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Photostimulation of Distinct Prefrontal-hypothalamic Projections Differently Modulate Aggressive Behavior

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Aggression control is associated with many cognitive and emotional aspects processed by the prefrontal cortex (PFC). Previous studies suggested that the PFC inhibits the hypothalamic areas of aggression via indirect pathways through the amygdala. Although our former studies showed that the infralimbic and prelimbic regions of the PFC send direct projections to the mediobasal and lateral hypothalamus in rats (MBH and LH respectively), the role of these projections in aggressive behavior is still unknown. We used an optogenetic projection targeting approach to investigate the contribution of prefronto-hypothalamic pathways to the manifestation of aggression. MBH regulates intraspecific aggression, and photostimulation of the PFC-MBH pathway resulted in elevated attack numbers accordingly. Despite of the LH is generally known for the regulation of predatory behavior, it is also implicated in the intraspecific aggression. Activation of the PFC-LH pathway altered merely the qualitative aspects of aggression, namely the ratio of attacks targeted vulnerable bodyparts and non-signalled attacks was increased. To understand the behavior effect of projection stimulation we determined the phenotypes of the presynaptic prefrontal neurons in the hypothalamus. Immunostaining for vesicular glutamate transporter 1 (vGLUT1) and vesicular GABA transporter (vGAT) showed that the prefrontal input of the examined hypothalamic areas was exclusively glutamatergic. The axonal photostimulation of these glutamatergic neurons was sufficient to induce elevated neuronal activity in the postsynaptic hypothalamic areas indicated by increased number of c-Fos positive neurons. Overall, our data implies the PFC directly modulates the quantitative and qualitative properties of aggressive behavior via distinct excitatory hypothalamic projections.

Men's Aggression Towards Sexualised Women Restores Feelings of Sexual Dominance

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Researchers have become increasingly interested in the saturation of popular Western culture by female hypersexualisation. This trend encompasses the tendency for women to be sexually objectified in mass media, a shift towards more permissive sexual attitudes, and a preoccupation with sexual identities. In the current study, we examined whether female sexualisation increases the likelihood of male aggression. One-hundred and fifty-seven men interacted with a woman presented as high or low in sexual openness under the guise of a dating game. They completed a task measuring sex goal activation and were rejected by the woman and told they were a substandard romantic date. All participants then completed a laboratory analogue of aggressive behaviour ostensibly against the woman they interacted with. To investigate whether aggression restored feelings of dominance over women, participants then rated their feelings of sexual dominance. We found that interacting with a sexually open woman increased men's sex goals. Sex goal activation, in turn, predicted increased aggression, which elevated feelings of sexual dominance over women. Effects held when controlling for the influence of trait aggressiveness and negative affect. These findings imply that scenarios that activate male sex goals increase the likelihood of aggressive responses. By keeping men in a perpetual state of low sex goal activation,

Western cultural hypersexualisation increases the likelihood that men will perpetrate aggression against women.

Aggression as an Applied Welfare Problem Studied Through a Game Theoretical Approach
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Aggression between group housed pigs has been a longstanding animal welfare issue in commercial pig husbandry. Despite decades of research, aggression between pigs is poorly understood at a fundamental level. We combine game theory models from behavioural ecology with applied animal behaviour studies to deepen our understanding of aggression between pigs. This 3-year project is aimed at gaining insight into the information-gathering and decision-making capabilities of pigs to improve their welfare. In a first experiment (*Animal Behaviour* 108(2015):183-191), 57 dyadic contests took place between size-matched pigs which differed in their aggressiveness assayed as a personality trait. Aggressiveness did not affect the contest duration or chance of winning, suggesting that aggressiveness was not a component of fighting ability. Aggressiveness as a personality trait did influence the initiation of attacks and the type of behaviour displayed. In a recently finished second experiment we tested pigs' ability to assess their own fighting ability and that of their opponent, making reference to appropriate game theory models based on either self- or mutual assessment. This involved staging dyadic contests between pigs (n=316) matched for either high or low aggressiveness. Dyads were either size-matched or size asymmetric, as recommended to distinguish between assessment strategies. Initial results highlight that high aggressive dyads were able to establish dominance relationships sooner than low aggressive dyads, although at greater physiological costs. Findings will be presented that reveal the assessment strategy used, whether this differs according to aggressiveness and prior experience of fighting, and the welfare implications for current husbandry practices.

