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The role of social connectedness in pro-environmental behaviours at a trait and situational level

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Abstract

This study investigated the effect of trait and situational social connectedness on participants pro-environmental behaviours (PEB). There were 90 participants split equally into two conditions, a socially included condition, used to create the feeling of social connection, and a socially excluded condition. Participants started by completing a social connectedness scale (SCS) to measure their feeling of trait social connectedness in everyday life. They then played the cyberball game on the computer which they were told was against two other participants, however it just virtual characters. In the Cyberball game participants were either included or excluded. After this they did a pro-environmental task which consisted of 20 trials where they had options to choose between a car and a bike, each with different waiting times, and they finished with a general PEB questionnaire. They were asked two questions for the manipulation check, if they had seen the cyberball game before and if they felt included in it. The results showed no significant differences between situational social connectedness compared to exclusion in pro-environmental choices. There was also no significant difference between trait social connectedness and PEB. This did not support the hypothesis that individuals higher in trait or situational social connectedness would be more environmentally friendly.

Keywords: Pro-Environmental Behaviour Task (PEBT), social connectedness, social exclusion, Cyberball, Social Connectedness Scale (SCS), psychology

Introduction

Global temperatures have seen an astonishing rise of 0.85°C from late 1800's until 2012, leading to a 19cm rise in sea levels, due to recent human activities (IPCC, 2013). This rise in temperature has detrimentally impacted the environment, a major example of this is the Australian bush fires. Over 6.3 million hectares that burned from September 2019 and were still burning as of January 2020 ("Australia bushfires: A very simple guide", 2020). All over the globe there is increasingly more severe weather that is impacting lives, such as intense rainfall events in America (USGCRP, 2017), and in Antarctica ice loss per year has tripled since 2012 ("Ramp-Up in Antarctic Ice Loss Speeds Sea Level Rise", 2020). Mother nature has always been relatively unpredictable and always changing, however, human activities and behaviours that produce greenhouse gases are a leading cause of climate change (Swim, Clayton & Howard, 2011). If human behaviour is the cause of climate change, then maybe research into what makes some individuals more pro-environmental can be used to try to improve the future behaviour of others. The focus is on more pro- environmental behaviours (PEB), PEB are classed as conscious acts that minimise the negative impact an individual can have on the natural world (Kollmuss & Agyeman, 2002).

There are many different aspects that may influence PEB. One aspect that impacts individuals' environmental behaviours is there feeling of connectedness. Feelings of connectedness with nature is positively associated with pro environmental actions (Rosa, Profice & Collado, 2018). If nature connectedness can influence people's behaviours then it may be possible for social connectedness to influence behaviours. Hargreaves (2011) suggested that behaviour change on an individual level is too narrow to cover the full impact of behaviour change. He concludes social practices may be more useful in influencing behaviour. Currently there is not much research on the topic of social connectedness and environmental behaviours, however other forms off connectedness and social influences suggest behaviours can be influenced by individuals' feelings and peers.

Hoot and Friedman (2011) hypothesised that both nature connectedness and a broader, transpersonal form of connectedness would be related to each other and to environmental behaviours. They also believed that nature relatedness would be better related to environmental behaviours. They used 4 types of scales in their study, they measured transpersonal connectedness, nature connectedness, future connectedness and environmental beliefs, they also used a 6 item questionnaire on environmental behaviours. The findings from their study show that the connectedness to nature and to the future both correlated significantly with environmental beliefs and behaviours. However, they did find that transpersonal connectedness correlated with the nature and future connectedness suggesting a common measure of interconnectedness they all produce. From their findings we can infer that transpersonal interconnectedness does not play a large role in environmental behaviours, however nature and future connectedness are relevant to how we see and treat the environment.

