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Research report

When weight management lasts. Lower perceived rule complexity increases adherence☆

Jutta Mata [a,b,*], Peter M. Todd [a,c], Sonia Lippke [d]

[a] Center for Adaptive Behavior and Cognition, Max Planck Institute for Human Development, Lentzeallee 94, 14195 Berlin, Germany
[b] International Max Planck Research School "The Life Course: Evolutionary and Ontogenetic Dynamics (LIFE)", Berlin, Germany
[c] Cognitive Science Program, Indiana University, Bloomington, 1101 E. 10th Street, Bloomington, IN 47405, USA
[d] Department of Health Psychology, Freie Universität Berlin, Habelschwerdter Allee 45, 14195 Berlin, Germany

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ABSTRACT

Maintaining behavior change is one of the major challenges in weight management and long-term weight loss. We investigated the impact of the cognitive complexity of eating rules on adherence to weight management programs. We studied whether popular weight management programs can fail if participants find the rules too complicated from a cognitive perspective, meaning that individuals are not able to recall or process all required information for deciding what to eat. The impact on program adherence of participants' perceptions of eating rule complexity and other behavioral factors known to influence adherence (including previous weight management, self-efficacy, and planning) was assessed via a longitudinal online questionnaire given to 390 participants on two different popular weight management regimens. As we show, the regimens, Weight Watchers and a popular German recipe diet (Brigitte), strongly differ in objective rule complexity and thus their cognitive demands on the dieter. Perceived rule complexity was the strongest factor associated with increased risk of quitting the cognitively demanding weight management program (Weight Watchers); it was not related to adherence length for the low cognitive demand program (Brigitte). Higher self-efficacy generally helped in maintaining a program. The results emphasize the importance of considering rule complexity to promote long-term weight management.

Introduction

Across the Western world, people overeat and often choose unhealthy foods: almost one in three individuals in the U.S. is classified as obese (e.g., Baskin, Ard, Franklin, & Allison, 2005). In at least half of the European Union member states, prevalence levels of obesity in the population are higher than 20% (Fry & Finley, 2005). In Germany (where our study takes place), this rate is around 23% (Prugger & Keil, 2007).

Obesity is a major cause of morbidity and mortality (Allison, Fontaine, Manson, Stevens, & VanItallie, 1999), but still, numbers are rising (e.g., Ezatti, Martin, Skjold, Van der Hoorn, & Murray, 2006). Attempting to lose weight is a popular remedy; as many as 38% of women and 24% of men in the United States try to lose weight (e.g., Kruger, Galuska, Serdula, & Jones, 2004), with similar numbers in Great Britain (Wardle & Johnson, 2002) and Germany (Westenhoefer, 2001). Yet, few people successfully maintain weight loss over time (Jeffery et al., 2000), making it vital to understand how to extend adherence to weight loss and weight management programs.

Numerous studies have shown that adherence to changes in eating behavior is predicted by social-cognitive factors, such as self-efficacy, intention, and planning (e.g., Gollwitzer & Sheeran, 2006; Kremers, De Bruijn, Schaalma, & Brug, 2004; Luszczynska, Sobczyk, & Abraham, 2007; Schwarzer et al., 2007), and by previous behavior such as past diet attempts (Teixeira, Going, Sardinha, & Lohman, 2005). One aspect that has been little considered is the role of environment factors, both actual and perceived environment structure (e.g., Andajani-Sutjahjo, Ball, Warren, Inglis, & Crawford, 2004; Kurzenhäuser & Hertwig, 2008; Wansink, 2006) which food researchers have repeatedly shown to be significant in other contexts. For instance, Wansink (1996) showed that larger-sized packages of spaghetti or other foods lead people to serve themselves more (for an overview of environmental influences on food choice see Wansink, 2004).

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* Corresponding author at: Department of Psychology, Stanford University, Building 420 Jordan Hall, 450 Serra Mall, Stanford, CA 94035, USA.
E-mail addresses: jumata@stanford.edu (J. Mata), pmtodd@indiana.edu (P.M. Todd), s.lippke@fu-berlin.de (S. Lippke).

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Kurzenhäuser and Hertwig (2008) found that perceived environment structure influenced food choice, particularly those cues seen as most salient in the cafeteria environment they studied, including variety of foods offered and queue length to get different foods. Finally, coming closer to our focus in this paper, a community survey on barriers to weight maintenance found that 26% of young Australian women cited not having enough information about healthy nutrition as an important barrier, indicating problems with their information environment related to eating (Andajani-Sutjahjo et al., 2004).

