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How does cultural capital keep you thin? Exploring unique aspects of cultural class that link social advantage to lower body mass index

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Abstract A widely used indicator for cultural class is strongly related to a lower body mass index (BMI): cultural capital measured as ‘highbrow’ taste. This study’s objective was to theorise and measure aspects of cultural class that are more plausibly linked to low BMI, and subsequently explore their relevance. Building on Bourdieusian theory we derive four of those aspects: ‘refinement’ (valuing form and appearance over function and substance), ‘asceticism’ (self-imposed constraints), ‘diversity’ (appreciation of variety in and of itself) and ‘reflexivity’ (reflexive deliberation and internal dialogue). Using standardised interviews with 597 participants in the Dutch GLOBE study in 2016, we subsequently demonstrate: (i) newly developed survey items can reliably measure four aspects of cultural class: ‘asceticism’, ‘general refinement’, ‘food refinement’ and ‘reflexivity’ (Cronbach’s alphas between 0.67–0.77); (ii) embodied/objectified cultural capital (i.e. ‘highbrow’ taste) was positively associated with general refinement, food refinement and reflexivity, whereas institutionalised cultural capital (i.e. education) was positively associated with asceticism and reflexivity; (iii) asceticism, general refinement, reflexivity, but not food refinement, were associated with a lower BMI; (iv) asceticism, general refinement and reflexivity together accounted for 52% of the association between embodied/objectified cultural capital and BMI, and 38% of the association between institutionalised cultural capital and BMI.

Keywords: cultural capital, cultural class, body mass index, health inequalities, Bourdieu

Introduction

The ongoing surge in obesity and overweight rates across the globe is a major threat to population health (G.B.D. Obesity Collaborators 2017). Changes in the food environment and food system have been integral to the widespread obesity epidemic, due to increasing availability,

accessibility, affordability and visibility of unhealthy food products (Swinburn *et al.* 2011). These ‘obesogenic environments’ severely limit the capacity for effective body weight control (Swinburn *et al.* 1999). To better understand the unequal distribution of overweight and obesity, it is important to study why some are less vulnerable to the obesogenic environment than others (Bissell *et al.* 2016).

Socioeconomic status (SES) is among the strongest predictors of body weight, with strong inverse associations between indicators of SES and body mass index (BMI) found in numerous high income countries (Hoffmann *et al.* 2017). Recently, studies have started to investigate the importance of cultural capital for socioeconomic inequalities in BMI (Christensen and Carpiano 2014, De Clercq *et al.* 2017, Fismen *et al.* 2012, Kamphuis *et al.* 2018, Oude Groeniger *et al.* 2019, Oude Groeniger *et al.* 2017, Pampel 2012), because of the well-established relationship between socioeconomic position and cultural capital (Ridgeway 2014, van der Waal and de Koster 2015), and the hypothesised importance of cultural capital for maintaining a lower BMI (Abel 2008, Williams 1995). Cultural capital refers to tastes and dispositions instilled in privileged positions (Savage *et al.* 2015) and is defined as ‘*high status cultural signals (attitudes, preferences, formal knowledge, behaviors, goods and credentials) used for social and cultural exclusion*’ (Lamont and Lareau 1988: 156). Studying the importance of cultural capital for understanding socioeconomic inequalities in BMI resonates with ‘cultural class analysis’ ‘*which seek[s] to make cultural issues central to the analysis of class*’ (Savage *et al.* 2015: 1013), as ‘*there are mechanisms of accumulation other than those arising from the labour market alone*’ (Savage *et al.* 2015: 1017). Contemporary health inequalities research also acknowledges that cultural capital may ultimately exert a significant impact on BMI over and above the impact of the economic privilege that instilled cultural capital in the first place (Abel 2008).

Tellingly in this respect, is that Pampel (2012) showed that sedentary leisure-time activities indicating ample cultural capital (e.g. reading) were associated with a lower BMI, while sedentary leisure-time activities indicating limited cultural capital (e.g. watching television) were linked to a higher BMI – independent from various standard SES indicators such as income. This implies that ‘*[t]he activities are spuriously yet still meaningfully associated with body weight through a possible common cause – cultural tastes that in part distinguish SES-related group membership*’ (Pampel 2012: 407). In other words, Pampel demonstrated that cultural capital acquired in privileged conditions is a key aspect of social advantage relevant for keeping lower BMI in obesogenic conditions, over and above the economic aspects of SES.

Inspired by findings that show a substantial empirical relationship between conventional measures of embodied cultural capital and BMI (i.e. ‘highbrow’ preferences, such as cultural participation and reading of books) (Christensen and Carpiano 2014, Pampel 2012), this study’s objective was to theorise, measure, and subsequently explore the relevance of cultural aspects of social advantage that can be more plausibly linked to a lower BMI. Informed by a large body of (neo-)Bourdieuian literature around the notion of cultural capital, we retrieved four dispositions instilled in privileged conditions that can be theoretically plausibly linked to a lower BMI: ‘refinement’, ‘asceticism’, ‘diversity’ and ‘reflexivity’. Below, we describe how these dispositions reflect contemporary high cultural capital, and theorise how they relate to a lower BMI. We hypothesise that these dispositions relate to a lower BMI across the entire BMI distribution, rather than e.g. only lowering the probability of being obese, and structure our theoretical framework and empirical analysis accordingly. Although health risks manifest at both higher (i.e. BMI >25) and lower levels of BMI (i.e. BMI <20), the burden of disease associated with the former is much higher in contemporary Western societies (Global B.M.I. Mortality Collaboration 2016). Hence, demonstrating the importance of cultural aspects of

social advantage for maintaining a lower BMI may have important implications for understanding health in contemporary obesogenic environments.