Similarly, a study by Barbaro and Pickett (2016) found similar patterns in regard to nature connectedness. Their study aimed to see if connectedness to nature indirectly influences the relationship between mindfulness and PEB. To do this they used a questionnaire to measure mindfulness and two scales for connectedness to nature and PEB. They found that connectedness to nature did indirectly influence the

relationship between mindfulness and PEB. From this they conclude that although mindful individuals are more pro-environmental, feeling connected to nature makes people more aware of the impact their actions have on the environment. Furthermore, it has been suggested that individual's personality type and attitudes are predictors of environmentally responsible consumption patterns (Balderjahn, 1988). An example of this is that people who have higher self-efficacy engage in more recycling behaviours and feel more intrinsically motivated (Tabernero & Hernández, 2011). Likewise, Jugert (2016) found that collective efficacy also increases PEB due to enhancing the feeling of efficacy at the individual level. This suggests that feeling effective as a group has an impact on how people feel on an individual level.

Gifford and Nilsson (2014) compared different personal and social factors that may impact environmental behaviours by looking at lots of different studies. A few of the social factors they discussed included social identity, norms, urban/rural residence and social class. They suggested that there may be certain aspects that lead to more PEB, such as being in the upper half of the economic class, hold pro-environmental norms, live in a more nature centric rural area and possibly be involved in a nature-oriented religion. Although none of these are indicators that definitely lead to increased PEB, the trends from studies about each of these factors suggest they all lead to more PEB, so combined will most likely create more responsible environmental behaviours, an example of this is shown in a study by Hinds and Sparks (2008).

Hinds and Sparks (2008) looked at individual's affective connection with the environment and their positive engagement with it. One of their hypothesis' was that individuals in a rural residence will have more affective connection and better environmental behaviours than those in an urban residence. They found that the more affective connections participants had the more positive their behaviours and attitudes towards the environment were. Similarly, they also found that participants that grew up in rural areas had more affective connections and stronger behaviours and attitudes towards the environment than those who grew up in an urban area.

Another social factor is how an individual is feeling. Research on workplace affect and environmental behaviours was carried out by Bissing-Olson, Iyer, Fielding and Zacher (2013). They hypothesised that both activated and unactivated positive affect are positively related to task-related PEB. They found that both activated and unactivated positive affect were strong predictors of task related PEB. Research has shown that it isn't only social factors such as where people grow up, impacts their behaviour. Additionally, how individuals' feelings can be impacted by other people in their lives. Barsade (2002) looked at the effect emotional contagion had on individual attitudes and group processes. He predicted that an increase in positive mood will lead to higher cooperation as a group and an individual, as well as higher ratings of task performance as an individual and a group. He found that participants experienced positive emotional contagion from the group and that in turn improved their cooperation and their perception of the task performance. These findings might be applied to environmental behaviours. If positive emotion leads to more cooperation and higher perception of task performance, then maybe it would make individuals more inclined to act pro-environmentally such as recycling.

Moreover, there has also been research into an individual's social identity and the effects it has environmental behaviours and activism. Dono, Webb and Richardson (2010) used different scales measuring; environmental activism, pro-environmental behaviour and social identity. They hypothesised that environmental behaviour would mediate the relationship between environmental activism and social identity. However, they found a significant relationship between social identity and environmental behaviours, and the relationship between social identity and environmental activism itself was indirect. Therefore, feeling socially connected to a group and taking on that groups social identity seems to significantly impact environmental behaviours.

Additionally, Cojuharenco, Cornelissen Karelaia (2016) researched how social connectedness increased perceived efficacy and influenced responsible environmental behaviours through a number of studies. One was a simple survey of self-reported social connectedness; how effective they perceive their contribution to be and their environmental consumer behaviours. The other 3 studies they manipulated the feeling of social connectedness and how that affected their perceived effectiveness, willingness to exert effort for a social cause. They found that the feeling of social connectedness increased the perceived effectiveness of an individual's own actions. Due to the increased feeling of effectiveness participants engaged in more socially responsible behaviours. From this it can be inferred that an individual's social connectedness indirectly increases PEB through improving the perceived efficacy of their own behaviours.