Here we extend the exploration of environment structure influences on health behaviors to cognitive aspects of the environment, investigating how the perception of the cognitive complexity of rules to be followed affects health behavior change in a weight management context. In contrast to previous studies which emphasized the influences of either the objective or the subjective environment, here we attempt to compare both the actual environment structure and how it is perceived. The cognitive environment we study consists of the eating rules of weight management plans, which form a substantial part of the information that has to be processed to follow a weight management program.

People make decisions in many domains using simple rules (Gigerenzer, Todd, & the ABC Research Group, 1999; Kahneman, Slovic, & Tversky, 1982), including decisions about what to eat (Scheibehenne, Miesler, & Todd, 2007; Wansink, 2006). Scheibehenne and colleauges showed that a heuristic based on one decision cue predicted individual food choices as accurately as a more complex algorithm that took nine different decision-relevant factors into account. This suggests that human food choices might be based on very simple rules. Related results emerged from a recent "diet challenge" in which participants were encouraged to simplify their eating rules by making small environmental changes, including eating from smaller plates or not serving meals family style (Wansink, 2006; Wansink, Just, & Payne, 2009). In this case, a large proportion of participants who made simple changes to their environment lost more weight than a control group doing a face-to-face intervention with more complex behavior changes (Wansink, 2008). Inspired by these results and the assumption that it may be easier to adhere to simple rather than complex eating rules (e.g., Lally, Chipperfield, & Wardle, 2008), in this paper we ask whether the complexity of eating rules prescribed by weight management programs negatively affects adherence to those programs. We investigate cognitive complexity of two different popular weight management programs, both objectively and subjectively, and study its influence on how long individuals stay on a given program.[1]

The complexity of a task has been defined as the result of the "attentional, memory, reasoning, and other information processing demands imposed by the structure of the task" (Robinson, 2001, p. 29). Research on concept learning has demonstrated that more complex concepts are harder to learn (Feldman, 2003). Robinson further showed that an objectively more complex task was also rated as subjectively more complex by participants. Cognitive resource demands arising from following eating rules may be especially pressing for people trying to lose weight or facing diet restrictions, who have been found to perform worse on cognitive tasks than do non-dieters (Kemps, Tiggemann, & Grigg, 2008; Kemps, Tiggemann, & Marshall, 2005; Vreugdenburg, Bryan, & Kemps, 2003). According to some studies, trying to lose weight seems to selectively impair working memory, affecting performance on mental arithmetic (Vreugdenburg et al., 2003) and word length tasks (Shaw & Tiggemann, 2004). In turn, such mental arithmetic could be involved in keeping track of calories in weight management programs, while the ability to recall word lists after some delay could tap into the same memory processes that people on a weight management program have to use. Thus, trying to lose weight may deplete the very resources needed to follow complex eating rules—and may consequently make the rules seem more complicated.

Is a weight management program's cognitive complexity a significant predictor for the duration of adherence to the program, beyond motivational factors of behavior change? We hypothesize that if eating rules are perceived as too complicated from a cognitive point of view, people will be less likely to remember and process the information required by the rules, have more difficulty applying them, hence will be more likely to give up using them, and thus to abandon the subjectively-judged cognitively complex weight management program as a whole.

Methods

This hypothesis will be tested with two different approaches: first, an objective rule analysis based on the bestselling diet books for the two diets and second, a subjective longitudinal online study. We focused on two of Germany's most frequently used weight management programs, *Weight Watchers* and *Brigitte*. These two programs were chosen due to their high prevalence and differing cognitive requirements: *Weight Watchers* assigns point values to every food and instructs participants to eat only a certain number of points per day; points can be compensated for with physical activity or partly saved up to offset a special occasion. *Brigitte* is a recipe-based weight management program designed by one of Germany's most popular women's magazines of the same name, which provides recipes and shopping lists for every meal, thus requiring participants to simply follow the provided meal plans.

