

Exploring the relationship between connectedness to nature and social connectedness in a female offending population.

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Abstract

Objective: To explore connectedness to the natural and social worlds across three female-only groups, offenders, non-offenders and nature lovers.

Design: A questionnaire survey design exploring the extent to which group members differed on self rated social and natural connectedness was employed. The constructs of connectedness to nature and social connectedness were predicted to correlate.

Methods: 630 participants completed a three part survey. The survey included demographic details, a nature connectedness scale and a social connectedness scale.

Results: Analysis revealed significant differences between the groups in terms of their self rated connectedness to nature and to the social world. Offenders were found to be less connected to both the natural and social worlds than either of the two comparison groups. A correlational analysis revealed a positive correlation between connectedness to nature and social connectedness suggesting that the stronger an individual's connectedness to nature, the stronger his/her connection to the social world.

Conclusions: The findings are discussed in the context of social connectedness theory. Future applications of the findings to work with female offenders were also mooted.

Keywords: social exclusion, social connectedness, nature connectedness, belongingness, female offenders, attachment.

Introduction

Social exclusion refers to '*a complex and multi-dimensional process. It involves the lack or denial of resources,....and the inability to participate in normal relationships and activities.*' (Levitas, 2007, p.9). To establish the extent to which female offenders were socially excluded, The Social Exclusion Task Force (2009) compiled a short report on women in the Criminal Justice System (England and Wales). The researchers reported that women in the Criminal Justice System had high levels of need, which was assessed using the Offender Assessment System (OASys). The OASys is an assessment tool used by the National Offender Management System (NOMS) with a number of objectives, including matching the offender's needs with supervision and sentence plans. The task force researchers (Social Exclusion Task Force, 2009) examined data from 11,763 women between 2005-2007 and concluded that of the 11 needs assessed in the tool, 80% of participants had needs in two or more areas and 62% had needs in three or more. For those

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women with two or more needs the most common were: emotional (74%), relationships (74%), skills and employability (72%), drugs (32%) and alcohol (39%).

The needs identified by the task force concurred with those identified by academic researchers (e.g. Blanchette & Brown, 2006; Corston, 2007; Covington & Bloom, 2007; Deedes, 2009; Fortune, Thompson, Pedlar & Yeun, 2010; Hardwick, 2012; Lyon, 2012; Social Exclusion Task Force, 2009). There is evidence from other marginalised groups with similar need profiles to suggest that reconnection and employability skills can be enhanced simultaneously through social therapeutic work in nature (e.g. Parkinson, Lowe & Vecsey, 2011; Sempik & Aldridge, 2006). The present exploratory study sought to examine the concept of connectedness further, focusing on connectedness to nature and to the social world.

Social Exclusion and connectedness

Social exclusion is demonstrable and has corporeal consequences, people lack access to services, opportunities or goods. The psychological experience of exclusion is referred to as the level of *social connectedness* and can be differentiated from the popular concept of social capital (Bourdieu & Passeron, 1990; Portes, 2000; Schuller, 2001) by its phenomenological characteristics. Social connectedness has been defined as '*a person's subjective awareness of being in close relationship with the social world in toto*' (Lee & Robbins, 1998, p. 415). Social connectedness relates to how a person feels relative to the mainstream and how connectivity is experienced in the world. It is argued that as people work to fulfil a need for belonging and connection they develop a stable, secure sense of self (Baumeister & Leary, 1995; Kohut, 1984). One of the key needs assessed using the OASys and explicitly identified as important by the Social Exclusion Task Force (2009) in the lives of female offenders, were their human relationships. Theoretically, relationship needs have been situated within social exclusion research, i.e. as a result of social exclusion people are unable to access the goods and services required by legitimate means and so find alternative means of gaining access. The psychological impact of exclusion, however, has often been neglected in academic research (Lee & Robbins, 1995).

Exclusion does not simply prevent individuals from meeting tangible needs such as buying food and accessing services, it also prevents people from meeting their need to belong. Kohut (1984) argued that people seek to confirm a sense of belonging in order to avoid feelings of loneliness and alienation. Kohut elaborated that an unconnected person may find it difficult to accept social roles and responsibilities. He/she may become frustrated that others do not appear to understand him/her and, because of the basic lack of belongingness, experience difficulties with concepts such as trust and basic social skills. Whilst related to theories of attachment (e.g. Bowlby, 1988), loneliness (Weiss, 1974) and social support (Newcomb, 1990), Lee and Robbins (1995) argued that belongingness remains distinct because belonging, or an absence thereof, is focused on the concept of self.

