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Distinguishing between self-control and perceived control over the environment to understand disadvantaged neighbourhood health and lifestyle outcomes

Marleen Gillebaart and Denise T. D. De Ridder

Social, Health, and Organisational Psychology, Utrecht University, Utrecht, The Netherlands

ABSTRACT

Objective: The current study aimed to test whether and how self-control and perceived control play a role in health outcomes and lifestyle differences between disadvantaged and non-disadvantaged neighbourhoods.

Design: Cross-sectional survey data including demographics was collected from 3758 participants. Main outcome measures: With the survey, self-control, perceived control, health status and lifestyle variables were assessed.

Results: Participants in disadvantaged neighbourhoods reported poorer general health, as well as unhealthier lifestyles compared to participants in non-disadvantaged neighbourhoods. Self-control was likewise positively associated with health and lifestyle variables. However, self-control did not differ between participants from different neighbourhoods. Perceived control over the environment mediated between type of neighbourhood and health, with participants from a disadvantaged neighbourhood reporting a lower sense of perceived control, which in turn was associated with poorer self-reported general health and less healthy lifestyle choices.

Conclusion: This reveals that perceived control over one's life and the environment is more important than self-control when explaining health differences between neighbourhoods.

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Self-control; perceived control; sense of mastery; neighbourhood; health; wellbeing

People's health is affected by the neighbourhoods they live in. These neighbourhoods differ greatly in terms of the different resources inhabitants have access to. Some neighbourhoods are *disadvantaged*: neighbourhoods with lower human, social and financial capital compared to non-disadvantaged neighbourhoods (Taylor, Repetti, & Seeman, 1997). Socio-economic features of neighbourhoods have been linked to general health, mortality, chronic conditions and health behaviours (e.g., Adler et al., 1994; Robert Wood Johnson Foundation, 2008; Sampson, Morenoff, & Gannon-Rowley, 2002; Pickett & Pearl, 2001; Robert, 1999; Yen & Syme, 1999; Winkleby, Cubbin, & Ahn, 2006).

CONTACT Marleen Gillebaart  M.Gillebaart@uu.nl  Social, Health, and Organisational Psychology, Utrecht University, Heidelberglaan 1, 3584CS Utrecht, The Netherlands.

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There have been numerous calls to action regarding health promotion and disease prevention in disadvantaged neighbourhoods specifically, emphasising that in order to promote health, we need to focus on the individual as well as their physical and social environment (e.g., Diez-Roux, 2001; Hood, 2005; Oakes & Rossi, 2003; Robert Wood Johnson Foundation, 2008). In the current study, aspects of *control*, either over the self or the environment, will be considered as a meaningful part of the association between neighbourhood and health status.

Self-control is highly relevant when discussing health improvement, regardless of target population. Self-control refers to the ability to inhibit impulsive behaviour and engage in behaviour in line with long-term goals (Fujita, 2011; Tangney, Baumeister, & Boone, 2004). Self-control is associated with physical and mental health, wellbeing, satisfaction with life and happiness (Cheung, Gillebaart, Kroese, & De Ridder, 2014; De Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012; Hofmann, Luhmann, Fisher, Vohs, & Baumeister, 2014; Miller, Barnes, & Beaver, 2011; Moffitt et al., 2011; Tangney et al., 2004). Importantly, these associations go beyond mere correlations: longitudinal studies show that childhood self-control predicts health later in life (Miller et al., 2011; Moffitt et al., 2011).

People from disadvantaged neighbourhoods may not have the same opportunities and resources for developing their self-control ability as people in non-disadvantaged neighbourhoods. As a result, differences in health and wellbeing between neighbourhoods may be due to differences in self-control. However, studies linking differences in neighbourhood status to differences in self-control have yet to produce clear-cut results. For example, Gibson, Sullivan, Jones, and Piquero (2009) demonstrated self-control differences between neighbourhoods, although neighbourhood as a factor only accounted for a small part of the total variance in self-control. Pratt, Turner, and Piquero (2004) concluded that the extent to which a neighbourhood was disadvantaged actually did predict self-control levels, whereas Gibson (2011) concluded that although self-control levels were lower in disadvantaged neighbourhoods, self-control's effect on (criminal) behaviour is actually smaller than in non-disadvantaged neighbourhoods. These and other studies demonstrate that neighbourhoods and self-control levels can be associated, but that neither the results nor the consequences of this association are straightforward.