Rule analysis

The rule complexity of the Brigitte and Weight Watchers programs were evaluated via the corresponding bestselling books according to www.amazon.de (retrieved 22 June 2006; see Dost, 2004; Gerlach, Klosterfelde-Wentzel, & Khaschei, 2003). All rules from each book were individually assessed, counting how many values, amounts of food, or quantities of drinks (e.g., number of points, portions of fruit, or glasses of water) participants had to count and keep track of over the course of 1 day, representing arithmetic processing demands.

Online study

The online study took the form of an Internet questionnaire (programmed in HTML; data administration with the software *dynQuest*—Rademacher & Lippke, 2007) administered to each participant at three measurement points, each 4 weeks apart. After the third measurement point, or after stopping their weight management program, participants received individualized feedback on their Body Mass Index (BMI), planning and coping strategies, and nutrition knowledge.

In contrast to other weight management studies where all participants start a program at the same time and evaluations of adherence are done after 6 months or a year, our participants did not have a common starting point for their programs. Rather, we studied a time window of roughly 8 weeks within the course of

[1] This is different from what is assessed in other weight loss research studying low-complexity cognitive style in dieting, including aspects such as dichotomous thinking (Byrne, Cooper, & Fairburn, 2004). Cognitive complexity in our analysis does not mean, for example, whether participants classify foods strictly into "good" and "bad" categories. It rather refers to the perception of how difficult it is to remember or calculate information relevant to the weight management program, such as how many "points" a food has and keeping track of the number of points eaten over the day.

participants' individual weight management efforts. The advantage of this procedure is that we captured participants in the natural course of their weight management and thus were able to get a wider range of timing data for adhering to or quitting a program.

This method of studying participants in their natural weight management context (cf. Foster et al., 2003), rather than assigning them to a particular regimen, provides an especially strict test of our hypothesis, because if participants in our study self-selected their programs according to their cognitive abilities, this would reduce the effects of perceived rule complexity on adherence behavior, making the expected effect more difficult to observe.

We assessed the following measures in our study. If not mentioned otherwise, the measure values reported all refer to the first measurement point.

Perceived complexity. We measured four items assessing the participant's perceived complexity of (1) processing the information necessary to eat according to their weight management program, (2) deciding how much of a food one is allowed to consume, (3) knowing how to replace one food with another, and (4) keeping track of points or calories (e.g., "Referring to the Weight Watchers diet, how difficult do you find it to remember how many points you have consumed in the course of a day?"). Items were assessed on a 5-point scale from very easy to very difficult, with Cronbach's $\alpha = .80$. Participants only evaluated the complexity of the program they were currently following.

Weight management goals. Participants indicated how long they planned to stick to the rules of their current weight management program in number of days, weeks, months, years, "permanently," or "until I reach my goal weight."

Social-cognitive variables. Participants rated statements adapted from Schwarzer et al. (2007), on a 4-point scale, from strongly disagree to strongly agree, as follows: self-efficacy used three statements such as "I am sure that I can stick to my weight management program even if I need a long time to develop the necessary routines"; Cronbach's $\alpha = .63$. Intentions used three statements such as "I intend to eat in accordance with my weight management program's rules"; Cronbach's $\alpha = .74$. Planning used six statements such as "I have planned in detail the occasions during which I will stick to my weight management rules"; Cronbach's $\alpha = .74$.

Previous weight loss attempts. Participants stated how many times they had followed a weight management program before.

Demographics. Participants provided their age, sex, extent of school and professional education, height, and current weight.

Time on current weight management program. We obtained two different measures of time spent so far on the current weight management program at the third measurement point: we asked how long participants had been following their weight management program in total, and we added the time passed between first and third measurement to the length of time on the weight management program stated at the *first* measurement point. The measures did not differ ($t(133) = -1.14$, $p = .25$). For those who had stopped their weight management attempt during the course of our study, we used their estimate of how long they had been on the weight management program in total ("Approximately how long did you stick to your weight management regimen?"), with possible answer units in days, weeks, months, and years. Time on current weight management program is our main dependent variable because it is an alternative means of measuring weight loss success: higher attrition—equivalent to less time spent on a weight management program—goes along with lower weight loss (Teixeira et al., 2005).

Goal attainment. Only those participants who stopped their program during the study (reported at the second and third measurement point) were asked "Did you reach your desired weight?" (with five answer options ranging from "No, I have lost much less weight than I planned" to "I have lost much more weight than I planned") and "Did you stick to the weight management program for as long as you had planned?" (with analogous answers; adapted from Berry, Danish, Rinke, & Smiciklas-Wright, 1989).