The self and interdependent self construct develop in response to the fulfilment or otherwise of fundamental human needs, one of which is the need to belong (Maslow, 1970; Kohut, 1984). Baumeister and Leary (1995) argued that this need evolved for survival purposes. Research exploring neural pain pathways lends some support to this theorising, it has been observed that the same neural pathways that manage physical pain also manage the pain of social rejection (DeWall & Baumeister, 2006). This was interpreted as indicative of the evolutionary importance of belonging for survival, i.e. social rejection was as much of a threat to survival as physical injury. If social rejection is as painful as physical injury, then it is hardly surprising that it impacts so heavily on behaviour (Barstead, 2012).

Sentencing practice capitalises on the strength of this response by socially rejecting those who offend; it is precisely because social rejection and exclusion is so painful that it has been constructed as a deterrent or prompt for behavioural change (Barstead, 2012; Wilson, 2012). However, if female offenders are low on

belongingness as a consequence of their life experiences pre-conviction, then punishments focused on reinforcing stigma and exclusion are unlikely to be effective; if anything the reverse might be predicted. High levels of social connectedness have been found to be related to interpersonal trust, attachment security, social competence, reduced interpersonal difficulties and greater association with social groups (Banai, Mikulincer & Shaver, 2005; Baumeister & Leary, 1995; Lee, Draper & Lee, 2001; Mashek, Stuewig, Furukawa & Tangney, 2006; Maslow, 1970; Moller, Fouladi, McCarthy & Hatch, 2003; Williams & Galliher, 2006). Social connectedness has also been found to correlate with early attachment experiences, such that a strong parent-child bond is positively correlated with positive behaviours (Barber & Schluterman, 2008; Bond et al., 2007; Charuvastra & Cloitre, 2008). Mainstream social connectedness has also been identified as important for desistance from crime (Maruna, 2001; Smith, 2005).

For those who are disconnected research points to ever increasing marginalisation and exclusion. Social connectedness was identified as one of three major needs from which the self is organised (Kohut, 1984). This finding is borne out in studies exploring attachment, mental health and well being (George & Solomon, 1998; Schore, 2001). Findings consistently endorse Kohut's claim that relationships are important for all human beings. The *'interdependent self'* construct or *'social self'* has been shown to impact on cognition, emotion, motivation and behaviour, with findings to suggest that individuals with a high interdependent self construct experience less depression, exhibit less anti-social behaviour and have higher levels of social identification (Barber & Schluterman, 2008; Barber, Stolz & Olsen, 2005; Day and Padilla-Walker, 2009; Lee et al., 2008; Lee & Robbins, 1998; Mashek et al., 2006; Williams & Galliher, 2006). The evidence suggests that social connectedness is a need that is both fundamental and inherent (Fonagy, 2001).

Social connection and female offenders

The social and practical functions of connectedness are perhaps self-explanatory: access to work, financial services, education, housing, non-offending friends, learning social norms and gaining social support. Access to each of these is predicated on an ability to connect with other people. These pragmatic functions all have psychological counter-parts that a number of theorists (Bylington, 1997; Steffenmeister & Allen, 1998) suggest are of particular relevance to women. Miller (1986) proposed that a woman's primary motivation was to build a sense of connection with others, a connection that Bylington (1997) explained as *"an interaction that engenders a sense of being in tune with self and others and of being understood and valued"* (p. 35). However, relationship and reconnection work with a female offender population is likely to be compounded by prior victimisation and trauma experiences (Batchelor, 2005; Covington, 2007; 2008; Covington & Bloom, 2007; Rungay, 2004). In other words the women are doubly disconnected, excluded as a consequence of their offending behaviour and also, frequently, their victimisation. The victimisation is of particular relevance because of its nature (Dixon, Howie & Starling, 2005). The victimisation profiles of female offenders are frequently dominated by childhood abuse at the hands of adults, often family members. Exposure to domestic violence is also common. As adults, many of the women go on to be re-victimised in their own intimate relationships (Bloom, Owen & Covington, 2003; Cloitre, Tardiff & Marzuk, 1996). Despite the potential for under reporting, data consistently suggests that in the region of 60-80% of females within the criminal justice system have experienced abuse and/or trauma in their pre-offending lives (Corston, 2007; Rungay, 2004).