However, findings from Poon, Teng, Chow and Chen (2015) contradict Cojuharenco et al. (2016). Rather than looking at the effect of connectedness to others, they looked at the effect of ostracism. They did three experiments using different manipulations of ostracism, in each of their experiments they found ostracised participants reported a higher desire to connect to nature by engaging in PEB. The three manipulations they used to induce the feeling of ostracism were an imagination task, the Cyberball game and a memory task. In the imagination task they were asked to imagine they were starting an internship and being either ostracised or accepted by colleagues. The Cyberball game was an online game of catch between three people, they were informed the other two were participants, the ostracised group were only passed to two out of thirty throws. In the memory task they were asked to recall either an ostracism or physical pain memory. After each task they were asked to rate two statements as a manipulation check. All three were equally significant in manipulating the feeling of ostracism.

Furthermore, there are also a number of ways to measure PEB. One method is self-report, such as the 6-item scale used by Hoot and Friedman (2011), this method of data collection is easy and had adequate internal reliability (alpha = .65). Another way of measuring environmental behaviours is observation of participants behaviours. However, this is a time consuming method and although it may provide good descriptive analysis, it has been suggested provides a correlational relationship rather than a causal effect of an IV on participants behaviour (Sloman, 2010).

Another method of studying PEB is the Pro-Environmental Behaviour Task (PEBT) done by Lange, Steinke and Dewitte (2018). They used the PEBT to measure participants environmental behaviours and compare that with their self-reported environmental attitudes. It also measured the effect waiting time would have on

environmental behaviours. The PEBT was a computerised experiment to assess environmental behaviours. Connected to the task were blinksticks with an overall of 12 lights which they mounted beneath the desk to limit distractions. In this task participants are presented with a choice between a car and a bike, each would have different waiting times and CO^2 emissions, depending on the lights being turned on. In the waiting period the display showed the lights that would be turned on. They had 72 trials per participant in total during their experiment. Their findings showed that there was a significant decrease in environmental behaviours when the waiting times were longer. There was also a positive correlation between the self-reported environmental attitudes and the proportion of environmentally friendly choices. Lange et al. (2018) suggest the findings imply that the PEBT is a useful tool of environmental behaviours in laboratory settings. The PEBT was used in the current experiment as it has been shown to be an effective measure of pro-environmental behaviours.

Hypothesis and Rationale

Past research has shown many things can influence an individual's environmental and cooperative behaviours. These include their connectedness to the environment, how they feel, where they grow up, the emotions of others influencing their actions, the perceived efficacy of their actions and their social identity. However, there is not much research on how social connectedness directly influences an individual's environmental behaviours. Maybe feeling socially connected to others will make people more inclined to look after the world they live in. This study looks at two forms of social connectedness we define one as trait connectedness, this is the form of connectedness we feel to others in everyday life and not in a specific situation. The other form we define as situational connectedness, this is the connectedness they feel in a certain event, in this study it's the manipulation task where we induce feelings of connectedness or exclusion.

There were two hypothesis that were being measured. The first was that individuals who were in the socially included condition would make more pro-environmental choices in the PEBT than those who were socially excluded

Hypothesis two was that individuals who had a higher trait connectedness would make more pro-environmental choices on the PEBT.

Methodology

Participants

This study consisted of 90 participants (M = 15, F = 75) who were all undergraduate students from the University of Plymouth. Participants volunteered through the University participation pool and gained course credit for taking part. There were 45 participants in the social inclusion condition and 45 participants in the social exclusion condition. Participants were asked if they had any physical impairment that may impact their ability to ride a bike, which may influence their choice in the PEBT. No other demographic information was collected.

Materials

There was a brief (Appendix A) outlining the study to participants and a consent form (Appendix B) to show they were happy to take part and knew their right to withdraw at any point. There was also a debrief (Appendix C) giving more detail on the topic and contact details for the researchers should participants have any further

questions or queries. A questionnaire was used to measure individuals' feelings of social connectedness (Appendix D) which was a slightly altered version of the Social Connectedness Scale (SCS) (Lee & Robbins, 1995). The SCS contained statements such as "I feel like an outsider" to measure participants feelings of social connectedness in general using a 6-point scale (1 = strongly disagree, 6 = strongly agree), it was altered from the original version by taking out 5 questions that measured extraversion rather than social connectedness (Cronbach alpha = .899). The most recent version of the original Cyberball game (Williams, Cheung & Choi, 2000) was downloaded and ran on the computer with a Philips Brilliance LED monitor which was 21.5". There were two conditions, in the first condition participants were included in an online game of catch between three players with an overall of 30 throws between them. In the second condition there was the same number of players and throws only the participants were only passes the ball once.