Cultural aspects of social advantage relevant for BMI

Refinement

According to Bourdieu (1984), higher status groups are less constrained by economic necessities and practical urgencies, and consequently able to acquire a disposition towards refinement: a disposition that values form and appearance over function and substance. It allows for distinction from and exclusion of lower status groups (Blasius and Friedrichs 2008, Bourdieu 1984, Williams 1995), as their underprivileged conditions force working-class families to adopt a '*taste of necessity*' (p. 175), that is, '*a taste for "what is available to them"*' (Williams 1995: 590; see also Blasius and Friedrichs 2008: 27). In relationship to body weight, refinement may contribute to socioeconomic differences in BMI via food consumption and body image. This was already claimed by Bourdieu: the lower strata prefer readily available heavy, fatty and strong foods (prioritising the nourishing substance of food, which sustains and strengthens the body), whereas the upper strata give priority to form, and prefer light, refined and delicate foods (distinguishing themselves by the '*antithesis between quantity and quality, belly and palate, matter and manners, substance and form*'. 1984: 177). Consequently, for high cultural capital milieus, thinness becomes a marker of distinction and an objective to cultivate in itself. In addition, a disposition towards refinement may include a preference for acquired tastes (e.g. sour and bitter are preferred over sweet), which could translate into a consumption pattern that is healthier than a consumption pattern that consists of more energy-dense foods.

Asceticism

Asceticism is '*the practice of self-discipline, self-denial, or self-restraint in order to achieve a certain goal*' (Adair-Toteff 2015: 60). In other words, asceticism is characterised by self-imposed constraints and restrictions, and incites satisfaction from effort itself and deferred gratification. According to Bourdieu, high cultural capital milieus developed a sense of '*aristocratic asceticism*' oriented toward the most austere leisure activities (Bourdieu 1984), in opposition to the '*hedonistic taste for luxury, ornament, and ostentation*' (Swartz 2002) of high economic capital groups. As such, the disposition asceticism reflects the need for distinction within the higher socioeconomic segment on the one hand, while on the other hand the absence of the wear and tear of daily working-class life enables its cultivation. Asceticism may contribute to a lower BMI due to a preference for moderate food consumption and a controlled diet, which in contemporary societies likely results in a penchant for healthy, natural food products. In addition, asceticism may also be directly related to a lower body weight due to a tendency to cultivate the body with an '*ethic of sobriety for the sake of slinness*' (Bourdieu 1984: 179).

Diversity

Diversity refers to a preference for variety in and of itself. Whereas Bourdieu emphasised the higher strata's appreciation of 'highbrow' culture, more recently '*cultural omnivorousness*' (Peterson and Kern 1996, Warde *et al.* 1999) and '*cosmopolitanism*' (Prieur and Savage 2013) are identified as crucial cultural capital indicators. For example, Warde *et al.* (1999) suggest that cultural omnivorousness – a preference for a wide variety of cultural activities – is increasingly '*valued in its own right, as an end rather than a means*' and is '*equated with cultural sophistication*' (p. 120). Furthermore, Prieur and Savage (2013) suggest that

'*cosmopolitan attitudes and preferences*' are especially cultivated in institutions of higher education (van der Waal and de Koster 2015). Consequently, the lower strata are largely excluded from developing openness to foreign others and cultures. A more general disposition for diversity (although perhaps also inspiring appreciation of a variety of body types) may be related to the pursuit of variety in food consumption (e.g. novel and exotic foods) and a preference for '*ethnic*' cuisine (Beagan *et al.* 2015). This would be related to a lower BMI if such diets resulted in a lower caloric intake than in case of traditional (here: native Dutch) diets.

Reflexivity

Reflexivity, as used here, refers to the extent to which someone engages in deliberation and an internal dialogue about their actions, circumstances and experiences. Evidently, reflexivity largely results from prolonged socialisation in institutions of higher education. Additionally, the higher strata seem to be increasingly motivated by the reflexive acquisition of knowledge and information as a marker of distinction, and continuously reflect upon their actions and choices. Currid-Halkett (2017) calls this the '*aspirational class*', a new socially advantaged elite striving '*to make informed decisions around what to eat, how to treat the environment, and how to be better parents, more productive workers, and more informed consumers*' (p. 11). This resonates with Lareau's (2011) notion of '*concerted cultivation*': a childrearing practice that emphasises continuous improvement and development, enabled by favourable socioeconomic conditions. Reflexivity may contribute to a lower BMI due to an increasing awareness of and interest in health-specific knowledge that aids in abstaining from obesity-inducing behaviours (and taking up obesity-preventing ones). For example, reflexivity may emphasise the importance of physical activity, increase the attention paid to nutritional information and decrease unhealthy consumption. Moreover, the socially and environmentally conscious choices of the '*aspirational class*' often result in healthier consumption practices (e.g. organic, local). Reflexive childrearing practices (e.g. '*concerted cultivation*') may also cultivate healthy eating practices (in addition to cultivating a reflexive disposition in the child) by controlling and moulding children's tastes to prepare them for their future social positions (Backett-Milburn *et al.* 2010, Wills *et al.* 2011). Lastly, reflexivity may aid in maintaining a lower BMI by continuous self-monitoring of one's weight, body and health.

Approach

Our approach was twofold. First, we developed novel survey items to measure the dispositions derived theoretically. To the best of our knowledge, no existing questionnaires were available to measure these dispositions quantitatively. The questionnaire development is described in the Methods section. Second, we examined to what extent these dispositions account for the well-established relationship between traditional measures of high cultural capital and a lower BMI. The outcomes of these analyses are presented in the Results section.