The current lack of consensus on self-control calls for an alternative approach: Self-control may in fact *not* differ as a function of neighbourhood. However, due to the socio-economic as well as physical landscape of a disadvantaged neighbourhood (e.g., few financial resources, lack of healthy options), self-control alone may simply not be enough to foster positive health outcomes (Macintyre, Maciver, & Sooman, 1993; Taylor et al., 1997). In fact, the perceived control that people have over their own lives and their environment (i.e., sense of mastery; Pearlin & Schooler, 1978) may be more important than the ability to inhibit impulses for people living in suboptimal circumstances. Perceived control refers to the extent to which an individual thinks their chances in life to be under their own control, as opposed to being determined by other factors, like their environment (Pearlin & Schooler, 1978). Perceived control has been associated with several health outcomes (e.g., Bobak, Pikhart, Hertzman, Rose, & Marmot, 1998; Rodin, 1986), and has also been considered in the context of neighbourhoods and wellbeing (Robert, 1999). It seems to play a mediating role in these

contexts, for example explaining associations between deprivation and health (Bailis, Segall, Mahon, Chipperfield, & Dunn, 2001; Bobak, Pikhart, Rose, Hertzman, & Marmot, 2000; Bosma, Schrijvers, & Mackenbach, 1999; Gallo, De los Monteros, & Shivpuri, 2009), as well as moderating social class differences in health and wellbeing (Lachman & Weaver, 1998). However, research in which self-control and perceived control are both investigated in relation to health outcomes is lacking.

In the current study, we aimed to test whether and how self-control and perceived control play a role in health outcomes and lifestyle differences between disadvantaged and non-disadvantaged neighbourhoods. It was hypothesised that, in line with previous findings, health outcomes and lifestyle variables would be of lower quality in disadvantaged compared to non-disadvantaged neighbourhoods. Similarly, it was hypothesised that health outcomes and lifestyle variables would be of lower quality for lower compared to higher levels of self-control. The existing literature does not offer an unequivocal conclusion yet about the role of self-control and perceived control. Based on the well-established association between self-control and health (behaviours) one could predict that lower self-control levels in disadvantaged neighbourhoods would play a mediating part in the association between neighbourhood and health outcomes (i.e., self-reported general health and emotional wellbeing) and lifestyle variables (i.e., BMI, tobacco and alcohol use, diet). However, the inconsistencies in studies on neighbourhood and self-control lead us to hypothesise that self-control is of subordinate importance when compared to perceived control in health differences between neighbourhoods, and that perceived control over the environment mediates between neighbourhood and health.

Methods

Participants and design

Data collection took place as part of a 2012 health survey carried out by the municipal health services of the city of Utrecht (The Netherlands). This survey consists of questionnaires on physical and mental health as well as on health behaviours and a range of demographic variables. Below, we discuss the measures that are relevant to our research question, but note that this is not an exhaustive description of the entire survey. A total number of 7800 adult inhabitants of the city of Utrecht were invited to partake in the health survey.

Procedure

Participants were recruited in four phases. First, a letter was sent out inviting people to fill in the survey online using a personal login code. Two weeks later, a paper version of the survey accompanied by the original login code was sent out to non-responders. Another two weeks later, non-responders were sent the login code again, and those over 65 years of age were again sent the paper version of the survey. The fourth approach combined a personal approach targeted specifically at participants in disadvantaged neighbourhoods as well as at Turkish and Moroccans inhabitants, involving personal contact via a phone call or house visit, with a final mailing of the paper version of the survey to other participants.

Materials

Demographics

Demographic variables included questions about gender, age, and length/height from which Body Mass Index could be calculated. Level of education was categorised as low (secondary and/or vocational education) or high (college and/or university education). As a measure of income, participants were asked whether they had trouble paying their bills, and their responses were coded as yes, no, or missing.

Neighbourhood

Participants indicated their zip code, by which their neighbourhood could be determined. Their neighbourhood was coded to be a disadvantaged neighbourhood or not. Neighbourhoods were considered disadvantaged when there were known problems with educational drop-out, unemployment rates, criminality, lack of integration of newcomers, or a limited environment in terms of housing and living, as registered by the municipality. The municipality provided this information based on standardised procedures in large cities to determine the extent to which neighbourhoods are (dis-)advantaged (Wittebrood & Permentier, 2011).

Health outcomes

Self-reported general health. The level of experienced general health was assessed by one question ('In general, how is your health?') that was answered on a 5-point scale ranging from 1 (very bad) to 5 (very good) after recoding. Due to the fact that this was a one-item measure, no other psychometric properties were available to report.