To measure environmental behaviour, an altered version of the Pro-Environmental Behaviour Task (PEBT) was used, created by Lange, Steinke and Dewitte (2018), which was ran on OpenSesame version 3.2.8 (Mathôt, Schreij & Theeuwes, 2012). In this version of the PEBT there was only 20 trials rather than 72 and didn't have the lights that would turn on, it just used the picture on the screen to demonstrate this effect (Appendix F). A Pro-Environmental Behaviour (PEB) questionnaire (Appendix E), made up of eight questions, was also used to show how the participants acted on environmental matters in everyday life ("UK Household Longitudinal Study – Wave 4", 2020). The questionnaire was on a 6 point scale, however only the first 5 applied, the last was used if the statement wasn't applicable to the participant. It asked how often participants did certain activities such as "walk or cycle for short journeys less than 2 or 3 miles", 6 would be used in a case of a leg impairment meaning they cannot walk or cycle (Cronbach alpha = .11). The first question on this questionnaire asked individuals overall feeling of how environmental they believe they are. In this study there was a jug of water next to both a glass and a plastic cup, which was used as an environmental behaviour baseline measure.

Design and procedure

This study was an independent measure design, participants were randomly assigned to each condition. Firstly, participants were given the information sheet and consent form. They were then asked to pour themselves some water and it was recorded if they chose to use the glass or the plastic cup. After that they were asked to fill out the SCS. Once they completed the SCS they played the Cyberball game in either the socially included condition or the socially excluded condition. When they finished the Cyberball game they immediately started the PEBT, in this task participants were given a choice between a bike and a car, participants were told how long each journey would take (Appendix G) if either one was chosen. In each trial the bike would take longer varying from 5 seconds longer to 60 seconds longer, in every condition participant were told that choosing the car would produce 9000mg CO^2 per hour, if the car was chosen then the lights in Appendix F. would appear on the screen illustrating the pollution being produced. Lastly, they were given the PEB questionnaire to provide a more general view of their environmental behaviours. Once that was completed, they were given the debrief and asked if they had any questions about the study.

Data preparation and manipulation check

Firstly, to prepare the data the questionnaire scores were recoded, 10 items on the SCS were recoded so that a higher score indicates a higher feeling of connectedness (Appendix H). The PEB questionnaire had 6 items recoded, a higher score showing more pro-environmental behaviours (Appendix I). With the recoded data we calculated a total score for each questionnaire.

Next, a Cronbach's alpha test was conducted on both questionnaires. The SCS Cronbach α = .899 which tells us the scale has good reliability. However, the PEB questionnaire had a low score α = .11, this suggests the PEB has low reliability. Due to this we decided not to take the score of the questionnaire as a whole in our statistical analysis, instead we looked at the individual items.

Finally, a manipulation check was carried out using chi-squared. A chi-squared test indicated a significant difference in the condition's participants were in and the manipulated feeling of inclusion/exclusion, χ^2 (1, N = 90) = 44.93, $p < .001$. This suggests most participants were manipulated to feel included or excluded, however 14 participants' feelings of inclusion were incongruent with the condition they were in (as shown in Table 1.).

Table 1: Results of chi-squared test run on manipulation check to see if manipulation of inclusion and exclusion was successful.

	Manipulation check		
Condition	**Feeling Included**	**Feeling Excluded**	**Total**
Included	33	12	45
Excluded	2	43	45
Total	35	55	90

Results

Hypothesis Testing

Firstly, an independent sample t-test was conducted on the SCS score to check it was the same across conditions, and that random assignment was successful. There was no significant difference between the included (M = 65.2; SD = 10.62) and excluded condition (M = 69.18; SD = 12.22), $t(88) = 1.39$, $p = .168$ (equal variances assumed).