Aggressive Behavior in Autism Spectrum Disorders Preschool Children With or Without Attention-Deficit/Hyperactivity Disorder

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Objective: To investigate the pattern of aggression in children with only ASD and ASD comorbid with ADHD, and explore whether aggressive behavior is associated with the severity of sleep problems and autism symptoms. Methods: Three hundred and seventy five ASD children, 129 ASD children comorbid with attention-deficit (ASD+AD), 75 ASD children combined with attention-deficit and hyperactivity disorder (ASD+ADHD), and 428 control children, age 4-6 years, were recruited in this study. Modified Overt Aggression Scale (IBR-MOAS) was used to measure the pattern of aggression. This scale includes five domains: verbal aggression toward others (VAO), verbal aggression toward self (VAS), physical aggression against other people (PAP), physical aggression against objects (PAO) and physical aggression against self (PAS). Children Sleep Habits Questionnaire (CSHQ) and Social Responsiveness Scale (SRS) were used to measure the severity of sleep problems and autism symptoms, respectively. Results: The total scores of IBR-MOAS were significant different among four groups after control gender of children and parental education level. The total and all sub scores, except PAO, of IBR-MOAS in ASD+ADHD group were significant higher than other groups (all, $p < 0.05$). The total IBR-MOAS score and sub scores of VAS, PAO and PAS in ASD+AD group were significant higher than control group (all, $p < 0.05$); the sub scores of PAO and PAS in ASD+AD group were significant higher than ASD group (all, $p < 0.05$). The sub score of PAS in ASD group was significant higher than control group ($p < 0.001$). Although there was no significant different in the total score of

CSHQ among four groups, the total and all sub scores of IBR-MOAS positively associated with the total scores of CSHQ in whole subjects significantly (all, $p < 0.05$). The total scores of SRS were significant different among four groups. The IBR-MOAS total and sub scores of VAS, PAO and PAS positively associated with the total scores of SRS in whole subjects significantly (all, $p < 0.05$). Conclusion: The pattern of aggressive behavior in children with only ASD and ASD comorbid with ADHD was different. ASD children had more self-injurious behavior than normal children. However, when ASD comorbid with ADHD, children would not only had worse autism symptoms, but also had more aggression against themselves and others. Aggressive behavior positively associated with the severity of sleep problems and autism symptoms.

The Role of Positive Affect in Aggressive Behavior

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What motivates people to act aggressively? Classic theorizing has proposed that aversive, negatively-valenced affective states (e.g., anger, pain) impel us to act aggressively. Dating back to Freudian notions of catharsis, scholars have suggested that pleasant, positively-valenced feelings may also underlie aggressive tendencies. A growing body of research from psychology and neuroscience suggests that this may very well be the case. Individuals appear to enjoy harming others, particularly when it is in retaliation to a perceived provocation. Such 'sweet revenge' is reflected in altered biological systems of reward and self-control. Consistent with prominent theories of emotion, the anticipated enjoyment predicts substantial and unique variance in aggressive behavior. Further, the pleasure of revenge is employed strategically to regulate affective states (with mixed results). These findings argue for the inclusion of positive affect in the pantheon of causes of aggressive behavior. They suggest novel hypotheses and avenues for intervention. For example, aggression appears to closely resemble an addictive behavior such as alcohol dependence. Models of addiction may then be a fruitful area of integration with the aggression literature. In summary, positive affect has long been neglected in the field of aggression research and now stands to make a substantial contribution to our understanding of and attempts to reduce aggressive behavior.

A Meta-Analysis of Prosocial Media on Prosocial Behavior, Aggression, and Empathic Concern: A Multidimensional Approach

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Studies examining the effects of exposure to prosocial media on positive outcomes are increasing in number and strength. However, existing meta-analyses use a broad definition of prosocial media, while not recognizing the multidimensionality of prosocial behavior. The aim of the current study was to conduct a meta-analysis on the effects of exposure to prosocial media on prosocial behavior, aggression, and empathic concern (i.e. sympathy and empathy), while examining multiple moderators that the prosocial behavior literature suggests are important to our understanding of why individuals voluntarily help others (e.g., target, motivation, type). Results from 65 studies, involving 176 effect sizes revealed that exposure to prosocial media was related to higher levels of prosocial behavior and empathic concern, and lower levels of aggressive behavior. Moderation analyses suggested effects of prosocial media were stronger among children as compared to adolescents. Additionally, effects were stronger for experimental studies as compared to longitudinal ones. Analyses examining prosocial behavior as a multidimensional construct revealed that effects were different based on motivation and target of prosocial

behavior. Comparisons with other meta-analyses on media effects are made and implications for parents, media producers, and researchers are discussed.