Emotional wellbeing. Emotional wellbeing was assessed by the emotional wellbeing subscale of the Mental Health Continuum-Short Form (MHC-SF; Keyes, 2005; Keyes et al., 2008). The MHC-SF has demonstrated high internal reliability (Cronbach's $\alpha = .89$). The emotional wellbeing subscale also demonstrated high internal reliability ($\alpha = .83$). Furthermore, both the total scale as well as the subscale are considered stable over time and valid measures of the targeted constructs (Lamers, Westerhof, Bohlmeijer, Ten Klooster, & Keyes, 2011). The emotional wellbeing subscale was administered by asking people to rate how often in the past month they felt happy, interested in life and satisfied. These three items were rated on a scale from 1 (never) to 5 (every day). Emotional wellbeing was calculated by averaging scores on the three items. Cronbach's α was .89 in the current sample, demonstrating high internal consistency.

Lifestyle variables

Diet. Participants were asked how many days a week they ate cooked vegetables (ranging from 0 to 7), raw vegetables or salad (ranging from 0 to 7), and fruit (ranging from 0 to 7). These items were analyzed separately, and not combined into one scale.

Alcohol and tobacco. Participants were asked how many units of alcohol they consumed per week (open question), and how many cigarettes they smoked per day (open question). These items were analyzed separately, and not combined into one scale.

Control measures.

Self-control. Self-control was assessed with the Brief Self-Control Scale (Tangney et al., 2004), consisting of 13 items that are answered on a scale from 1 (not at all) to 5 (very much). This scale was adapted from the Total Self-Control Scale, comprising of 36 items, and showed high (.92 and .93) correlations with this original scale. Cronbach's α for the Brief Self-Control Scale was .83–.85 in the scale development studies. Test–retest reliability is .87 (Tangney et al., 2004). A sample item is 'I am able to work effectively towards long-term goals'. A reverse coded sample item is 'I am lazy'. An individual self-control score is calculated by averaging all items after recoding. Cronbach's α in the current sample was .77, demonstrating adequate internal consistency.

Perceived control. Perceived control was assessed with the Sense of Mastery Scale (Pearlin & Schooler, 1978), consisting of seven items that were answered on a scale from 1 (do not agree at all) to 5 (fully agree) after recoding. Five of these items were phrased so that a higher score meant a lower sense of mastery (with factor loadings ranging from .56 to .76, Pearlin & Schooler, 1978), and two of these items were phrased so that a higher score indicated a higher sense of mastery (with factor loadings of $-.47$ for both items, Pearlin & Schooler, 1978). A reverse coded sample item is 'I have little control over the things that happen to me' (reverse coded). A non-reverse coded sample item is 'What happens to me in the future depends mostly on me'. Individual total scores for perceived control were calculated. Cronbach's α in the current sample was .83, demonstrating high internal consistency.

Analyses

Descriptives included information about response rate, male/female ratio, mean age, level of education and the number of participants from different types of neighbourhoods. Using one-way ANOVAs and chi-square tests, participants from the different types of neighbourhood were compared in terms of age, gender and education level. To double-check the categorisation of neighbourhoods, a chi-square test was conducted to test whether people in disadvantaged neighbourhoods had more trouble paying their bills than participants from non-disadvantaged neighbourhoods.

To test the hypothesised association between self-control and health outcomes, correlation analyses were conducted on the main control, health and lifestyle variables. To test the hypothesis on self-control, health outcome and lifestyle differences between different types of neighbourhoods, a set of one-way ANOVAs was conducted. Alpha was Bonferroni-corrected to adjust for multiple testing by dividing the alpha by the number of tests conducted.

In order to further test mediating associations between type of neighbourhood, self-control, perceived control and health outcomes and lifestyle variables, regression analyses were conducted. All regression analyses were done using the mediation model from Haye's (2012) PROCESS macro in SPSS, with 5000 bootstrapping samples, and 95% confidence intervals. The analyses are controlled for age, gender, education level and income. The mediation analyses on perceived control was also controlled for self-control, to test whether self-control would be of subordinate importance to perceived control in health differences between neighbourhoods.

Results

Participant characteristics

Responses were collected from 3758 participants (response rate 48%, 1689 male, 2069 female). Not all participants completed all parts of the survey. Missing data was not imputed. Mean age of the participants was 45.57 ($SD = 17.78$, range 19–96). 1747 participants completed a low level of education, and 1760 participants completed a high level of education. 1519 participants lived in disadvantaged neighbourhoods, and 2239 lived in non-disadvantaged neighbourhoods.