Abuse, neglect and fear damage an individual's ability to feel that he/she belongs for a host of reasons. Miller (1986) found that disconnection led to the following outcomes: diminished zest and vitality, disempowerment, confusion and lack of clarity, diminished self-worth and a turning away from relationships. These proposed outcomes are predicted to impact on the woman's self identity. With this in mind, the victim-offender duality that characterises many female offenders is one that should not be ignored for several reasons: the extreme marginalisation associated with this group (Wacquant, 2009), the finding

that unresolved trauma worsens over time (Bill, 1998) and the proposed impact it may have on any children she may have (Delima & Vimpani, 2011). The body of evidence provides a compelling rationale for further exploration of social connectedness and contexts for re-connection. Reconnection is an important goal for the following reasons: 1) the well-being of the women, 2) the well-being of disconnected families, 3) reduced recidivism and, 4) an ethic of fairness, to punish and re-victimise the victims of abuse and trauma is unjust and yet remains common place (Corston, 2007; Hardwick, 2012; Richie, 2001).

Connecting to the natural world as a precursor to social reconnection

Offender work to date has typically been situated in what might be described as anxiety provoking situations, e.g. the probation office (Calderbank et al., 2011). High arousal is likely to negatively impact on the woman's ability to engage and perform (Diamond & Otter-Henderson, 2007). A context that may inhibit efforts made to improve social connectedness and, therefore, be unlikely to improve access to mainstream opportunities (Eliason, 2006; Steffensmeier & Allan, 1996).

Working in nature presents as a promising context for work with a female offending population (Johnson, 1999). There is evidence of success with nature based work with other populations, for example, projects that have worked with individuals with mental ill health, substance misuse and learning disability (for example, Haubenhof, Elings, Hassink, & Hine, 2010; Hine, Peacock, & Pretty, 2008). Research has demonstrated that working, or simply 'being' in nature can profoundly enhance wellbeing (Burls, 2007; Diamant & Waterhouse, 2010; Louv, 2008; Maas, Verheij, Groenewegen, De Vries & Spreeuwenberg, 2006; Nebbe, 2006; O'Brien, 2005; Stigsdotter & Grahn, 2003). Horticultural group work has also been recognised as a vehicle for social inclusion (Fieldhouse, 2003; Diamant & Waterhouse, 2010). Research to date has largely worked with vulnerable populations, for example, those with learning disabilities or mental health issues including PTSD; or young people whose developmental trajectory was deemed risky (Campbell & Wiesen, 2009; Peacock, Hine & Pretty, 2007; Pretty & Smith, 2004; Velarde, Fry & Tveit, 2007). These groups, much like female offender groups, have been found to be high on stigma and low on social intelligence. Rebeiro (2001) argued that belonging needs will only be met if the work environment is experienced as physically and emotionally safe, therapeutic horticulture and gardening projects have been suggested to offer this safe environment (Pudup, 2008; Gonzalez, Hartig, Patil, Martinsen & Kirkevold, 2011).

Feeling safe is associated with reduced arousal, and research has shown that work in nature can reduce anxiety, depression and stress and increase reported experiences of positive affect (Gonzalez et al., 2011). Gonzalez et al. (2011) found increased group cohesiveness and enhanced social skills amongst a clinically depressed cohort engaged in a 12 week therapeutic horticultural project. The reported improvements were still evident three months post project completion. This longevity offers a window of opportunity for further trauma related or offending related work to take place, i.e. working or being in nature itself is not proposed as a panacea, it is proposed as a possible starting point for the therapeutic journey. A starting point that might offer what Winnicott (1965) referred to as a '*facilitating environment*'. The facilitating environment refers to a potential space where the individual has an opportunity to enter an '*unintegrated*' state. This is posited to be a state of being where the individual can begin to make sense of interrelationships between themselves and the external world (Bingley, 2003).