Association of Low Activity Monoamine Oxidase-A Genetic Variants and Abnormal Amygdala Morphology in Violent Offenders with Antisocial Personality Disorder

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Background: Violent offending is increased among individuals with antisocial personality disorder (ASPD). Morphological abnormalities of the amygdala, a key brain emotion processing region, are present in violent offenders. Among healthy males, monoamine oxidase-A (MAO-A) genetic variants associated with low transcription in vitro (MAOA-L) are related to structural abnormalities of the amygdala. However, it is currently unknown whether amygdala morphology in ASPD relates to MAO-A genetic polymorphisms. We hypothesized that amygdala surface area abnormalities would associate with MAOA-L genotype in violent ASPD males. **Methods:** We studied 18 males who had ASPD and a history of violence and 20 healthy male controls. Genomic DNA was extracted from peripheral leukocytes with MAO-A genetic polymorphisms determined using standard PCR procedures. Each subject underwent a T1-weighted MRI anatomical brain scan that provided vertex-wise measures of amygdala shape and surface area. **Results:** A group \times genotype interaction predicted surface area in regions of the right amygdala ($t=3.4$, $p=0.002$, $df=32$, $FDR=10\%$). ASPD subjects with MAOA-L showed decreased surface area in right basolateral amygdala ($t=3.4$, $p=0.005$, $df=13$, $FDR=10\%$) and increased surface area in the right anterior cortical amygdaloid nucleus ($t=3.4$, $p=0.005$, $df=13$, $FDR=10\%$) compared with healthy MAOA-L carriers. No group differences were observed among carriers of the high MAO-A allele (MAOA-H). **Conclusions:** This is the first study to describe genotype-related morphological differences of the amygdala in a population marked by high aggression and violence. Deficits in emotional regulation that contribute to the violence of ASPD may relate to morphological abnormalities of emotion processing regions under genetic control.

Early Bonding Interactions and the Development of Antisocial Behaviour

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It is now a well-established fact that the best predictor of antisocial behaviour in adults is antisocial behaviour in children (Farrington 1995; Robins, 1978). However, the antecedents of childhood antisocial behaviour are largely unknown, with most studies focused on sociological variables, such as parental education and employment, pre-existing mental health conditions, and socioeconomic status. Instead, our investigation focused on whether early social interactions between infants and caregivers were associated with antisocial behaviour. To do this a large community sample ($n=200$) was surveyed (retrospectively) about their early bonding experiences as well as the child's current attachment and antisocial behaviours. We used two innovative questionnaires developed specifically to assess attachment behaviours from children as well as bonding appraisals from a primary caregiver. Results suggest that particular periods during upbringing, as well as specific emotions towards the infant, might be associated with the development of an antisocial presentation. Likewise, parental reports of the child's attachment behaviours were related to the child's antisocial presentation. Our results suggest that looking more carefully at early interactions, particularly those with attachment figures, might reveal hitherto unexplained variance in the aetiology of antisocial personality disorders.

Violent Victimization of Those Receiving Unemployment Benefits, and Its Toll on Mental Health Vary Across Community Socio-economic Status

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People reliant on government benefits are typically considered to represent the lowest social class. In many countries, a common stereotype is that welfare recipients are “lazy and dependent”. The presence of these negative stereotypes implies that welfare recipients are a stigmatized group that may be at risk of discrimination and hostility. However, despite there being much evidence of structural and internalized stigmas, there has been little direct, quantitative evidence of interpersonal discrimination directed at welfare recipients. One extreme form of discrimination is violence. To this end, we compared the violent victimisation of welfare recipients to that of non-recipients. One of the major challenges of studying welfare stigma is its conflation with low socio-economic status (SES), which is also associated with risk of violent victimization. Using a longitudinal panel of 19,236 Australians followed for 12 years, we found evidence that having ever received unemployment benefits over this 12-year period was associated with a higher risk of being assaulted in this time period when compared to people living in low SES communities who had never received unemployment benefits. This risk was exacerbated in years when the person received unemployment benefits and eliminated the safety benefit of living in a high SES area. We also found that these experiences of violent victimization directly impacts mental health. The implications of this consistent risk is considered against a backdrop of our other recent findings that the stigmatization of former welfare recipients dissipates when they return to work.

Intimate Partner Violence and Post-relationship Stalking Perpetrators' Cognition as Aggressive Relational Schemas

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Social-cognitive theories of aggression have been used to explain how cognition is involved in violent and sexual offending. However, such theories have yet to be tailored to aggression that occurs in romantic contexts: Intimate partner violence (IPV) and post-relationship stalking (PRS). Murphy recently emphasised the usefulness of Social Information Processing (SIP) theory for IPV research and etiological theorising (Murphy, C. M. [2013]. Social information processing and the perpetration of intimate partner violence: It is (and isn't) what you think. *Psychology of Violence*, 3 [3], 212-217). He argued that many psychological risk markers of IPV share underlying maladaptive socialcognitive processes, which can be studied using a SIP framework. To examine the nature of these processes, the presented poster integrates SIP theory with Relational Schema Theory, a socialcognitive theory on information processing in close relationships. This integrated theory proposes that Aggressive Relational Schemas (ARMS) underlie many psychological risk markers of relationship aggression. Drawing from the rather isolated literatures on those risk markers of relationship aggression such as insecure attachment and antisocial cognition, we propose an integrative account on the content of ARMs. Implications of viewing cognition associated with perpetrating relationship aggression as ARMs will be discussed.