Methods

Informed by a pilot study (described below), we selected survey items for the main data collection. Data were collected by means of standardised interviews, which took place at participants' homes early 2016. The interview study was part of the fifth wave of the longitudinal Dutch GLOBE study. GLOBE started in 1991, when a random sample of non-institutionalised persons (age 15–74) was recruited from 18 municipal population registers in the city of Eindhoven and surrounding villages in the South-east Netherlands (for detailed information see (van Lenthe *et al.* 2014). The fifth wave of the GLOBE study consisted of a postal survey in

fall 2014 and interviews early 2016. The postal survey was sent to those who had previously participated in the GLOBE study, and a new, additional subsample randomly drawn from Eindhoven's municipality register. A cross-sectional sample of respondents aged 25–75 living in Eindhoven was identified among all those who participated in the 2014 postal survey, and was representative of the source population ($N = 2812$). A subsample ($N = 1085$) (participants whose telephone number could be acquired from the national telephone register) was invited to participate in an additional face-to-face interview study. This produced a sample of 597 interview participants (response rate 55%). The use of personal data in the GLOBE interview study is in compliance with the Dutch Personal Data Protection Act and the Municipal Database Act, and has been registered with the Dutch Data Protection Authority.

Measures

BMI BMI was calculated from the participants' self-reported weight (kg) divided by the self-reported height squared (m^2).

Cultural capital Cultural capital was measured as two separate variables: (i) a combined measure of embodied and objectified cultural capital; and (ii) education (as a measure of institutionalised cultural capital). Embodied/objectified cultural capital was measured by 13 items that were standardised (z -scores) and combined into one continuous scale. Principal component analysis revealed that all items loaded on one underlying construct (Eigenvalue = 4.89), and reliability analysis revealed high reliability (Cronbach's alpha = 0.86). Based on a review of the most commonly used cultural capital measures (Kamphuis *et al.* 2015), the items included conventional measures of embodied (e.g. frequency of attending several cultural activities, reading books) and objectified cultural capital (e.g. the possession of books and art). Appendix S1 provides a detailed description of all items. The highest attained educational level was classified according to the International Standard Classification of Education (ISCED): (i) low (no education, primary education, secondary education, ISCED 0–2), (ii) middle (intermediate vocational education and higher secondary education, ISCED 3–4) and (iii) high (higher vocational education and university, ISCED 5–7).

Confounders The sociodemographic characteristics included were gender (male, female), age and self-identified ethnicity (Dutch, other). All regression analyses were also adjusted for household income. Data on monthly net household income (€0–1200, €1200–1800, €1800–2600, €2600–4000, >€4000) were derived from the 2014 survey.

Disposition survey items

Pilot survey Our pilot survey was fielded in January 2016 and included 45 items intended to measure the dispositions discussed above ($n = 343$; 14–77 years; 56.6% female). This survey was self-completed by university students ($n = 236$) and a non-random sample recruited through the social networks of the authors and a research assistant (47 offline and 60 online). Informed by factor and reliability analyses and comments on this pilot study, we removed 12 items that proved redundant or ambiguous.

Main survey The remaining 33 items were included in the GLOBE questionnaire (Appendix S2 provides details). All items were measured on a 7-point scale and recoded when necessary so that higher scores indicated high status cultural signals. The questionnaire consisted of statements with a single item rating scale ('to what extent do you agree with the following statement?') and 'forced choice' statements (opposing statements within each item, forcing the respondent to choose between alternatives) (Bartram 2007). The positioning of the

opposing statements was randomised to improve validity and reduce acquiescence bias (Bowling 2014).

We included seven items consisting of six opposing statements and one single statement to measure asceticism. For example, the opposing statements were: 'I think it is important to restrain myself' versus 'I enjoy letting go'; and 'It is important to always do what you enjoy' versus 'It is important to not surrender to your desires'. Item ASC7 was adapted from van Strien (2004).

We included 12 items to measure refinement, addressing both refinement in general and refinement related to food. Three items (FRF1, FRF2 and FRF3) were adapted from Willekens and Lievens (2015). An example of a general item is: 'Beautiful design is more important than practical use'. Refinement related to food was measured with items like: 'I am interested in the way food is prepared in other cultures' and 'I like to eat something bitter (such as chicory, Brussels sprouts, grapefruit)'.

We included three items consisting of opposing statements to measure diversity, for example: 'I like to experience new things' versus 'I like having fixed habits'; and I *do not* think it is important to have much variety in my life' versus 'I think it is important to have much variety in my life'.

We included ten items consisting of opposing statements to measure reflexivity. For example: 'I do not reflect long on new ideas or events' versus 'I often carefully consider new ideas and events'; and 'I take life as it comes' versus 'I frequently consider how I can best organize my life'.

Analytic strategy First, confirmatory factor analyses were performed using structural equation models (SEM; method: Maximum Likelihood) to investigate how many latent factors could be derived (based on model fit scores). Second, we examined whether it was necessary to remove items. This was done if: (i) they did not have a significant factor loading; or (ii) modification indices indicated that an item loaded on multiple factors (that is, allowing for an additional factor loading led to a better model fit). Third, reliability analyses were performed to examine whether reliable scales could be constructed using the items belonging to each latent factor (Cronbach alpha scores above 0.6 were considered to be sufficiently reliable).

Confirmatory factor analyses Appendix S2 shows the results of the confirmatory factor analyses. In step 1, all items were fitted in four series of models using SEM. Items were fitted as indicating: (i) one latent factor ('general high cultural capital dispositions'); (ii) four correlated latent factors representing the four dispositions that we distinguished theoretically (Asceticism, Overall Diversity, Overall Refinement and Reflexivity); (iii) five correlated latent factors, allowing for a subdivision between General Refinement and Food Refinement; (iv) six correlated latent factors, allowing for an additional subdivision between Food Refinement and Non-Sweet Taste. Various fit indices (root mean square error of approximation, *p*-close, comparative fit index, Akaike information criterion) showed that each more fine-grained model fitted the data better. Five items were subsequently removed: four were ambiguous and one was non-loading (listed in Appendix S2). Having removed these five items, the same series of models were fitted. Again, all fit indices showed that each more fine-grained model fitted the data better. Figure 1 provides a graphical depiction of the final model, including the factor loadings.