Congruent as work in nature benefits appear to be with the identified needs of female offenders, there have been few studies exploring the efficacy of nature based community work with adult female offenders in the UK or indeed elsewhere in the world (Barry, 2008; Cammack, Waliczek, & Zajicek, 2002; O'Callaghan, Robinson, Reed, & Roof, 2009; Sempik & Aldridge, 2006). Projects have been successfully undertaken with young people in detention (Thompson, Aspinall, Bell & Findlay, 2005), adult male offenders (Broadhurst & Loh, 2003; Pretty, Griffin & Sellens, 2003; Rice & Lremy, 1998; Richards & Kafami, 1999). Fieldhouse (2003) concluded that gardening groups have two key areas of benefit, cognitive benefits associated with

enhanced mood, reduced arousal, improved concentration and reduced anxiety; and social benefits. Fieldhouse concluded that the approach is valuable because it emphasises skills and aspirations rather than symptoms and deficits. Working together in nature may also neutralise some of the social inequalities experienced in urban contexts. This flattening, when combined with the co-operative nature of the work, shifts the emphasis from 'fixing' and 'changing' the participants, to respecting, nurturing and teaching them. The combined potential for reduced arousal, enhanced well-being, improved skill level and positive social experiences coincides with the reported needs of female offenders (Covington, 2007; 2008; Richie, 2001; Rumgay, 2004).

This study explored differences between non-offending and offending females' self-reported connectedness ratings to the natural and social worlds. Three hypotheses were generated: H₍₁₎ Female offenders rate themselves as less connected to the social world than non-offenders and nature lovers. H₍₂₎ Female offenders rate themselves as less connected to the natural world than non-offenders and nature lovers. Finally it was hypothesised that there may be common factors underpinning the propensity to connect to either the natural or social worlds, so a positive correlation was anticipated between connectedness to nature and the social world. H₍₃₎ There will be a positive correlation between nature and social connectedness ratings.

Method

Design

A questionnaire survey design comparing three groups of adult female participants on two constructs: connectedness to nature and social connectedness was undertaken.

Sample

The sampling strategy was purposive and responses were gathered from 630 females (self reported offenders, $n=130$; self reported non-offenders, $n=310$; and nature lovers, $n=190$). All nature lovers self-reported as non-offenders. Nature lovers were distinguished from other non-offenders by their membership of nature endorsing organisations. Nature lovers were selected as a comparison group because it seemed reasonable to assume that individuals who subscribed to nature endorsing organisations may exhibit greater levels of connectedness to nature than those who do not.

Ages ranged from 18 to 72 years. 68% of the sample was aged between 18 and 35 years. Participating organisations requested and were assured anonymity. Three of the organisations worked directly with female offenders. Six organisations, who worked with adults from a broad range of socio-economic and educational backgrounds, were approached to gather data from non-offending females. No matching was attempted and the authors acknowledged that 500 is a relatively modest sample of non-offending females given the reach of the organisations. Organisations were sent the link once and this was followed by a reminder one week later to organisations who had not confirmed receipt and circulation within the interim period. All organisations confirmed distribution following the reminder.

Measures

The data collection tool was an e-survey that included three sections: 1) a demographic section that included questions on: age, qualification level, residential location (village, small town, large town, city, other) and outside space available at home residence (garden, backyard, no outside space, other); 2) a connectedness to nature scale (adapted from Mayer & Frantz, 2004); and, 3) a social connectedness scale (adapted with permission from Lee et al., 2001; Lee et al., 2008).

Social connectedness Scale. Permission was obtained to use and revise the SCS-R questionnaire (Lee et al., 2001). The wording of a couple of the items was viewed by the research team as too abstract and there were concerns that this may negatively impact on participants engagement with the scale, e.g. *I am in tune with the world* and two items in particular were problematic, e.g. *I don't feel related to most people* and *my friends feel like family*. Social connectedness in the current context needed to differentiate between friends and close family and the mainstream social world. It was the interdependent self construct that was of most relevance to this research. Revisions were made and items re-examined for validity, coherence and internal reliability. 12 items were retained but reframed in order to balance the positive and negatively worded items. Pilot testing revealed a Cronbach's alpha of ($n = 80$, $\alpha = .78$) on the revised scale demonstrating acceptable internal reliability.

The final 12 item scale (adapted from Lee et al., 2001) measured a psychological sense of belonging to the social world. The revised measure included six positively worded items (e.g. *I am comfortable meeting new people*) and six negatively worded items (e.g. *I don't usually join in with groups*). The measure used a six point rating scale (1=strongly disagree to 6=strongly agree).