Limiting Access to Firearms To Prevent Violence Towards Oneself and Others: Determining the Relative Utility of the Terms "Means Safety" and "Means Restriction"

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Objective: This study aimed to describe the relative utility of the terms “means safety” versus “means restriction” in counseling individuals to limit their access to firearms in the context of a mock risk assessment for self-directed violence (cf. suicide). **Methods:** Overall, 370 participants (Mage = 19.35y, SD = 1.77y; 71.9% female; 73.0% White) were randomized to read one of two vignettes depicting a clinical scenario in which managing firearm ownership and access was discussed either using the term “means safety” or “means restriction.” Participants then rated their intention to disclose firearm ownership and access to a clinician and adhere to clinician recommendations, as well as the relative acceptability and preferability of each term. **Results:** Overall, participants rated the term “means safety” as significantly more acceptable ($t[369] = 14.006, p < .001$) and preferable ($t[369] = 16.781, p < .001$) as compared to “means restriction.” Across vignette groups, no significant differences emerged with respect to participants’ reported willingness to disclose firearm ownership and access. However, participants randomized to the “means safety” condition were significantly more likely to report intentions to adhere to clinicians’ recommendations to limit access to a firearm for safety purposes ($F[1,367] = 7.393, p = .007, \eta^2 = .020$). **Conclusions:** Findings suggest that the term “means safety” may be more clinically advantageous than “means restriction,” resulting in greater adherence to clinician recommendations. Future research is needed to replicate these findings among more diverse samples in clinical settings.

Sexual Harassment as a Hurdle to Female Political Participation in Bangladesh

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Elected representatives of the rural local governance in Bangladesh, 65 females, and 76 males, filled in a questionnaire regarding workplace experiences. The age range was between 29 and 60 years. The questionnaire included scales for measuring (a) perceptions of possibilities to influence political decision making, (b) work stress, (c) negative workplace atmosphere (Björkqvist & Österman, 1998), (d) work harassment (ibid.), (e) sexual harassment of women (experiences of women/observations made by men) (Kamal & Tariq, 1997), (f) negative impact of family on female political participation, and (g) hurdles to female participation in political decisions. The results showed that females experienced significantly higher levels of work stress, negative workplace atmosphere, and work harassment, as well as less influence on political decision making. In contrast to this, the negative impact of families on women’s political participation was estimated by males to be significantly stronger than was showed by the ratings made by the women themselves. Women who had experienced more than average amounts of sexual harassment at work scored significantly lower on possibilities to influence political decision making, and higher on work stress, negative work atmosphere, and work harassment. Males who had observed lower than average levels of sexual harassment of women scored highest of all groups on negative impact of family on female political participation. The study served as a pilot study on the basis of which the questionnaires were refined for a more substantial data collection.

Examining the Impact of Parental Offending on Offspring Aggression in Early Childhood: A Population-Based Record Linkage Study

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Longitudinal research shows that antisocial behaviour and aggression are often transmitted from parent to child. However, few studies consider the impact of parental offending on the

development of offspring aggression in early childhood. The current study examines the influence of both maternal and paternal offending on offspring aggression at age 5 years, while also considering key risk factors including parental mental illness, child's sex, and socio-economic disadvantage. The sample consists of 66,477 children and their parents from the NSW Child Development Study (<http://nsw-cds.com.au>), a population-based multi-agency, multi-generational record linkage study that combines information from a teacher-reported cross-sectional survey with data obtained by linkage of administrative records from multiple sources since birth (e.g., health, crime, education, welfare). The current study includes data from parental criminal court appearances, mental health presentations, and the 2009 Australian Early Development Census. Hierarchical logistic regression analyses showed that having a parent with a history of offending is significantly associated with high levels of aggression in early childhood. The strength of association was greatest when parents were involved in frequent (≥ 6 offences: OR=1.8 to 2.1) and violent (OR=1.7 to 1.9) offending, and was also greater when mothers (OR=1.1 to 2.1) had a history of offending compared to fathers (OR=1.3 to 1.8). Both maternal and paternal offending remained significant when parental mental illness was included in the models. Findings suggest that having a parent with a history of offending impacts the development of aggression in offspring during early childhood, even after accounting for other important risk factors.