Reliability analyses Reliability analyses revealed that four of the six empirically distinguished dispositions could be measured by a reliable scale based on the items included in the study. Cronbach's alphas were: 0.67 for Asceticism (six items; ASC7 was removed to improve

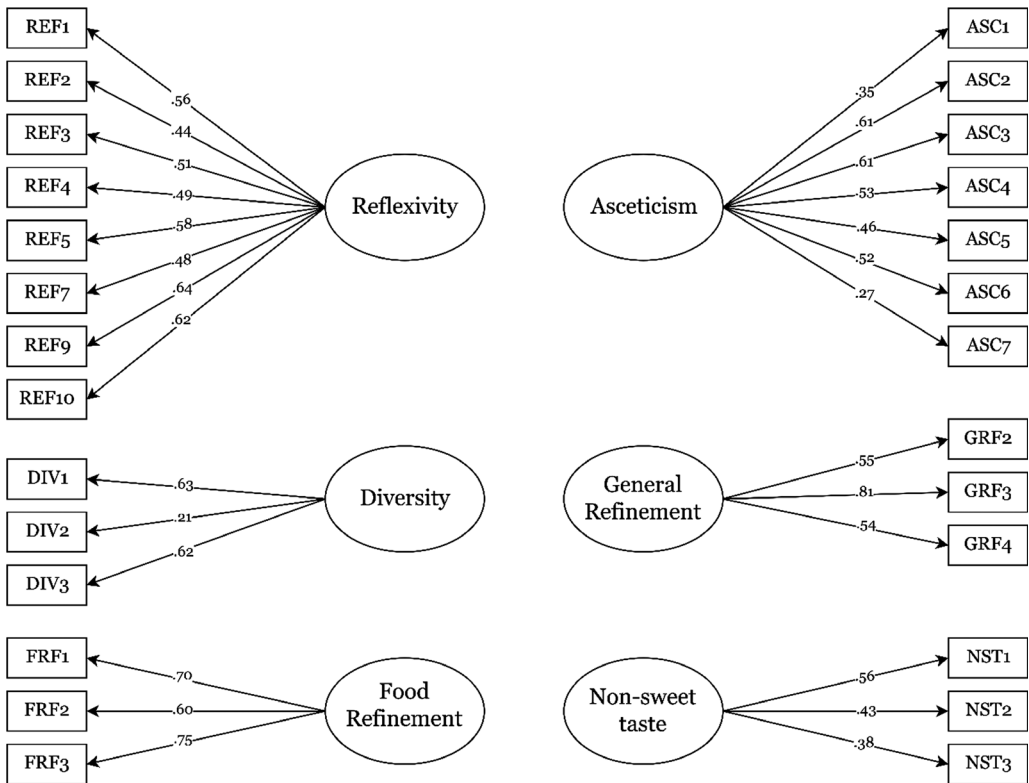


Figure 1 Graphical depiction of the final confirmatory factor analysis including factor loadings. Note: correlations between factors are not shown; see Appendix S3.

reliability); 0.67 for General Refinement (three items); 0.72 for Food Refinement (three items); and 0.77 for Reflexivity (eight items). Diversity and Non-Sweet Taste could not be measured reliably. One item intended to measure Diversity (DIV2) led to poor reliability, but after removing this item the two remaining ones still formed an insufficiently reliable scale (Spearman-Brown reliability = 0.56). The reliability of the three items for Non-sweet taste was also poor (Cronbach's alpha = 0.43). The four empirically distinct and reliable scales (Asceticism, General Refinement, Food Refinement and Reflexivity) are listed in Table 1 and were used in the main analysis.

Main analysis

The main analysis explored to what extent the dispositions accounted for the relationship between cultural capital and BMI. Almost all measures were without missing values (exceptions: BMI 2% missing; ethnicity 5% missing; and income 10% missing). Missing values were imputed by multiple imputation by chained equations ($M = 5$) using all listed measures and additional covariates from the interview study. Multiple imputation yields more valid results than complete case analysis when missing data depends on the values of other observables in the imputation set (Goldstein 2009). First, descriptive statistics for the study sample were calculated. Second, multivariable linear regression models were used to estimate the association between cultural capital and BMI. Third, multivariable linear regression models were used to estimate the association between cultural capital and the dispositions. Fourth, multivariable