An independent samples t-test was then used determine whether those in the socially connected condition were more pro-environmental in the PEBT than those in the socially excluded condition. One participant's PEBT data was not collected so they were excluded from the *t*-test analysis. The test showed that the socially included participants (M = 54.66; SD = 24.79) were not significantly more pro-environmental than the socially excluded participants (M = 60; SD = 22.71), $t(87) = 1.06$, $p = .292$ (equal variances assumed).

For the PEB question measuring participants overall feelings of their environmental behaviours an independent samples t-test was used. This test also showed no significance of pro-environmental behaviours between the socially included participants (M = 2.96, SD = .64) and the socially excluded participants (M = 3, SD = .77), $t(88) = .30$, $p = .766$ (equal variances assumed).

As the Cronbach alpha was very low for the PEB questionnaire an independent samples t-test was ran on each question, instead of the total, to look for any significance for individual items. No item on the questionnaire had any significance, the values for the t-test are shown in Table 2.

Table 2: Means and independent samples t-test values of responses for the PEBT and the PEB questionnaire for both conditions with all participants.

		Included Condition	**Excluded Condition**	***t***	***df***
	PEBT Total	54.66 (24.79)	60 (22.71)	1.06	87
	PEB Overall Question	2.96 (.64)	3 (.77)	.30	88
PEB Questions	1	3.65 (1.13)	3.82 (1.03)	.78	88
	2	4.38 (1.42)	4.31 (1.31)	.23	88
	3	4.40 (.84)	4.42 (.78)	.13	88
	4	4.44 (1.20)	4.38 (1.10)	.28	88
	5	3.69 (1.00)	3.53 (.87)	.79	88
	6	2.29 (.87)	2.48 (1.07)	.91	87
	7	2.87 (1.14)	3.20 (1.05)	1.46	87
	8	4.6 (.54)	4.47 (.94)	.82	69.96

Due to the original t-test showing no significance a second independent samples t-test was conducted to determine whether removing the data of the participants who were in a condition incongruent to their reported feeling of inclusion/exclusion increased significance. Using the results from the manipulation check 14 participants data was removed from the t-test. The test for the PEBT showed that the socially connected participants (M= 56.36; SD = 25.38) were still not significantly more pro-environmental than the socially excluded participants (M = 59.30; SD = 22.90), $t(74) = 0.53$, $p = 0.529$ (equal variance was assumed).

The independent t-test with 14 participants data removed was also ran for the overall PEB question and the PEB questionnaire. For the overall PEB question there was no significance between participants in the socially included condition (M = 3, SD = .61) and the participants in the socially excluded condition (M = 3, SD = .79), $t(74) = 0.00$, $p = 1.00$ (equal variance was assumed).

Similar to the first independent sample t-test, the repeated independent samples t-test that removed the data of the 14 participants also showed no significance for any of the items on the PEB questionnaire. The values from the test can be seen in Table 3.

Table 3: Means and independent samples t-test values of responses for the PEBT and the PEB questionnaire for both conditions without participants that were excluded due to the manipulation test.

		Included Condition	Excluded Condition	*t*	*df*
	PEBT Total	56.36 (25.38)	59.30 (22.90)	.53	74
	PEB Overall Question	3.00 (.61)	3.00 (.79)	.00	74
PEB Questions	1	3.58 (1.23)	3.81 (1.05)	.91	74
	2	4.39 (1.46)	4.35 (1.29)	.14	74
	3	4.36 (.93)	4.40 (.79)	.16	74
	4	4.33 (1.32)	4.35 (1.11)	.06	74
	5	3.64 (.96)	3.51 (.86)	.60	74
	6	2.24 (.87)	2.45 (1.09)	.91	73
	7	3.09 (1.10)	3.19 (1.06)	.40	73
	8	4.55 (.56)	4.44 (.96)	.55	74

To test our second hypothesis a one-tailed Pearson correlation was conducted to determine whether there is a relationship between trait social connectedness and PEBT scores. Results of the test indicated that there was not a significant positive correlation between trait social connectedness on the SCS and PEBT scores, $r(87) = .042$, $p = .348$.