Participants from disadvantaged neighbourhoods were slightly older on average ($M = 47.46$, $SD = 19.13$) than participants from non-disadvantaged neighbourhoods ($M = 44.24$, $SD = 16.64$), $F(1, 3571) = 28.59$, $p < .001$. Gender was equally distributed over neighbourhoods, with 688 males and 831 females in disadvantaged neighbourhoods, and 1001 males and 1238 females in non-disadvantaged neighbourhoods, $\chi^2(1, N = 3758) = .13$, $p = .72$. Education level was skewed towards lower education in disadvantaged neighbourhoods (914 vs. 531), and in an opposite pattern skewed towards higher education in non-disadvantaged neighbourhoods (833 vs. 1229), $\chi^2(1, N = 3507) = 177.52$, $p < .001$. A greater proportion of people had trouble paying their bills in disadvantaged neighbourhoods (484/1455) than in non-disadvantaged neighbourhoods (502/2077), $\chi^2(1, N = 3532) = 35.17$, $p < .001$.

Correlations between variables

Correlations between key variables are presented in Table 1. Self-control positively correlated with self-reported general health, emotional wellbeing and perceived control. A higher level of self-control also correlated with a lower BMI, more days a week on which participants consumed cooked and raw vegetables, salads and fruit, fewer units of alcohol consumed per week, and fewer cigarettes smoked per day. These associations show that in general, self-control is related to a healthier lifestyle and more positive health outcomes.

Table 1. Correlations between key variables.

	SC (1)	Gen. health (2)	Well-being (3)	Perc. control (4)	BMI (5)	Cooked veg (6)	Raw veg (7)	Fruit (8)	Alcohol (9)	Cigarettes (10)
(1)		.15**	.26**	.30**	-.10**	.14**	.10**	.18**	-.19**	-.16**
(2)	.15**		.33**	.48**	-.30**	.10**	.05**	.05**	-.07**	-.32**
(3)	.26**	.33**		.50**	-.07**	.19**	.09**	.15**	-.05**	-.28**
(4)	.30**	.48**	.50**		-.16**	.15**	.08**	.07**	-.08**	-.29**
(5)	-.10**	-.30**	-.07**	-.16**		-.09**	.03	-.01	.05**	.23**
(6)	.14**	.10**	.19**	.15**	-.09**		.24**	.23**	-.07**	-.24**
(7)	.10**	.05**	.09**	.08**	.03	.24**		.20**	.004**	-.10**
(8)	.18**	.05**	.15**	.07**	-.01	.23**	.20**		-.15**	-.20**
(9)	-.19**	-.07**	-.05**	-.08**	.05**	-.07**	.004**	-.15**		.21**
(10)	-.16**	-.32**	-.28**	-.29**	.23**	-.24**	-.10**	-.20**	.21**	

Note. Variable names are abbreviated: SC = Self-control, Gen. health = General health, Perc. control = Perceived control, Cooked veg = Cooked vegetable intake, Raw veg = Raw vegetable and salad intake, Fruit = Fruit intake, Alcohol = Alcohol intake, Cigarettes = Cigarettes smoked.

Correlations with a double asterisk are significant at the $\alpha = .001$ level.

Table 2. Means, standards, *F* values, *df* and *p* values for differences between disadvantaged and non-disadvantaged neighbourhoods in health outcomes, lifestyle variables and control.

	Disadvantaged neighbourhood (<i>N</i> = 1519) <i>M</i> (<i>SD</i>)	Non-disadvantaged neighbourhood (<i>N</i> = 2239) <i>M</i> (<i>SD</i>)	<i>F</i> value	<i>Df</i>	<i>p</i> value
Self-reported general health	3.74 (.85)	3.99 (.75)	93.15	1, 3723	<.001**
Emotional wellbeing	3.58 (1.27)	3.77 (1.06)	25.72	1, 3542	<.001**
BMI	25.36 (4.83)	24.59 (4.04)	27.58	1, 3679	<.001**
Cooked vegetable intake	4.97 (1.72)	5.29 (1.58)	34.21	1, 3536	<.001**
Raw vegetable/salad intake	2.99 (2.03)	3.24 (2.04)	13.03	1, 3488	<.001**
Fruit intake	4.67 (2.31)	4.76 (2.12)	1.25	1, 3545	.26
Units alcohol /week	8.79 (10.89)	8.70 (8.99)	.06	1, 2807	.81
Cigarettes/day	12.11 (8.61)	10.29 (9.00)	8.11	1, 761	.005
Self-control	3.50 (.65)	3.52 (.63)	.81	1, 3446	.37
Perceived control	25.37 (5.44)	27.04 (5.01)	87.06	1, 3462	<.001**

Note. To correct for multiple comparisons, the Bonferroni method was applied. The resulting α was .005. *p* values with a double asterisk are significant at the $\alpha = .001$ level. *p* values with a single asterisk are significant at the $\alpha = .005$ level.