Connectedness to Nature Scale. Mayer and Frantz's (2004) original scale was adapted in a similar vein to the SCS-R. There were concerns over engagement where questions lacked tangible referents or involved highly abstract concepts, for example, *I feel that all inhabitants on earth, human and non-human, share a common life force* and *I often feel a sense of oneness with the natural world around me*. The revised scale was pilot tested on a convenience sample of 80 participants, 26 with an offending history and 54 without. Items were re-examined for coherence and internal reliability. 11 items were retained but reframed in order to balance the positively and negatively worded items. Pilot testing revealed a Cronbach's alpha of ($n=80$, $\alpha = .915$).

The final 11 item scale measured connectedness to nature. Nature was broadly defined as follows: Going for walks in the countryside, parks (in cities and rural areas), forests, woodlands, coastal walks etc.; Gardening at home or as part of a project/community sentence/volunteering; Conservation work (perhaps voluntary work with organizations such as BTCV, The National Trust, etc); Outdoor sporting activities - anything from golfing to rowing, football to basketball; Extreme wilderness activities (for example, kayaking, climbing, snowboarding, skiing); Camping; and, Organized outdoor activities with clubs/ organizations or simply outdoor activities like walking the dog. It didn't include, for example, someone who lives in a town or a city walking to the shops.

The revised measure included six positively worded items (e.g. *When surrounded by nature I get calmer*. *Being in nature makes me feel free of my daily worries*) and five negatively worded items (e.g. *I find being in nature boring*. *When I am in a natural setting I think and worry too much*). The measure used a six point rating scale (1=strongly disagree to 6=strongly agree).

Procedure

This study was reviewed and approved by the University of Cumbria Ethics Committee (April, 2010). The NGOs working alongside female offenders also approved the research prior to any data being collected. All participants were assured that their data would be held securely in line with the Data Protection Act (1998).

Project documentation made it clear that participation was entirely optional and there were no incentives for participation. Organisations agreed to circulate the e-version to their contacts. The e-survey was created using Bristol Online Surveys whose data protection policy supports anonymity "*All data collected in this survey will be held securely. Cookies, personal data stored by your Web browser, are not used in this survey.*" No names or contact details were recorded and participants were clearly alerted to the fact that once

submitted data could not be retrieved. However, participants were prompted to generate and record their own personal identification code for later withdrawal purposes. The researcher could then be emailed with that code and request their data be removed from the data set.

Analytic procedure

The questionnaire was designed to produce overall scores for the social and nature connectedness scales. The social connectedness score had a maximum score of 72 and a minimum score was 12. The nature connectedness scale had a maximum score of 66 and a minimum score of 11. Descriptive analysis of the data produced means, standard deviations and reliability coefficients for the three groups: offender, non-offender and nature lover. To assess hypotheses (1) and (2) inferential tests of difference (ANOVA) were employed to examine differences in the means scores for social and natural connectedness across the three groups. To assess H₍₃₎ a correlation analysis was undertaken to examine the strength and direction of the relationship between nature and social connectedness.

Common Method Variance as a source of bias. Common method variance (CMV) was considered a potential source of bias. For research where two scales of a similar style are being used to examine constructs that are then correlated, concerns have been raised that any observed correlation may be an artefact of measurement error (measurement style), as opposed to being attributable to the construct of interest (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). To examine CMV, Harman's one factor test was applied using a principal components analysis: in theory if common method variance accounts for the data then a single factor should emerge. The un-rotated principal component factor analysis revealed the presence of three distinct factors with eigenvalues greater than 1.0, rather than a single factor. The first three factors together accounted for 62 percent of the total variance; the first (largest) factor accounted for a majority of the variance (34%) and the second factor accounted for 23% of the variance. On closer inspection, social connectedness items were loaded on Factor one and nature connectedness items on Factor two (see Table 1). No single general factor was apparent. This suggests that common method variance bias does not account for the majority of the variance explained. The potential impact of CMV was further countered by the inclusion of a qualitative measure, the purpose of which was to increase explanatory power.

Results

The initial analysis revealed differences in the means for social and natural connectedness between the offender, nature lovers and non-offender groups. The offenders self rated as less socially connected and less connected to nature than the non-offenders and nature lovers. The nature lovers had higher mean scores than offenders or non-offenders for both connectedness to nature and social connectedness. Means and standard deviations are tabulated in Table 2.