The one-tailed Pearson correlation was also conducted between the SCS and the items on the PEB questionnaire to determine whether there is a relationship between trait social connectedness and participants self-report of their behaviours. Results of the test indicated that there was not a significant positive correlation between trait social connectedness and 6 of the 8 items on the questionnaire. Two of the items were moderately positively correlated, the items were item 7, $r(87) = .18$, $p = .049$, and item 8 $r(87) = .20$, $p = .030$. The correlations for the PEB questions that were not significant can be seen in Table 4.

Exploratory analysis

Since no significant results were found testing the hypotheses of this study a further analysis was conducted which explored the difference between high and low trait connectedness and PEB. The median of the SCS results was 70.5, for this reason participants with a result above 70 were classed as high trait connectedness and any below were classed as low trait connectedness. The SCS score was split into high and low categories in order to make it comparable to the original correlational analysis of the social connectedness scores on PEB.

Table 4: One-tailed correlation results between SCS questionnaire and PEBT and PEB questionnaire results.

				PEB Questions							
		PEBT Total	**PEB Overall Question**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
SCS Total	Pearson Correlation	-.042	-.036	-.033	.121	.115	.036	-.051	.106	.176	.20
	Significance (one-tailed)	.35	.37	.38	.13	.14	.37	.32	.16	.049	.030

A one-way between subject's ANOVA was conducted to compare the effect of low and high trait connectedness on the PEBT. There was no significant difference between the conditions and the PEBT results, $F(1, 87) = .003$, $p = .960$.

A one-way between subject's ANOVA was also conducted to test the effect of low and high trait connectedness on participants self-report of their overall PEB. There was no significant difference between the conditions and the overall PEB scores, $F(1, 88) = .329$, $p = .568$.

Table 5: Mean and standard deviation of PEBT and Overall PEB scores for low and high trait connectedness.

	Low Trait Connectedness	High Trait Connectedness
PEBT	57.5 (23.15)	57.2 (24.52)
Overall PEB	3.02 (.61)	2.94 (.78)

Discussion

This study tested the effect of social connectedness on individuals' pro-environmental choices. The findings showed no significant difference between participants that were either socially included or excluded and their PEB. Similarly, when the data of participants who were not manipulated by the Cyberball into feeling included or excluded was removed, there was still no significant difference in pro-

environmental choices in the PEBT. This did not support the hypothesis that a situational feeling of social connectedness would increase pro-environmental behaviours. The results of the correlational analysis showed no significant relationship between participants trait connectedness in everyday life and their pro-environmental behaviours. This refutes the second hypothesis that trait connectedness, in everyday life, would improve participants pro-environmental behaviours.

Furthermore, since the hypothesis testing showed no significant results an exploratory analysis was conducted to further investigate the data from this study. This analysis was to explore the second hypothesis in more depth than the original correlational relationship. It explored the idea that participants with a high trait connectedness might be more pro-environmental than participants with low trait connectedness. Participants were divided into high and low trait connectedness based on their SCS score. The findings of this exploratory analysis also showed no significant difference between participants with low or high trait connectedness and their pro-environmental behaviours and choices in the PEBT.

A possible limitation in this study may be the use of Cyberball to manipulate a feeling of social connectedness. As shown in the manipulation test, 27% of participants in the included condition did not feel included. For this reason, it may not be an adequate manipulation of social connectedness. In previous studies such as Wesselmann and Williams (2013) Cyberball is often used to measure the effects of ostracism, exclusion and rejection. Conversely, it may not effectively create a strong enough sense of inclusion, and social connectedness, that may be needed to influence behaviours.

Moreover, the use of social contact might create a more intense and affective feeling of connectedness than a virtual computer game. Research by Aron, Melinat, Aron, Vallone and Bator (1997) into interpersonal closeness has found that the use of self-disclosure questions was an effective method to create feelings of closeness with a stranger. The disclosure questions they used increased with intensity, after 45 minutes participants rated the closeness to their partner to be higher than participants in the control group asking small talk questions. In the closeness group they also rated their closeness to be as high as the average relationship in their lives and 30% rated it higher than their closest relationship. This method of creating a closeness between strangers may be more effective at creating a feeling of situational social connectedness and in turn influence more positive PEB. It may also have more ecological validity as social connections with family and friends are created face-to-face rather than on computer games.