Main analyses

Means, standard deviations, and statistics of the one-way ANOVAs conducted to test neighbourhood associations with outcome variables are presented in Table 2. Self-reported general health and emotional wellbeing were significantly lower in disadvantaged neighbourhoods compared to non-disadvantaged neighbourhoods. BMI was significantly higher in disadvantaged compared to non-disadvantaged neighbourhoods. Participants in disadvantaged neighbourhoods ate cooked vegetables and raw vegetables/salad fewer days per week than participants in non-disadvantaged neighbourhoods. There were no significant differences between disadvantaged and non-disadvantaged neighbourhoods with regards to the number of days per week participants consumed fruit, the number of cigarettes smoked per day, or in the number of alcohol units that were consumed per week. summarising, this pattern of results indicates that health and wellbeing are impaired in disadvantaged neighbourhoods.

Perceived control was higher in non-disadvantaged compared to disadvantaged neighbourhoods, but interestingly, level of self-control did not differ between participants in disadvantaged and non-disadvantaged neighbourhoods. This suggests that the differences between the two types of neighbourhoods are unlikely to be caused by differences in self-control ability. To further test this, regression analyses were conducted to investigate whether the association between neighbourhood type and health outcomes and lifestyle variables was mediated by self-control level. Table 3 shows indirect effect estimates and 95% confidence levels for the effect of type of neighbourhood on the outcome measures, as mediated by self-control. The analyses are controlled for age, gender, education level, and income.

The analyses demonstrated no significant mediation through self-control. To test whether perceived control may in fact be more important, another set of mediation analyses was conducted, with type of neighbourhood as the independent variable, perceived control as a mediator, and health outcomes and lifestyle variables as dependent variables. Self-control, gender, age, education level and income were controlled for. Indirect effect estimates and confidence intervals are displayed in Table 3.

Table 3. Indirect (mediation) effects between type of neighbourhood, health outcomes and lifestyle variables, and self-control and perceived control respectively, including 95% confidence intervals.

Dependent variable	Self-control			Perceived control		
	Indirect effect	LLCI	ULCI	Indirect effect	LLCI	ULCI
Self-reported health	-.00	-.01	.01	.04*	.03	.06
Emotional wellbeing	.00	-.02	.02	.09*	.06	.12
Cooked vegetable intake	.00	-.01	.01	.03*	.01	.04
Raw vegetable/salad intake	-.00	-.01	.01	.02*	.01	.04
Fruit intake	.00	-.02	.02	.01	-.003	.03
Units of alcohol/week	-.00	-.15	.13	-.01	-.05	.08
Cigarettes/day	-.02	-.03	.02	-.20*	-.49	-.04
BMI	.00	-.03	.04	.02	-.01	.05

Note. Indirect effect estimates with an asterisk indicate significant mediational pathways.

Perceived control significantly mediated the association between neighbourhood and self-reported general health. Participants from a disadvantaged neighbourhood reported less perceived control, and this was associated with a lower level of self-reported general health. Similar mediations by perceived control were found for emotional wellbeing, days per week on which cooked vegetables were consumed, and the number of cigarettes smoked per day. The lower intake in raw vegetables and salad and fruit, the more units of alcohol consumed, and higher BMI in disadvantaged neighbourhoods could not be mediated by differences in perceived control. In general, these mediation patterns suggest that perceived control may partially explain the differences in health outcomes and lifestyle that exist between disadvantaged and non-disadvantaged neighbourhoods.

Discussion

Findings confirmed the hypothesis that people from disadvantaged neighbourhoods generally report poorer health outcomes and a less healthy lifestyle than people from non-disadvantaged neighbourhoods. These general results are in line with previous research highlighting that health and wellbeing are lower in disadvantaged neighbourhoods (Duncan & Kawachi, 2018; Kirby & Kaneda, 2005; Robert Wood Johnson Foundation, 2008; Sampson et al., 2002; Pickett & Pearl, 2001; Robert, 1999; Roubinov, Hagan, Boyce, Adler, & Bush, 2018; Sheets et al., 2017; Taylor et al., 1997; Yen & Syme, 1999; Winkleby et al., 2006).