Social Connectedness

The magnitude of the difference was examined using one-way ANOVA. The homogeneity of variance assumption was violated; therefore, Welch's *F* Ratio was reported. Group membership (offender, non-offender, nature lover) did have a significant effect upon the social connectedness score ($F(2, 313) = 33.49, p < .001$). Hochberg's post hoc comparisons (for unequal sample sizes) for the three groups indicated that the offender group self rated as lower on social connectedness ($M = 39.61, 95\% \text{ CI } [37.27, 41.94]$) than either the non-offender ($M = 48.16, 95\% \text{ CI } [46.84, 49.48]$), $p < .001$) or the nature lover group ($M = 50.78, 95\% \text{ CI } [49.43, 52.14]$, $p < .001$). Comparisons between the non-offender and nature lover group revealed that nature lovers reported higher levels of social connection than non-offenders ($p < .001$).

Table 1. Harman's one factor diagnosis of common method variance

		Rotated Component Matrix [†]		
		Component		
Variable	Item	1	2	3
Connectedness to Nature	1	.233	.411	.429
	2	.107	.733	.285
	3	.262	.355	-.290
	4	.030	.737	-.081
	5	.087	.764	-.165
	6	.039	.704	.311
	7	.027	.868	.038
	8	.044	.813	-.111
	9	.071	.753	-.002
	10	.065	.851	.045
	11	.038	.597	.440
Connectedness to the social world	1	.677	.115	-.206
	2	.802	.161	-.097
	3	.645	.185	-.187
	4	.705	.203	-.002
	5	.820	.078	-.075
	6	.768	.037	.099
	7	.804	.010	.011
	8	.758	-.005	-.007
	9	.823	.044	.060
	10	.803	-.001	.235
	11	.733	-.007	.367
	12	.770	.001	.309

[†]Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

^{††}All items from each construct are reported above.

Table 2. Means and standard deviations (SD) by group (female offenders, nature lovers and non-offenders)

Scale	Group	n	Means	SD
Social Connectedness	Offenders	130	39.61	13.45
	Non-Offenders	310	48.16	11.80
	Nature lovers	190	50.78	9.50
Connectedness to Nature	Offenders	130	42.48	8.91
	Non-Offenders	310	47.10	9.51
	Nature lovers	190	55.41	6.61

Compared to the offender group, social connectedness in the non-offender group was about two thirds of a standard deviation higher, $d = .68$, a medium effect and nearly one standard deviation higher in the nature lovers group, $d = .97$, a large effect. The nature lovers had social connectedness scores of a quarter of a standard deviation higher than the non-offenders $d = .25$, a small effect. With respect to social connectedness, the non-offenders and nature lovers mean scores were closer to one another than they were to those of the offender group. The results revealed support for the first hypothesis: female offenders did report as less connected to the social world than either of the non-offending comparison groups.

Nature connectedness

The magnitude of the difference was examined using one-way ANOVA. The homogeneity of variance assumption was violated; therefore, Welch's F Ratio is reported. Group membership (offender, non-offender, nature lover) did have a significant effect upon the nature connectedness score ($F(2, 327) = 124.03, p < .001$).

Hochberg's post hoc comparisons (for unequal sample sizes) for the three groups indicated that the offender group self rated as lower on nature connectedness than either the non-offender ($M = 47.10, 95\% \text{ CI } [43.03, 48.16], p < .001$) or the nature lover group ($M = 55.41, 95\% \text{ CI } [54.46, 56.36], p < .001$), the nature lovers and non-offenders ratings also differed, with nature lovers self reporting as most connected to nature ($M = 4.43, 95\% \text{ CI } [3.80, 5.06], p < .001$). Hypothesis two was supported: female offenders did report as less connected to nature than the other two non-offending groups.

Compared to the offender group, nature connectedness in the non-offender group was half a standard deviation higher, $d = .50$, a medium effect and more than one and a half standard deviations higher in the nature lovers group, $d = 1.67$, a large effect. The nature lovers had nature connectedness scores of about one standard deviation higher than the non-offenders $d = 1.03$, again revealing a large effect. With respect to nature connectedness the offenders and non-offenders mean scores were closer to one another than they were to those of the nature lover group.

Relationship between natural and social connectedness

The third hypothesis was examined using spearman's correlation analysis. A significant positive correlation was revealed between connectedness to nature and social connectedness ($r_s(630) = .25, p < .01$), indicating that as connectedness to nature scores increased, so too did social connectedness scores. The third hypothesis was supported: connectedness to nature and social connectedness scores were positively correlated.