Table 1 *Final survey items measuring four high cultural capital dispositions*

<i>Asceticism</i>	
To what extent you think a statement fits you?	
Response categories: [left side 3, 2, 1] [0 = neutral] [1, 2, 3 right side]	
I think it is important to restrain myself*	I enjoy letting go*
It is important to always do what you enjoy	It is important to not surrender to your desires
I try to have as much fun as possible	It's only when I have really earned it that I allow myself to have some fun
I believe it is better to postpone pleasure*	I prefer immediate pleasure over future pleasure*
You should do whatever you like	You should always act responsibly
I think it is important to just enjoy life	I think it is important to always live in accordance with health guidelines
<i>General refinement</i>	
To what extent do you agree with this statement?	
Response categories: [completely disagree 3, 2, 1] [0 = neutral] [1, 2, 3 completely agree]	
Things are more beautiful if they contain many subtle details	
I am interested in elegant and stylish products	
Beautiful design is more important than practical use	
<i>Food refinement</i>	
To what extent do you agree with this statement?	
Response categories: [completely disagree 3, 2, 1] [0 = neutral] [1, 2, 3 completely agree]	
I like trying out new recipes and flavours	
Going out to dinner is especially nice when I get to discover new dishes	
I am interested in the way food is prepared in other cultures	
<i>Reflexivity</i>	
To what extent you think a statement fits you?	
Response categories: [left side 3, 2, 1] [0 = neutral] [1, 2, 3 right side]	
I do not reflect long on new ideas or events	I often carefully consider new ideas and events
I often think about the way I organise my life*	I never think about the way I organise my life*
I do not reflect long on the things that I see or hear around me	I often contemplate the things that I see or hear around me
Before I make a decision, I consider and weigh all the options*	I prefer making decisions spontaneously*
It is important to understand why you do or don't do something*	You should just do things*
I just do things and see what happens	Before I do something, I think about what's the best way I can do it
I take life as it comes	I frequently consider how I can best organise my life
I often think about the reasons why I do or don't do certain things*	I try not to dwell on why I do or don't do certain things*

*Reverse coded.

linear regression models were used to estimate the association between the dispositions and BMI, while adjusting for cultural capital. Fifth, in order to explore to what extent the dispositions could account for the association between cultural capital and BMI, we estimated indirect effects of cultural capital on BMI via the dispositions. To do so we used the 'difference method' (Baron and Kenny 1986) which subtracts the estimated association between cultural capital and BMI without adjusting for the disposition(s) from the estimated association between cultural capital and BMI with adjustment for the disposition(s). This method is equivalent to the product method in the case of linear regression, but both methods are only valid if no interaction effect between predictor and mediator on the outcome is present (Valeri and Vanderweele 2013). Interaction terms were therefore added to the models to verify this assumption (no interaction effects were observed). Sixth, interaction effects between gender/age/income and the dispositions were added to the final model to examine whether the effects of the dispositions on BMI depended on gender/age/income (no interaction effects were observed). Seventh, indirect effects were bootstrapped (500 replications) to obtain 95% bias-corrected confidence intervals (Mackinnon *et al.* 2004). A 'percentage attenuated' was calculated by dividing the indirect effects with the total effects. The analyses were conducted using Stata version 13 (StataCorp, College Station, TX).

Results

Participants' age ranged between 26 and 77, with a mean of 61. The majority of the sample self-identified as Dutch (93%). Almost half of the participants were high educated, 24% low educated and 26% middle educated. BMI ranged between 16 and 51, with a mean of 26. Two percent of participants were underweight (BMI: <20), 44% overweight (BMI: 25–29.9) and 15% obese (BMI: 30≤). Scores on the four disposition scales ranged between 1 and 7, with mean levels between 3.48 (asceticism) and 4.77 (reflexivity), and standard deviations between 0.95 (asceticism) and 1.31 (food refinement). Appendix S4 provides descriptive statistics.

Embodied/objectified cultural capital and education (i.e. institutional cultural capital) were both associated with BMI (Table 2). Education was inversely associated with BMI ($b = -0.77$, 95% CI: $-1.76, 0.22$ for middle educated and $b = -1.48$, 95% CI: $-2.46, -0.51$ for high educated), which decreased by about one third after adjustment for embodied/objectified cultural capital. Higher embodied/objectified cultural capital was also associated with a lower BMI ($b = -0.82$, 95% CI: $-1.49, -0.15$).

High educated participants had higher levels of asceticism ($b = 0.26$, 95% CI: $0.05, 0.47$) compared to low educated participants, while both the high ($b = 0.78$, 95% CI: $0.54, 1.01$) and middle educated participants ($b = 0.42$, 95% CI: $0.18, 0.67$) had higher levels of reflexivity compared to the low educated participants (Table 3). Higher embodied/objectified cultural capital was associated with higher general refinement ($b = 0.47$, 95% CI: $0.28, 0.66$), higher food refinement ($b = 0.44$, 95% CI: $0.24, 0.65$) and higher reflexivity ($b = 0.51$, 95% CI: $0.35, 0.68$). The association between education and reflexivity was attenuated by almost half after adjustment for embodied/objectified cultural capital (Table 3).

Higher levels of asceticism ($b = -0.56$, 95% CI: $-0.93, -0.20$), general refinement ($b = -0.40$, 95% CI: $-0.69, -0.11$) and reflexivity ($b = -0.61$, 95% CI: $-0.94, -0.27$) were associated with a lower BMI, adjusting for education, embodied/objectified cultural capital and confounders (Table 4). Food refinement was not associated with a lower BMI ($b = 0.04$, 95% CI: $-0.23, 0.32$). These associations were also observed when the four dispositions were included in the same model ('Full model'; Table 4).

Table 2 *Linear regression models regressing body mass index on education (institutionalised cultural capital) and (embodied/objectified) cultural capital, adjusted for gender, age, ethnicity and income*

	Coef.	95% CI		p-value	Coef.	95% CI		p-value
Low educated	0				0			
Middle educated	-0.77	-1.76	0.22	0.127	-0.49	-1.50	0.52	0.338
High educated	-1.48	-2.46	-0.51	0.003	-0.94	-2.00	0.12	0.082
Cultural capital					-0.82	-1.49	-0.15	0.017

Table 3 *Linear regression models regressing reflexivity, asceticism, general refinement and food refinement on (embodied/objectified) cultural capital and education, adjusted for gender, age, ethnicity and income*