Participants

Participants were recruited from 23 German-language Internet chat rooms dealing with weight management, a German Internet portal for psychological studies online, and via the websites of a

Table 1
Characteristics of participants.

	Brigitte	Weight Watchers	Difference: Brigitte – Weight Watchers
N (t1)	139	251	
N (t2)	105	199	
N (t3)	60	132	
Adherence total % (t1, t2 and t3)	80.0%	72.2%	$\chi(1) = 2.21$, $p = .16$
Attrition total % (t2 and t3)	45.3%	31.8%	$\chi(1) = 6.05$, $p = .02$
Weight at t1 (BMI); mean (*SD*)	27.9 (5.26)	29.0 (6.00)	$t(383) = -1.80$, $p = .07$
Weight loss (BMI; t3 − t1); mean (*SD*)	−0.82 (1.40)	−0.68 (1.25)	$t(170) = -0.65$, $p = .52$
Age; mean (*SD*)	39.2 (11.60)	33.7 (10.34)	$t(387) = 4.79$, $p < .001$
School education			
≤10-year school certificate	23.3%	31.6%	$\chi(1) = 2.72$, $p = .12$
13-year school certificate	73.7%	66.8%	
Professional education			
≤3-year vocational training	41.5%	49.2%	$\chi(2) = 17.03$, $p < .001$
University students	8.9%	20.8%	
Master's degree	44.4%	26.4%	
Profession at the time			
Employed	68.8%	61.4%	$\chi(2) = 3.09$, $p = .21$
In university or professional education	13.8%	17.5%	
Home (housewife, unemployed, retired)	14.5%	8.9%	
Weight management goals			
Time goal	35.1%	56.1%	$\chi(1) = 15.35$, $p < .001$
Weight goal	64.9%	43.9%	

Note. t1, t2, and t3 refer to the first, second, and third measurement point, respectively. Remaining percentages in rows that do not add up to 100% correspond to other categories not shown here because they represent a very small part of the sample.

large-circulation German women's magazine and a popular science magazine on psychology. Followers of Weight Watchers and Brigitte weight management regimens provided a sufficient number of participants ($N = 390$) to yield reliable results. Male participants (1.0% of the sample) and participants who reached their weight management goals (time or weight) during the study period (5.6%) were excluded because there were too few people in these categories for a separate reliable analysis. Furthermore, participants who reached their weight management goals and were thus considered successful (in contrast to those who stopped their diet without reaching their goal) were not the main focus of the study and so were also excluded.

Participants in this sample were slightly overweight and rather well-educated (Tables 1 and 2). The average attrition rate at 39.7% was lower than that of other Internet studies on health behavior (cf. 59% reported by Schwarzer et al., 2007). The 63 Brigitte (45.3%) and 80 Weight Watchers (31.8%) followers who did not respond at either the second or third measurement point (and so were dropped through attrition) did not differ from those that did respond in age, BMI, family status, education, time on weight management program, number of previous weight loss attempts, or social-cognitive factors.

The two groups, Brigitte and Weight Watchers, differ significantly in a few aspects (see Tables 1 and 2): Brigitte participants were on average older. This age difference is also reflected in the fact that Brigitte participants had a lower proportion of current university students and a higher proportion of university graduates than Weight Watchers. Brigitte participants were more likely to have a weight goal for their weight management program; Weight Watchers more often had a time goal. Women on Weight Watchers reported a higher number of previous diet attempts. Weight Watchers had a slightly higher self-efficacy but slightly less concrete planning than Brigitte participants.

Statistical analyses

Statistical analyses were performed using SPSS version 16.0. Differences in perceived complexity and adherence between different diet programs were calculated with Analyses of Variance. Our main statistical analyses were Cox hazard regression analyses. Cox regressions model the time that passes until a specified event occurs, such as quitting a weight management program, based on predictor variables. Here we report effects of predictors on dropout rate as odds ratios—the greater the ratio, the more likely dropout is to occur. Cox regressions assume that predictors influence the outcome equally at all time points; this proportionality of hazards assumption was fulfilled in our data, meaning our predictors equally influenced program adherence independent of how long participants had been eating according to their weight management rules at the time of the study. A major advantage of Cox regressions is that they make use of varying lengths of time periods in longitudinal studies: data of participants with an as-of-yet unknown outcome, who in our case were participants still involved in their weight management program at the last measurement point, are nonetheless considered in the odds ratios (Tabachnick & Fidell, 2007).