Discussion

These analyses revealed support for each of the three hypotheses. With respect to hypothesis one, female offenders did report as less socially connected than non-offenders and nature lovers, a finding that concurs with a substantial body of research (Geltsthorpe & Sharpe, 2006; Geltsthorpe et al., 2007; Richie, 2001; Rungay, 2004). Previous research, however, typically examined social exclusion, i.e. the extent to which an individual's access is blocked to a variety of goods and services (Levitas, 2007). In contrast this study focused on the *psychological experience of exclusion* (Lee & Robbins, 1998), or how connected to other members and groups in society the women reported feeling. Social connectedness is a phenomenological construct exploring how exclusion is experienced, as opposed to the reality of exclusion in any corporeal sense. Participants were explicitly asked to reflect on broader social relationships beyond family and close friends, in order to focus on social connections as opposed to more intimate ones. The existent body of literature confirmed that female offenders are amongst the most socially excluded members of contemporary society (Corston, 2007; Rungay, 2004) and so any remediation would benefit from a focus on inclusion and reconnection.

If social exclusion was solely an issue of structural injustice, then an injection of financial support would apparently offer the most expedient solution. Access to services could be purchased, reinstated. This line of argument is of course naïve and assumes that the aspects of society presently denied to female offenders are both tangible and for sale. The results from this study acknowledged that structural inequality offers a partial explanation and so supports Farrell, Bottoms, & Shapland's (2010) claim that it is the interaction between structural and agentic factors that require attention if desistance from crime is to be supported. A view explicated further by Mouzelis (2008). Mouzelis's critical argument, for the purpose of this discussion, was

that social structures are not simply institutional rules/regimes devoid of actors and pervasive social norms, offenders may have relationships with institutional representatives and they may also have perceptions of the institutions and their values. This point is critical because structural inequality and exclusion implies a passive relationship, where an individual is explicitly blocked. Mouzelis's account appreciates the psychological dimension, the complex interaction between structures, the self and identity. Therefore in work with female offenders who are excluded, remediation is about psychological as well as literal reconnection.

The research findings reported here suggest that the social exclusion observed in previous studies co-occurs with psychological disconnection in this group. Alongside social injustice the psychological component deserves further examination. Women in this group reported themselves to be less connected than their non-offending peers, a disconnection that may be reflective of the victimisation many of the women in this population have experienced at the hands of others. Low social connection is atypical; granted, people vary enormously on the number and range of their social connections but social connection as a human need is argued to be fundamental and inherent (Maslow, 1970; Kohut, 1984). This study did not explicitly ask for information on victimisation experiences. The data collection process was anonymous but remote questioning on what may be harrowing personal experiences was considered unethical and unnecessarily intrusive given the plethora of evidence suggesting victimisation rates of between 60 and 80% amongst the female offending population (e.g. Bloom et al., 2003; Corston, 2007; Rungay, 2004; Social Exclusion Task Force, 2009). It is of course possible that a convenience sample of only 130 female offenders may have resulted in an unrepresentative sample, i.e. very few or all of those responding may have experienced trauma, maltreatment or victimisation. If this had been the case then factors other than victimisation and maltreatment would need to be identified and examined in order to account for the low connectedness scores amongst this group. Other factors cannot be ruled out as being responsible for the observed data and so further research exploring why social connection is lower in female offenders would be encouraged. This study can only claim that social connectedness was significantly lower in a female offending population than in a non-offending one.

The second hypothesis was formulated on the basis of previous research findings that suggested connecting to nature, being in nature and working in nature might serve as a vehicle to heal the harm many female offenders have experienced (e.g. Mashek et al., 2006; Williams & Galliher, 2006). The assumption was that if the women report as highly connected to the natural but not social worlds when compared to two sub-groups of their peers, then nature may not be a relevant context for remediation work for them despite the success found in other socially excluded groups (Sempik & Aldridge, 2006). In other words, had the women already been connected to nature then this connection had clearly not positively impacted on their experiences of the social world. However, if the women reported lower levels of connection to both the natural and social worlds than their counter-parts, then nature might, as Gonzalez et al. (2011) proposed, offer the safe environment advocated as important for social inclusion work to begin. A '*facilitating environment*' as Winnicott (1965) described, a space where an individual can begin to explore their relationships and interrelationships.

The analysis revealed group differences in connectedness to both the natural and social worlds, with the nature lovers reporting as most highly connected and the offenders as least on both measures. Consequently, research exploring levels of arousal and feelings of anxiety pre and post nature exposure might be warranted to explore this phenomenon further. Previous research suggested that high arousal and anxiety are characteristic of this group and that formal social contexts may serve to exacerbate rather than ameliorate these feelings (Calderbank et al., 2011; Patel & Stanley, 2008; Storer, 2003).