	Coef.	95% CI		p-value	Coef.	95% CI		p-value
Asceticism								
Low educated	0				0			
Middle educated	-0.02	-0.23	0.20	0.888	-0.03	-0.25	0.20	0.806
High educated	0.26	0.05	0.47	0.017	0.24	0.00	0.47	0.050
Cultural capital					0.04	-0.11	0.19	0.633
General refinement								
Low educated	0				0			
Middle educated	-0.12	-0.40	0.16	0.410	-0.28	-0.56	0.00	0.053
High educated	0.16	-0.12	0.43	0.263	-0.16	-0.45	0.14	0.291
Cultural capital					0.47	0.28	0.66	<0.001
Food refinement								
Low educated	0				0			
Middle educated	-0.02	-0.32	0.27	0.870	-0.18	-0.48	0.13	0.255
High educated	-0.03	-0.32	0.27	0.857	-0.32	-0.64	-0.01	0.046
Cultural capital					0.44	0.24	0.65	<0.001
Reflexivity								
Low educated	0				0			
Middle educated	0.42	0.18	0.67	0.001	0.25	0.01	0.49	0.044
High educated	0.78	0.54	1.01	<0.001	0.43	0.18	0.69	0.001
Cultural capital					0.51	0.35	0.68	<0.001

Table 5 shows the indirect effects of education and embodied/objectified cultural capital on BMI via the dispositions. Asceticism accounted for 14% of the association between education and BMI after adjustment for embodied/objectified cultural capital (indirect effect = -0.13, 95% CI: -0.34, 0.00), and 10% without such an adjustment (indirect effect = -0.15, 95% CI: -0.34, -0.02). Asceticism did not account for the association between embodied/objectified cultural capital and BMI (indirect effect = -0.02, 95% CI: -0.11, 0.07). General refinement accounted for 23% of the association between embodied/objectified cultural capital and BMI, adjusted for education and confounders (indirect effect = -0.19, 95% CI: -0.40, -0.06), but did not account for the association between education and BMI. Reflexivity was the strongest explanatory variable in the relationship between education and BMI and between embodied/

Table 4 Linear regression models regressing body mass index on reflexivity, asceticism, general refinement and food refinement, adjusted for education, (embodied/objectified) cultural capital, gender, age, ethnicity and income

	Coef.	95% CI		p-value	Coef.	95% CI		p-value
Separate models								
Low educated	0				0			
Middle educated	-0.49	-1.50	0.52	0.338	-0.51	-1.51	0.49	0.319
High educated	-0.94	-2.00	0.12	0.082	-0.81	-1.86	0.25	0.134
Cultural capital	-0.82	-1.49	-0.15	0.017	-0.80	-1.46	-0.13	0.019
Asceticism					-0.56	-0.93	-0.20	0.002
Low educated	0				0			
Middle educated	-0.49	-1.50	0.52	0.338	-0.60	-1.61	0.41	0.240
High educated	-0.94	-2.00	0.12	0.082	-1.00	-2.06	0.05	0.063
Cultural capital	-0.82	-1.49	-0.15	0.017	-0.63	-1.31	0.05	0.070
General refinement					-0.40	-0.69	-0.11	0.008
Low educated	0				0			
Middle educated	-0.49	-1.50	0.52	0.338	-0.49	-1.50	0.53	0.346
High educated	-0.94	-2.00	0.12	0.082	-0.92	-1.99	0.14	0.088
Cultural capital	-0.82	-1.49	-0.15	0.017	-0.84	-1.52	-0.15	0.016
Food refinement					0.04	-0.23	0.32	0.754
Low educated	0				0			
Middle educated	-0.49	-1.50	0.52	0.338	-0.34	-1.35	0.66	0.504
High educated	-0.94	-2.00	0.12	0.082	-0.68	-1.73	0.38	0.209
Cultural capital	-0.82	-1.49	-0.15	0.017	-0.50	-1.19	0.18	0.148
Reflexivity					-0.61	-0.94	-0.27	<0.001
Full model								
Low educated	0				0			
Middle educated	-0.49	-1.50	0.52	0.338	-0.48	-1.48	0.53	0.353
High educated	-0.94	-2.00	0.12	0.082	-0.66	-1.72	0.39	0.216
Cultural capital	-0.82	-1.49	-0.15	0.017	-0.43	-1.12	0.27	0.231
Asceticism					-0.42	-0.79	-0.05	0.027
General refinement					-0.38	-0.67	-0.09	0.011
Food refinement					0.10	-0.17	0.37	0.469
Reflexivity					-0.47	-0.82	-0.12	0.008

objectified cultural capital and BMI. Reflexivity accounted for 38% of the association between embodied/objectified cultural capital and BMI (indirect effect = -0.31, 95% CI: -0.51, -0.13) and 28% (with adjustment for embodied/objectified cultural capital) to 35% (without adjustment for embodied/objectified cultural capital) of the association between education and BMI (respectively, indirect effect = -0.26, 95% CI: -0.53, -0.10 and indirect effect = -0.52, 95% CI: -0.88, -0.26). Asceticism, general refinement and reflexivity together accounted for 52% of the association between embodied/objectified cultural capital and BMI, and 26% (with adjustment for embodied/objectified cultural capital) to 38% (without adjustment for embodied/objectified cultural capital) of the association between education and BMI.

Table 5 Indirect effects of (embodied/objectified) cultural capital and education on body mass index, mediated by reflexivity, asceticism and general refinement¹

	Cultural capital ²			Education ^{3,4}			Education ^{3,5}		
	Coef.	95% CI ⁶	% attenuation	Coef.	95% CI ⁶	% attenuation	Coef.	95% CI ⁶	% attenuation
Separate models									
Asceticism	-0.02	-0.11 0.07	3%	-0.13	-0.34 0.00	14%	-0.15	-0.34 -0.02	10%
General refinement	-0.19	-0.40 -0.06	23%	0.06	-0.04 0.26	-	-0.07	-0.25 0.04	5%
Reflexivity	-0.31	-0.51 -0.13	38%	-0.26	-0.53 -0.10	28%	-0.52	-0.88 -0.26	35%
Full model									
Asceticism, general refinement and reflexivity	-0.43	-0.70 -0.20	52%	-0.24	-0.57 -0.02	26%	-0.57	-0.98 -0.29	38%

¹Adjusted for gender, age, ethnicity and income.