Results

Comparison of diets regarding their objective and perceived complexity

The *objective complexity* measures from the book analysis indicate that the Weight Watchers program is more cognitively complex than Brigitte (28 units vs. 2 units necessary to calculate and remember, respectively). Given the differences in cognitive processing required by the two programs, we also expected differences in *perceived complexity*, with Weight Watchers being higher. However, from the ratings of study participants, Brigitte and Weight Watchers rules do not differ significantly in this regard ($t(385) = 1.67$, $p = .10$; see Table 2 for means). This may be because people who are already following one of the programs feel that the regimen is acceptably difficult—otherwise they would not be on it. To test whether this active regimen participation makes a difference in perceived complexity judgments, we asked an additional 99 women (age: $M = 36.5$ years, $SD = 11.2$; body mass index: $M = 27.5$ kg/m^2, $SD = 6.9$) who had never followed either Brigitte or Weight Watchers to assess the complexity of both (using the same four measurement items; Cronbach's $\alpha = .79$ and $\alpha = .88$ for Brigitte and Weight Watchers, respectively); these unbiased participants rated Brigitte's perceived rule complexity to be significantly lower than that of the Weight Watchers program ($M = 2.73$ $SD = 0.86$ vs. $M = 3.21$ $SD = 0.69$; respectively, $t(98) = -4.26$, $p < .001$), matching our objective complexity comparison. Furthermore, among another 51 women who had done Weight Watchers and Brigitte, and thus had self-selected into *both* programs, they again perceived no difference in complexity between the diets (on an individual basis), just like the women in our main study following one diet or the other (compared at the group level; $N = 51$; $M = 2.81$ $SD = 0.77$ vs. $M = 2.58$ $SD = 0.80$; respectively, $t(50) = 1.52$, $p = .14$).

Adherence to different weight management programs

No significant differences were found in mean adherence times between the programs ($t(359) = 0.48$, $p = .64$). This is largely due to the great variance in adherence times within each program (see Table 2 for means and *SD*s). Furthermore, given the very small differences in mean perceived complexity ratings between followers of the two diets, we would consequently not expect mean adherence rates to differ between them. Instead, the critical

Table 2
Weight management program performance of participants.

	Brigitte *M* (*SD*)	Weight Watchers *M* (*SD*)	Difference: Brigitte – Weight Watchers
Time adhered to diet (weeks)	44.1 (172.00)	38.5 (45.30)	$t(359) = 0.48$, $p = .64$
Self-efficacy	2.54 (0.65)	2.72 (0.66)	$t(388) = -2.58$, $p = .01$
Intention	3.51 (0.53)	3.46 (0.52)	$t(388) = 0.80$, $p = .43$
Planning	3.22 (0.67)	2.97 (0.72)	$t(388) = -3.39$, $p = .001$
Goal attainment			
Weight	1.33 (0.48)	1.29 (0.46)	$t(70) = 0.32$, $p = .75$
Time	1.57 (0.60)	1.40 (0.53)	$t(69) = 1.19$, $p = .24$
Number previous diet attempts	5.95 (4.01)	7.13 (4.24)	$t(388) = -2.67$, $p = .008$
Perceived complexity (t1)	2.56 (0.74)	2.43 (0.69)	$t(385) = 1.69$, $p = .10$

Note. *N* for each cell: see Table 1.

Table 3
Correlation table for predictors included in the Cox proportional hazard regression.

	Previous weight loss attempts	Self-efficacy	Intention	Planning
Brigitte				
Self-efficacy	.08	–		
Intention	.13	.14	–	
Planning	.21*	.21*	.40*	–
Perceived complexity	.09	−.30**	−.09	−.21*
Weight Watchers				
Self-efficacy	−.04	–		
Intention	−.01	.12	–	
Planning	.09	.18**	.26**	–
Perceived complexity	−.07	−.15*	−.23**	−.18**

Note. All predictors refer to the first measurement point.
* $p < .05$.
** $p < .01$.

point seems to be the individual differences in adherence across followers *within* each weight management program, which we analyze next.