Hypothesis three predicted a positive correlation between nature connectedness and social connectedness scores. This hypothesis also received support. This finding suggested that the higher participants rated their connection to nature, the higher they rated their connection to the social world. The finding that natural and social connectedness are correlated was predicted based on research suggesting that work in nature may increase social connectivity (Burls, 2007; Diamant & Waterhouse, 2010; Maas et al., 2006; Louv, 2008; Nebbe, 2006; O'Brien, 2005; Stigsdotter & Grahn, 2003). However, low social connection does not automatically mean that individuals will feel disconnected from the natural world. Finding lower connection amongst the female offender group to either the natural or social world was consistent with the literature on exclusion. The constraints placed upon this group (financially, psychologically and socially) would be predicted to impact on their access to nature based activities, particularly given the fact that the overwhelming majority of them were based in highly urbanised communities (89%), often with no personal outside space (87%). This lack of free and safe access may inhibit connection to nature. The lack of connection may, therefore, be a side effect of social disconnection, i.e. reduced priority and poor accessibility. This relationship is not predicted to be causal, however, and may be mediated or moderated by a number of other factors; for example, psychological connection whether to nature or other people, may be mediated by arousal. It may be that when stressed and anxious, the ability to connect is impaired.

The modest relationship found between natural and social connectedness, with nature lovers reporting as most socially connected, may offer support to the argument that work in nature would increase connectedness to nature and simultaneously promote social connection in female offenders. However, the non-causal nature of this association does mean that other explanations may account for this finding. Nature lovers may, for example, possess personality characteristics or traits that make them feel more connected to the world and being in nature is simply another opportunity for connection, i.e., it may not be nature that promotes opportunities for social connection, nature may simply be another part of the world to connect to. Preparedness or readiness to connect may be an attribute. The current exploratory findings provide insufficient information to draw firm conclusions and future studies may benefit from measuring stress, anxiety and physiological arousal, alongside social and natural connectedness, to further illuminate this finding.

Exploratory research of this nature inevitably has a number of limitations, the findings provide a springboard for future research and the conclusions drawn are both tentative and partial. The findings did support previous research and theory but the methods were not sufficiently robust to make causal claims. The research drew upon research from a range of academic backgrounds using measurement tools designed for different purposes and populations. The two scales used to assess self reported connectedness were both modified with the research aims and populations of the reported study in mind. The pilot test and main study revealed acceptable reliability of the revised measures however, whether the revised scales retained their validity remains to be seen. To establish their validity tests of predictive and concurrent validity would be welcomed. The uneven sample sizes also present difficulties because, in spite of their realism in terms of real world representation, i.e. the smallest group were offenders and the largest non-offenders, the non-offending group remained modest in contrast to the other two. One of the biggest concerns faced by researchers using two questionnaire style measures is common method variance. In the current study CMV was acknowledged and the design and presentation of the measures did make efforts to ameliorate this source of bias. The factor analytic technique adopted (Harman's one factor test) to examine CMV suggested that it had not unduly impacted on the results because three factors with eigenvalue's over 1 were delineated. However, future studies may elect to adapt the scale end points to help reduce the possibility of CMV further (Podsakoff et al., 2003).

Implications and Conclusions

Female offenders did report as less connected to both the social and natural worlds than either the non-offending or nature loving groups. The analysis did reveal a significant positive correlation between connectedness to nature and social connectedness, suggesting that these two constructs are in some way related. Future research may seek to measure victimisation, stress, anxiety and physiological arousal and to conduct interviews with participants to enable the concepts of social and natural connectedness to be examined more thoroughly. Finally, additional questions on experience in nature might be helpful and enable researchers to disaggregate opportunity to connect to nature from an active choice not to participate. There are clearly methodological issues to resolve, however, given the magnitude of the differences between the groups on both connectedness constructs, future studies may seek to focus on offending women involved in work in nature and examine the women's experiences at the beginning, end and post project completion.

- Offending women report lower social connectedness than non-offending women. Reconnection may be an important target for intervention.
- Offending women report lower connectedness to nature than their non-offending counter-parts.
- The positive correlation between connectedness to nature and social connectedness may imply that interventions for female offenders may benefit from engagement with work in nature.

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