Another possible limitation to the current study is the use of the PEBT that was altered to the original version. In the original task ran by Lange et al. (2018) was 72 trials and used USB powered lights so that the choice the participants made had true consequences to the environment. The present study only used 20 trials and, although it stated the energy that would be used by lights, there was no true consequences. A picture of the lights were shown to represent the environmentally unfriendly choice, but may not have been a true enough representation to impact participants choices.

In a review of the original PEBT it is discussed as displaying true PEB depending on the option chosen by participants, and the trade-off participants show between their personal consequences for environmental ones (Lange & Dewitte, 2019). In the review it is also mentioned that the task can be easily adapted to many research questions. However, the limitations discussed by Lange and Dewitte included that the consequences to the task were negligible and that the personal consequences may not be accurately represented so the findings cannot be generalised to a larger context. The same may be applied to this current study as the choices had no true consequence so may not be true to participants pro-environmental behaviour in everyday life.

Conversely, another reason no significant results were found may be because the opposite effect is true, the view that ostracism could increase pro environmental behaviours. Findings from Poon et al. (2015) showed that the ostracised group of participants seeked a connection to nature more than the non-ostracised group and were more willing to behave in ecological behaviour. They suggest that it can be inferred from their findings that the feeling of ostracism leads individuals to desire a connection to nature and they do this through their behaviour towards the environment.

Additionally, Poon et al.'s (2015) findings of nature connectedness leading to ecological behaviours is supported by other research (Barbaro & Pickett, 2016; Hoot & Friedman, 2011). Their findings with regard to ostracism may provide a clearer explanation as to why the individuals in past nature connectedness studies had the desire and capability's that allowed them to connect to nature. A study by Gosling and Williams (2010) showed nature connectedness lead to an increase in conservation behaviours and suggested that an emotional connection to nature creates an expanded sense of self. This expansion in an individual's sense of self might explain why ostracised individuals desire a connection to nature, whereas individuals who have that feeling of social connectedness may not desire the feeling of the expanded sense of self.

As discussed before social identity has also been another topic of research with pro-environmental behaviour. Social identity is very similar to social connectedness; however, it is more specific to connecting with a certain group rather than just people in general. Some research into social identity has shown a significant relationship between social identity and environmental behaviours (Dono et al., 2010). Although, research by Prati, Albanesi and Pietrantoni (2017) suggests that despite social identity influencing environmental attitudes, social identity and environmental attitudes do not predict pro environmental behaviours. These findings are similar to the ones in this study that found no significant effect of social connectedness on pro environmental behaviours. Further research is necessary in both social identity and social connectedness to find out if there is any true impact in pro environmental behaviours.

A possible suggestion of further research could be using different tasks to create a feeling of social connectedness and comparing them all, similar to Poon et al. (2015) in their study into ostracism. These tasks could be using the self-disclosure questions with a stranger from the study by Aron et al. (1997). Another way that feelings of social connectedness might be induced is through a memory or imagination task, such as remembering a time in life where participants felt

connected with others or imagining a scenario where they feel connected. An imagination task maybe better in the case where participants have low trait social connectedness. Similarly, further research could be conducted with observation of pro environmental behaviours rather that the use of the PEBT. Although the PEBT is a good measure for participants behavioural choices, an observation of behaviour in the real world could be a more valid measure of pro-environmental behaviours.

Conclusions

Overall, the current study did not find a significant relationship between social connectedness and environmental behaviours, however further research is required to determine if this is true in all cases. As research by Cojuharenco et al. (2016) has shown, social connectedness creates a feeling of perceived efficacy which increases pro-environmental behaviours. Similar support has been found that shows higher self-efficacy leads to individuals displaying more recycling behaviours (Tabernero & Hernández, 2011). There also may be a difference with different methods of creating feelings of social connectedness and the impact they cause on pro environmental behaviours. If there is an effect of social connectedness and individuals' behaviours then it maybe it can be applied in schools or the workplace to try and improve environmental practices among peers.

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