²Additionally adjusted for education.

³Indirect effects only calculated for high versus low educated.

⁴Additionally adjusted for (embodied/objectified) cultural capital.

⁵No adjustment for (embodied/objectified) cultural capital.

⁶95% bias-corrected confidence intervals.

Discussion

Previous studies have shown that indicators of embodied cultural capital ('highbrow' preferences, e.g. cultural participation, reading of books) are associated with a lower BMI, in addition to the economic aspects of SES. This suggests that cultural dispositions developed in favourable socioeconomic conditions help navigate obesogenic conditions, over and above those conditions that enabled their initial cultivation (Abel 2008). As such, the well-established inverse relationship between embodied cultural capital and BMI clearly indicates the relevance of cultural class analysis (Savage *et al.* 2015), as it reflects that cultural aspects of SES give lower SES groups additional disadvantages in contemporary societies (above other barriers to lower BMI, such as an inability to afford a healthy diet). Obviously, it is not reading in itself that keeps people thin. Instead, favourable socioeconomic conditions breed cultural dispositions that help navigating obesogenic environments, for which conventional cultural capital indicators merely serve as a proxy (Pampel 2012). That is why this study identified specific cultural dispositions that elucidate how high cultural capital is associated with a lower BMI, and explored their relevance. Our findings suggest that dispositions towards reflexivity, asceticism and refinement partially account for the substantial relationship between cultural capital and BMI reported in various studies.

Comparison with other studies

Christensen and Carpiano (2014) previously examined whether food-related dispositions ('healthy eating efficacy', 'health conscious eating' and 'interest in cooking') and exercise ('light exercise' and 'sports and strenuous exercise') accounted for the association between cultural capital and BMI among a cohort of Danish women. They found that exercising partly mediated the inverse relationship between cultural capital and BMI, while food-related dispositions did not. Other studies specifically examined the relationship between cultural capital and dietary patterns and sports participation, and observed – in line with Bourdieu's own findings – that high cultural capital is associated with: healthier food consumption (De Clercq *et al.* 2017, Fismen *et al.* 2012, Kamphuis *et al.* 2015, Kamphuis *et al.* 2018, Kraaykamp 2002, McLaren and Kuh 2004, Oude Groeniger *et al.* 2019, Oude Groeniger *et al.* 2017, Sato *et al.* 2016); a greater involvement in sport (Christensen and Carpiano 2014, Wilson 2002); and differential sports participation (Kraaykamp *et al.* 2013, Scheerder *et al.* 2002, Stempel 2005, Wilson 2002). Future research could further explore the role of reflexivity, asceticism and refinement for the outcomes in abovementioned studies, as well as in stratified patterns in other health-related outcomes, such as smoking, alcohol consumption and (effective) healthcare utilisation.

Interpretation of the findings

Reflexivity accounted for approximately one-third of the relationship between cultural capital and BMI. This suggests that those with higher levels of cultural capital are more prone to engage in deliberation and internal dialogue, which is likely stimulated by parents who often engage their children in discussion (cf. 'concerted cultivation', Lareau 2011) and the attention given to reflexive reasoning in higher education. To study the importance of socialisation and parental cultural capital more in-depth, we repeated the analyses using childhood cultural capital measures (Appendix S5). These results showed that reflexivity was also associated with parental cultural capital, which supports the notion that cultural capital partly underlies the reproduction of health inequalities (Abel 2008). Socialisation in high cultural capital environments seems to instil a disposition towards reflexivity, which is a valuable resource to maintain a lower body weight in contemporary environments that encourage unhealthy consumption

and sedentary lifestyles. However, our measure of reflexivity may also show some overlap with traits and risk factors from (social-)psychological research. For example, IQ (Yu *et al.* 2010), mastery, self-efficacy or locus of control (AbuSabha and Achterberg 1997) and conscientiousness (Jokela *et al.* 2013), have also been shown to be associated with SES and BMI, and are likely correlated with reflexivity. Future research could focus on dissecting the role of reflexivity vis-à-vis those traits and risk factors in socioeconomic inequalities in BMI and body weight control.

Asceticism modestly accounted for the relationship between education and BMI, but did not play a role in the link with embodied/objectified cultural capital. A disposition towards asceticism has previously been associated with a moral ascetic attitude in sports that requires effort and suffering (Overman 1997, Stempel 2005). Stempel (2005), for example, showed that higher educational groups more often engage in strenuous sports and suggested that they '*use participation in sports to draw boundaries by strenuously working on their bodies to produce disciplined, high performing and achieving selves*' (p. 428). We argued that dispositions towards asceticism would likely also result in more healthy food consumption and a tendency to cultivate thinness. Although the association between asceticism and BMI suggests that this may be true, asceticism did not appear to be relevant in the relationship between cultural capital and BMI. Furthermore, we found no clear association between asceticism and parental cultural capital (Appendix S5). Asceticism, similar to reflexivity, may also be correlated to predictors of BMI that are more established in health economics and psychology, such as time perspective/delay discounting (Adams and White 2009) and self-control (Beenackers *et al.* 2018). Disentangling their role in the SES-BMI relationship requires better harmonisation of risk factors across disciplines.

