

The Role of Interpersonal Influence in Families in Understanding Children's Eating Behavior

A Social Relations Model Analysis

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Abstract

This study investigates children's eating behavior in a context of bidirectional parent–child influences. Parents and children were asked about their sense of influence and of being influenced concerning food rules. For parents, these feelings seemed to be partly correlated with children's eating behavior. Additionally, Social Relations Model analysis revealed that parents' and children's feelings of influence and being influenced were not only dependent on characteristics of the rater or actor, but also characteristics of the partner and of the unique relationship were found to be important. Furthermore, evidence was found for bidirectional influences, but only for the mother–older sibling dyad.

Keywords

- *children*
- *eating behavior*
- *interpersonal influences*
- *parent–child relationship*
- *Social Relations Model*

THE STUDY of factors affecting dietary behavior has predominantly focused on individual differences, although the role of environmental factors such as society, school, peers, and advertising have been highlighted in ecological models (Cullen et al., 2001; de Bruijn, Kremers, de Vries, van Mechelen, & Brug, 2007; Sallis & Owen, 1996; Vereecken, Ojala, & Delgrande Jordan, 2004). The role of parents in determining children's eating behavior has also been investigated, largely within a unidirectional, parent-to-child, causal orientation (Blissett & Haycraft, 2008; de Bourdeaudhuij, 1997b; Hughes, Power, Fisher, Mueller, & Nicklas, 2005; Kuczynski, 2003).

In most of these studies, the influence of the mother was the primary focus. However, the father and children also have influence. Mothers tend, for instance, to buy and prepare foods that their husband and children like (e.g. Mennell, Murcott, & van Otterloo, 1992). Rimal and Flora (1998) demonstrated that adults' and children's dietary behaviors were influenced by each other. The idea that parents and children make food choices within a system of mutual influence is consistent with other research on bidirectional influence in parent-child relationships (de Mol & Buysse, 2008; Lollis & Kuczynski, 1997). Interpersonal influence is not solely determined by characteristics of the person who is influencing; it is also affected by characteristics of the person who is influenced (Cook, 1993, 2001). The purpose of this study is to further investigate parents' and children's experiences of influence and being influenced within the domain of dietary behavior.

Prior research on the effect of parenting on children's eating behavior has conceptualized influence as setting rules (de Bourdeaudhuij, 1997a). This can take the form of forbidding certain foods (i.e. setting food restrictions) and by requiring them to eat certain foods (i.e. setting food obligations). Children, on the other hand, influence their parents by their efforts to elude these rules. In this study we will focus on parents' and children's beliefs about their influence on each other (*Effectance*), and also on their subjective sense of being influenced by each other (*Acquiescence*) with respect to dietary behavior. The extent to which parents feel successful in setting rules on their children's food consumption will be referred to as *Effectance Parents*, and the extent to which children feel able to elude the food rules of their parents will be referred to as *Effectance Children*. Additionally, the extent to which parents

feel influenced by their children's efforts to elude the food rules is termed *Acquiescence Parents*, and the extent to which children feel influenced by the food restrictions and obligations of their parents is termed *Acquiescence Children*. Measures of each of these constructs have been developed by modifying the Effectance and Acquiescence subscales of the Interpersonal Sense of Control Scale (Cook, 1993).

Previous research concerning interpersonal influence in families (e.g. de Mol & Buysse, 2008) showed that parents and children have a sense of influence on each other and that they are able to report about these influences. Consequently, we hypothesize that they also have a sense of influence on each other in the domain of eating behavior. Although parents and children are equally 'agentic', parents have more power (Kuczynski, 2003), so they should have a greater sense of control. Therefore, the mean score for parents' sense of influence (*Effectance*) is expected to be higher than the mean score for their sense of being influenced (*Acquiescence*). Conversely, children's mean score for their sense of being influenced by parents' rules (*Acquiescence*) will be higher than the mean score for their experience of being able to get around these rules (*Effectance*).