In line with our other hypothesis, higher self-control was related to better self-reported general health, higher emotional wellbeing, and higher vegetable, salad, and fruit intake, a lower consumption of alcohol and cigarettes, and a lower BMI. Interestingly however, self-control level did *not* differ between people from disadvantaged and non-disadvantaged neighbourhoods. Therefore, the association between type of neighbourhood and health outcomes was not related to differences in self-control between those neighbourhoods. Findings furthermore demonstrated that participants in disadvantaged neighbourhoods experienced less perceived control over their environment than participants in non-disadvantaged neighbourhoods. Interestingly, this lowered perceived control mediated the association between neighbourhood and health outcomes as well as a number of lifestyle variables, above and beyond self-control level. This implies that, as hypothesised, health differences

between neighbourhoods may be due to differences in perceived control over the environment, rather than to differences in self-control.

The presented findings suggest that under suboptimal circumstances (i.e., in a disadvantaged neighbourhood), it is not so much (lack of) control over the self but rather (lack of) perceived control over one's environment that is associated with lower quality health outcomes and lifestyle. Interestingly, the disadvantaged context does not seem to be related to individuals' capacity to control their own impulses. These findings need to be taken into account when urging for health promotion interventions in these neighbourhoods (e.g., Diez-Roux, 2001; Hood, 2005; Oakes & Rossi, 2003; Robert Wood Johnson Foundation, 2008), and may serve as input when considering which approach or angle to take when tackling these issues.

Strengths and limitations

The current study adds to the existing body of knowledge on individual and environmental factors in health and wellbeing. As self-control is essential in many life outcomes (De Ridder et al., 2012; Moffitt et al., 2011; Tangney et al., 2004), studying its natural occurrence is imperative. A first strength of this study is therefore that self-control, along with its association with environmental and health factors, was explored in a large community sample rather than in a smaller laboratory setting. A second strength of this study is the inclusion of perceived control: although perceived control, or sense of mastery, is seen as a significant factor for coping with life's stressors (Pearlin & Schooler, 1978; Robert, 1999), field studies demonstrating this significance (Bosma et al., 1999; Bailis et al., 2001) are still scarce. Of course, field studies such as the current study also carry limitations: Due to the cross-sectional nature of the study, causality cannot be established with certainty. It must therefore be emphasised that all reported associations are correlational in nature. This also means that effects in the opposite direction (e.g., health impacting economic status, Smith, 1999) cannot be ruled out on the basis of this study. Furthermore, it must be noted that the reported effects are small. Although still meaningful, the large sample size and relatively small differences do call for caution when interpreting the results.

Implications and concluding remarks

Findings from the current study hold implications for the field of health promotion in general, and for public health policy and intervention development in particular. As demonstrated, only targeting individuals' self-control levels may not lead to the desired health effects in disadvantaged neighbourhoods. In fact, specifically in deprived areas where the environment is suboptimal, perceived control is a factor that should not be neglected when developing and implementing health interventions. One could consider targeting participants' perceived control, for example by developing coping skills training programs dedicated to the stressors and obstacles that people need to deal with living in a disadvantaged neighbourhood (McMillan et al., 2006; Taylor & Stanton, 2007). However, it must be taken into account that the indirect effects in the current study are small, which suggests that perceived control is one of

many factors playing a role in the association between type of neighbourhood and health outcomes.

Interventions that focus on intra-individual variables like self-control are however not obsolete. This study demonstrated that differences in self-control do relate to differences in health outcomes and lifestyle. Thus, increasing people's self-control or self-regulation in general is still a fruitful undertaking that can potentially lead to promotion of health and prevention of illness. However, the assumption that people in disadvantaged neighbourhoods have their lack of self-control to blame for their poorer health status is not supported by this research. In disadvantaged neighbourhoods, more obstacles need to be overcome for one to make healthy choices, requiring more self-control, whereas in non-disadvantaged neighbourhoods, one's physical and/or social environment may be much more supportive of these healthy choices.

This study demonstrates the importance of considering a range of factors when thinking about health and wellbeing, including those at an individual level, like perceived control and self-control, as well as on an environmental level, including the neighbourhood people live in. Results from this study revealed that one's perceived control over the environment is more important than self-control when explaining health effects of the type of neighbourhood people live in.

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