Perceived cognitive complexity as a predictor for the length of program adherence

To investigate the impact on adherence of individual differences between participants within the same weight management program, we ran hierarchical Cox hazard regressions with variables entered sequentially. Number of previous weight loss attempts was entered in the first step, followed by self-efficacy, intention, and planning in the second step. Lastly, perceived complexity of the weight management rules was added (see Table 3 for correlations between variables, and Table 4 for results on all predictors in the third step).

For participants on the Brigitte program, a higher number of previous weight loss attempts increased the odds to quit by 11%, and self-efficacy decreased these odds by 53%. Concrete planning decreased the probability to quit by 47%, which is marginally significant. Neither intention nor perceived cognitive complexity was a significant predictor. For participants on Weight Watchers, higher perceived complexity raised the probability of quitting by 54%. Self-efficacy marginally decreased the odds of quitting by 30%.

Table 4
Cox proportional hazard regression predicting dropout for individual programs.

Predictor variables	Wald statistic	Odds ratio	*p*	95% confidence interval of the odds ratio	
				Upper	Lower
Previous weight loss attempts					
Brigitte	4.48	1.11	.03	1.01	1.23
Weight Watchers	0.07	1.01	.79	0.95	1.07
Self-efficacy					
Brigitte	3.97	0.47	.05	0.22	0.99
Weight Watchers	2.77	0.70	.09	0.46	1.07
Intention					
Brigitte	0.01	1.05	.92	0.44	2.52
Weight Watchers	1.72	1.50	.19	0.82	2.75
Planning					
Brigitte	3.09	0.52	.08	0.26	1.08
Weight Watchers	1.86	0.77	.17	0.54	1.12
Perceived complexity					
Brigitte	0.04	0.93	.83	0.47	1.84
Weight Watchers	3.87	1.54	.05	1.01	2.36

None of the other factors was a significant predictor. To test whether these results might be influenced by outliers, we also ran all analyses again, omitting participants whose time on the current weight management program differed more than three standard deviations from the mean. These analyses showed no different outcomes from those including all participants.

In summary, as predicted, higher perceived rule complexity greatly increased an individual's likelihood of quitting the Weight Watchers regimen, a weight management program relying heavily on computation. It did not however matter for the Brigitte program, where objective cognitive complexity was low. In agreement with the literature, higher values on social-cognitive factors decreased the odds of stopping either weight management program unsuccessfully, whereas a higher number of previous weight loss attempts slightly increased the odds.

Taken together, results from the rule analysis and the Cox hazard regressions suggest that complexity of weight management rules (a) differs objectively between programs, and (b) has a negative subjective effect on the time participants adhere to a computationally demanding program. At the same time, *perceived* complexity was also rated as different for the two programs by women who had never followed either program, but as the same when rated by women who had already started one program or the other. It is possible that how complexity is perceived is influenced by not only the objective complexity of the rules, but also by non-environmental factors regarding the participants themselves, including social-cognitive characteristics, age, education, experience (i.e., number of previous weight management programs), or employment status (e.g., active vs. retired). In our analyses, only the social-cognitive factors were significantly associated with perceived complexity, and none particularly strongly (self-efficacy $r_{Brigitte} = -.30$, $r_{WW} = -.15$; intention $r_{WW} = -.23$; planning $r_{Brigitte} = -.21$, $r_{WW} = -.18$; all $ps < .05$; see Table 3).

Discussion

In this study we extended previous research on how characteristics of the environment influence eating behavior by considering both the structure and the perception of the cognitive environment, specifically testing the effect of a weight management program's rule complexity on adherence to that program. We compared the influence of perceived environment structure with that of social-cognitive factors on leaving a weight management program prematurely, and found that—in the Weight Watchers program with complex eating rules and thus heightened cognitive demands—perceptions of rule complexity had the greatest impact. The magnitude of this effect, and of the other significant odds ratios we found, were comparable to or larger than other observational studies on eating behavior using Cox hazard regressions. For instance, Dalle Grave et al. (2005) studied which factors predicted leaving a weight management program at 6 and 12 months and reported increases in odds ratios between 1.12 and 1.42, compared to ours ranging up to 1.54. In contrast, perceived complexity does not play much of a role for individual adherence to Brigitte, which also is in line with the findings from our rule analysis showing that this recipe-based program places little cognitive demand on followers.