General refinement partly accounted for the relationship between embodied/objectified cultural capital and BMI, but it did not contribute to educational inequalities in relation to BMI. These results suggest that refinement is specifically related to 'highbrow' activities and possessions, which corresponds with our operationalisation of refinement as favouring form over function. This disposition easily translates into a preference for 'highbrow' culture, which does not have an immediate function except for fulfilling the acquired tastes of those socialised in sociocultural environments that share a similar appreciation for these forms of culture. Similar results were found for the relationship between parental embodied cultural capital and refinement (Appendix S5). However, whereas general refinement was associated with BMI, food refinement was not. This suggests that food refinement – as operationalised here – did not result in the consumption of fewer energy-dense foods.

Our findings suggest that reflexivity, asceticism and refinement are more prevalent among higher strata and increase the likelihood of a lower body weight. These dispositions are initially acquired in favourable socioeconomic conditions, and are used to symbolically exclude members of lower strata. While these dispositions may not be adopted for health-related reasons specifically, they may be increasingly relevant when it comes to resisting obesogenic environments effectively. Indeed, Bissell *et al.* (2016) have previously shown that effective resistance to the obesogenic environment depends on social class. However, contemporary societies still emphasise personal responsibility in maintaining a healthy body weight and favour interventions that rely on individual agency (e.g. relying on information and education) over structural interventions (e.g. lowering salt or sugar content), even though the latter are more effective and more equitable (Adams *et al.* 2016, Backholer *et al.* 2014). This precedence disproportionately affects members of the lower strata, who grew up in conditions that hamper the cultivation of cultural dispositions that enable to successfully navigate obesogenic environments.

Limitations

This study offers a novel approach to the study of class-based inequalities in BMI by identifying relevant cultural class dispositions, and exploring their relevance for the well-established inverse association between cultural capital and BMI. However, some limitations need to be considered. First, the decisions we made while developing novel survey items to measure the hypothesised dispositions may have impacted the results. For example, to avoid overestimating the association between the dispositions and BMI, we have purposely included questions that do not directly address dispositions towards food, physical activity or body weight/type. Similarly, we refrained from asking questions that directly relate to SES (e.g. we did not measure reflexivity with items on time spent reflecting on budgets or bill paying priorities), because it would likely induce a spurious relation between SES and the dispositions. We believe that using general questions to measure the dispositions allowed us to more validly scrutinise our hypotheses, which is supported by the fact that our confirmatory factor analyses showed that food refinement and general refinement were separate latent factors (where questions related to eating behaviours loaded on the former and more general questions loaded on the latter). However, to the extent that the questions we included resonate more strongly with the type of reflexivity/asceticism/refinement found among higher status groups (while disregarding types more prevalent among lower status groups), we may have overestimated the importance of these cultural aspects of social advantage for maintaining a lower BMI. This study is a first attempt to devise survey items to measure these aspects of cultural class and to assess their relevance, and we welcome future studies to build upon and improve the items developed here. Second, the sample's representativeness is limited, since younger age groups, minority groups and lower educated groups were underrepresented. Although we assume that the cultural dispositions explored in this study contribute to inequalities in BMI across all adult age groups, our sample consisted of a relative older study population and caution should be taken when extrapolating the results to younger ones. However, the absence of interaction effects between the dispositions and age on BMI supports our assumption that these dispositions are relevant for all ages. Still, selection bias may be present in this study and future research is warranted to examine whether the results are generalisable to different populations and contexts. Third, participation in our study may have been dependent on the studied dispositions. For example, reflexivity is likely associated with willingness to participate in an interview study. The current sample may therefore have a relatively high mean level of reflexivity, which may have affected the results. However, to the extent that it has done so, this has most likely led to an underestimation of the observed correlations. Fourth, because The Netherlands has a relatively generous welfare and social security system, cultural aspects of SES may be more important for BMI in The Netherlands than in countries with higher income inequalities. A greater relevance of economic than cultural aspects of SES may be especially pronounced in countries such as the United States, which suffer from much greater geographic inequalities in health strengthened by the presence of 'food deserts' where healthy foods are sometimes completely absent (Dwyer-Lindgren *et al.* 2016, Walker *et al.* 2010). To what extent our results are generalisable to these contexts remains to be explored. Fifth, the cross-sectional and observational nature of the data prohibits causality claims. Sixth, the use of self-reported data may suffer from measurement errors, although Nyholm *et al.* (2007) have shown that self-reported BMI measures tend to underestimate actual BMI levels, especially among lower socioeconomic groups. It is therefore more likely that this has resulted in an under- rather than an overestimation of effect sizes. Seventh, although results from confirmatory factor analyses confirmed that six empirically distinct latent factors could be derived from the questionnaire, there were no objective or otherwise existing measures of the proposed dispositions to test the construct validity of our newly developed scales. Although most measures were correlated with each

other and with indicators of cultural capital, additional validation would be valuable. Furthermore, while we were able to distinguish six constructs empirically, only four could be measured with reliable scales. The lack of reliable scales to measure a disposition toward diversity and non-sweet taste prohibits conclusions on the relationship between these dispositions and BMI.

Conclusions

In summary, the relevance of cultural aspects of class for the well-established link between SES and BMI, over and above the economic aspects that enabled their initial cultivation, is increasingly acknowledged. We explored, both theoretically and empirically, whether we could identify some of these aspects, and found that asceticism, reflexivity and a preference for refinement could partially account for that link. Our findings suggest that these dispositions aid members of the higher strata in maintaining a lower body weight in current obesogenic environments.

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Conflict of interest

The authors declare that they have no competing interests.

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Supporting information

Additional Supporting Information may be found in the online version of this article:

Appendix S1. Cultural capital measures included in the main analysis.

Appendix S2. Full list of survey items for measuring the dispositions.

Appendix S3. Correlations between the six constructs.

Appendix S4. Description of the study population.

Appendix S5. Parental cultural capital.

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