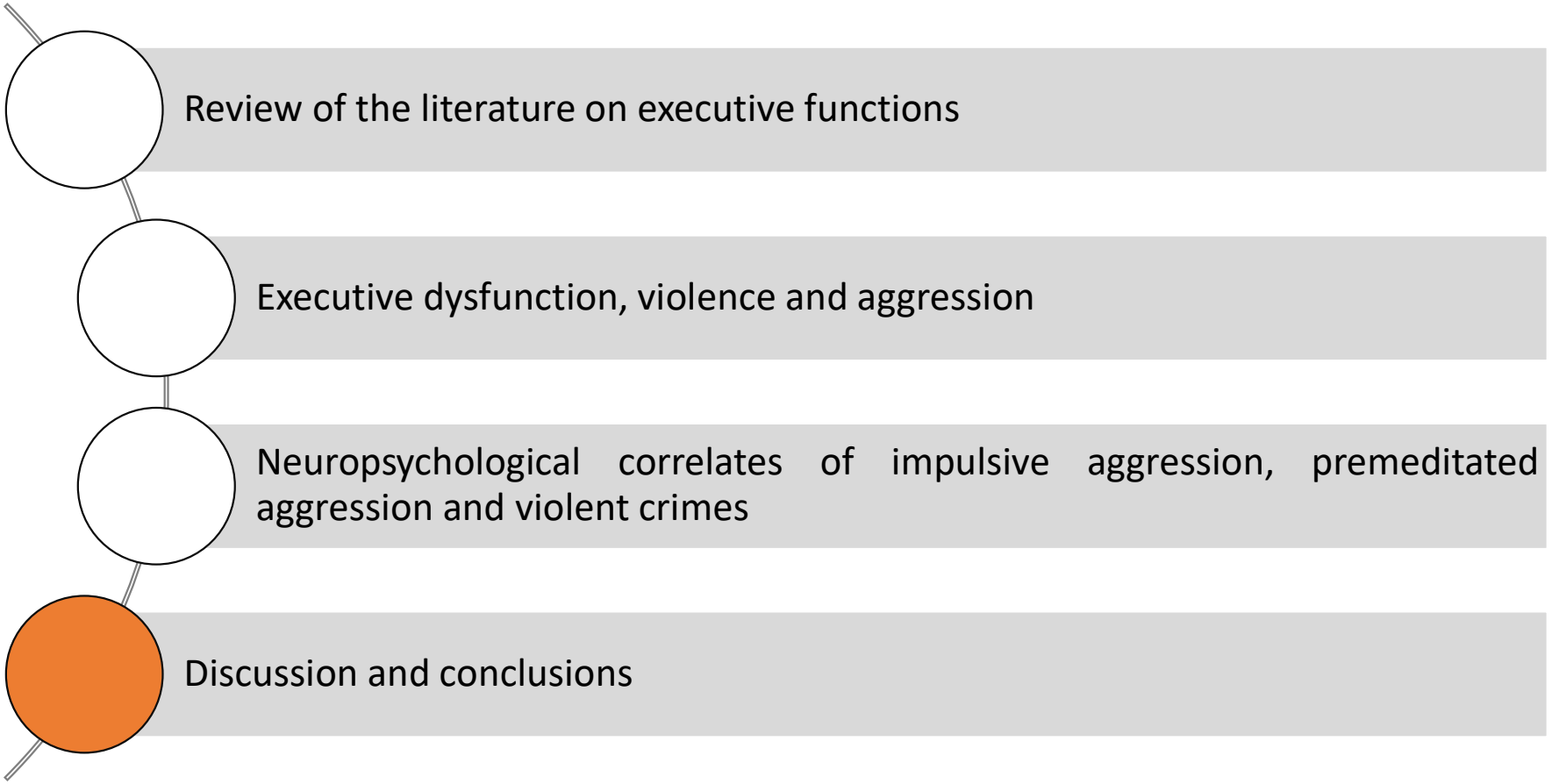
When comparing violent to non-violent inmates on Ia scores of the IPAS we found a statistically significant difference between groups, $t(27) = 2.55$, $p = .015$, $d = .745$, with violent offenders scoring higher on impulsive aggression than their non-violent counterparts.

Hypotheses

H5 – The association between EF measures and aggressive behavior is mediated by psychopathic traits



*p = .012. **p = .046.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Conclusions

- Violent inmates revealed higher Ia scores when compared to nonviolent inmates
- Updating appeared to be more compromised in impulsive/violent offenders – worse performance on the updating tasks predicts higher Ia scores
- Better shifting ability is associated with higher scores on Pa
- Association between shifting, Pa and psychopathy mediated by boldness
- Instead of a general executive dysfunction, offenders revealed impairment in specific domains

Conclusions

- Inhibition
- Shifting
- Updating

Executive Functions

Psychopathy

- Boldness
- Meanness
- Disinhibition

- Impulsive
- Premeditated

Aggression

Conclusions

Limitations

- No access to clinical files
- Use of self-report questionnaires
- Impact of incarceration on aggressive tendencies and executive functioning

Conclusions

Future directions

- Intervention and management strategies addressing specific deficits in order to optimize cognitive control in demanding and complex situations - costs associated with incarceration and recidivism rates.
- Include formal IQ and mental health measures
- Create more homogeneous subgroups of violent and non-violent individuals
- Replicate the research in a sample of women convicted of the same crimes

Study the executive and emotional correlates of aggression in offenders exposed to early adversity and maltreatment.