At the same time, the two perceived complexity measures differ little *on average* between the groups of Weight Watchers and Brigitte followers. This lack of mean perceived difference could arise if people tend to self-select their weight management program such that it fits their (cognitive) abilities, leading to a sort of equilibrium in perceived difficulty at which people are able to stick to their eating rules for at least some amount of time. Our comparison of women who had been on both of the diets (thus had self-selected them, possibly based on their cognitive abilities) with

individuals who had not followed either diet supported this idea. The rule complexity perception of individuals inexperienced with both Weight Watchers and Brigitte reflected the results of our objective rule analyses showing that Weight Watchers rules are more complex. However, dieters who had followed both programs showed no difference in their perceived complexity of each. These findings suggest that on average people seem to choose diets that they perceive as not being too difficult. This also means that our study design was not likely to pick up differences in perceived complexity between diets due to this self-selection effect. We would expect to find a difference in perceived complexity between diets in a randomized controlled trial, where people are randomly assigned to different diets with rules of varying degrees of complexity and therefore cannot select a diet program that best suits their abilities—matching what we found with the inexperienced group who rated the diets without ever having followed them. However, this possibility still awaits further empirical investigation.

An additional explanation for not finding perceived complexity differences between diets could be that social-cognitive factors affected the perception of rule complexity in a way that resulted in comparable difficulty perception between the two weight management programs. We did find small but significant correlations between the social-cognitive factors and perceived rule complexity, raising the concern that perceived complexity is not measuring anything additional to those factors. However, perceived complexity does make an additional contribution to length of adherence to a weight management program after those factors were controlled for in the Cox hazard regressions, showing the unique importance of perceived complexity on dieting behavior.

Strength of intentions did not have a significant impact on program adherence, presumably because the intention to manage one's weight is a necessary precondition to start a weight management program. Because participants in our study were already attempting to lose weight, they had very high intention scores (90% of participants rated their intention strength at 3 or 4 on a 4-point scale); thus, with this little variance (i.e., a ceiling effect), intention could not be a meaningful predictor here.

While one limitation of our study is reliance on self-report measures, we designed it to reach a large, diverse audience of participants attempting to lose weight longitudinally, and the advantage is that the participants involved were motivated to take their self-reporting seriously and provide useful data. However, the important findings should certainly be followed up using other methods (e.g., controlled laboratory studies and randomized trials). This would also overcome the fact that participants on the Brigitte regimen in our study differed from those on Weight Watchers in a few aspects (though largely less important ones). To test the importance of perceived complexity across different subsamples (e.g., people with different diet experience, self-efficacy, or time vs. weight goals), future research could compare the role of perceived complexity for diet adherence across matched subsamples of dieters along with experimental manipulations of diet rules. Our study does not have enough power to detect differences in matched subsamples; for example, when we analyzed subgroups of dieters depending on how long they have been on the diet (e.g., comparing people who just started the diet with those that adhered to their diet longer and have more experience), the magnitude of odds ratios is comparable to those using the entire sample, but the effects are not significant. Furthermore, the two diet regimens also differ in types of additional support they provide to participants, such as weigh-ins or group meetings (which in our additional online study we found that approximately a third of the dieters make some use of). This has to be considered when interpreting the results.

Other studies have shown that the ease of making changes in eating behavior influences compliance with and maintenance of those changes and any subsequent weight loss, especially for changes related to the physical environment (e.g., Wansink, 2006). Wansink et al. (2009) suggested that instead of vigorously monitoring one's calories or other units of food intake, making small environmental changes that are easy to realize—such as using smaller plates, not eating while watching TV, or limiting snacks to three bites—could be very powerful contributors to successful weight control. Therefore, future studies comparing diet adherence should consider not only the role of cognitive rule complexity as explored in this paper—the ease of the cognitive environment—but also the ease with which weight-control related changes can be realized in a person's physical (or social) environment.

Conclusions

The long-term success of different weight management programs should be measured not just in terms of direct weight loss, but also, as here, in terms of how long people stick to their program. The underlying assumption is that staying longer on a healthful weight loss or weight management program increases the likelihood of controlling weight or achieving generally better health: short-term diets do not generate lasting effects (Mann et al., 2007), while successful weight management programs involve long-lasting lifestyle change, including nutritional changes (Powell, Calvin, & Calvin, 2007). Thus, designing weight management rules that can be adhered to for a long period or an entire lifetime—including by making rules that are not perceived as being too complex—could help limit the spread of overweight and obesity.

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