Public health research stresses the importance of food restrictions and obligations for children's eating behavior. Children eat healthier when their parents impose rules on their food consumption (de Bourdeaudhuij, 1997b). Therefore, we hypothesize that children who are successful in eluding their parents' food rules should have less healthy eating habits than children who are more obedient. So, children with a high score on *Effectance* should eat more unhealthy food and less healthy food. On the other hand, children with a strong sense of being influenced by their parents' food rules (i.e. high score on *Acquiescence*) should eat healthier. Accordingly, parents who have a strong sense of influence (i.e. high score on *Effectance*) will have children who eat more healthy food. Finally, parents with a strong sense of being influenced by their children's efforts to elude their rules (i.e. high score on *Acquiescence*) will have children who eat more unhealthy and less healthy food.

Because influence is not restricted to the person who is influencing, this study determines the extent to which parent and child characteristics are relevant in explaining the between-family differences in sense of influence (*Effectance*) and being influenced (*Acquiescence*). For instance, how much do child

characteristics influence parents' ability to regulate their children's dietary behavior? How much do parent characteristics determine whether the child feels able to elude parental food rules? The importance of these characteristics can be investigated using the Social Relations Model (SRM; Kenny & La Voie, 1984). For an extensive discussion of the SRM the reader is referred to Cook (1993, 1994) and Kashy and Kenny (1990). Although interpersonal influence has already been investigated with the SRM (Cook, 1993, 2001; de Mol, 2008), it has never been applied to family dietary behavior.

Parents are influencing their children's dietary behavior in a lot of ways. Therefore, we expect that parents' sense of influence will be, at least partly, determined by parent characteristics. In terms of the SRM, then there should be significant actor variance for parents. This means that differences between families in parents' sense of influence are, at least partly, determined by parent characteristics. However, from a bidirectional point of view, characteristics of children also play a role in the parents' manner of interacting with the child. Thus parents' sense of influence should also be determined by child characteristics. This would be indicated by significant partner variance for children. Finally, Cook (2001) found that parental influence was systematically determined by characteristics of the parent-child relationship. Thus, we expect the parent-child relationship variance to be significant too. For parents' sense of being influenced, we expect the same results.

Children also might vary across families in their ability to influence other family members and in their sense of being influenced by them. Thus, there should also be significant variance in children's actor factors. In addition, the child's influence on the parents is dependent on parental characteristics (Bugental & Shennum, 1984). So parents' partner factors are expected to be important factors in accounting for children's sense of influence. As for parents, it is supposed that characteristics of the specific child-parent relationship will explain part of the between-family differences in sense of influence and being influenced of children.

In sum, we expect significant actor, partner and relationship factors, both for parents and children and both for sense of influence and sense of being influenced. According to previous research (de Mol & Buysse, 2008) actor factors are expected to account for the largest amount of variance, followed by partner and relationship factors.

Additionally, we expect to find bidirectional influences for parents' and children's sense of influence and being influenced. Bidirectional influence is indicated as each person in the dyad influences the other. Effectance over the eating behavior of children is, for instance, bidirectionally determined if parental sense of influence is affected by the child's characteristics and if the child's sense of influence is affected by parental characteristics. This hypothesis will be supported if the variances for the parents' and the children's partner effects are significant (i.e. there are bidirectional influences at the individual level of analysis), or if the variances for the child-parent relationship effect and the parent-child relationship effects are significant (i.e. there are bidirectional influences at the dyad level of analysis) (Cook, 2001).

Methods

Participants and procedure

The sample included 70 two-parent two-child families in which the children were between 10 and 18 years of age ($N = 280$). Families were mainly recruited through the schools of the younger of the two children. Sixty-five primary schools in different regions in Flanders (urban and rural) were asked to participate. Nineteen schools agreed. All children in the two highest grades who met our selection criteria received a letter in which parents were informed about the study and were asked to participate (794 letters were distributed). From the 133 families who returned the answer form, 70 were contacted for a home visit. During this visit, parents signed an informed consent for themselves and gave the permission for their children's participation. Children were orally informed about the aim and procedure of the study. In the presence of the researcher, all family members completed the questionnaire, which existed in a parent and a child version. Both participating children received a €10 gift voucher.

All participating families lived in Flanders and were middle class Caucasian, with the exception of one Asian family. Most of the parents who participated were the biological parents, but one stepmother and three stepfathers also participated. Two mothers and three fathers lived only part of the time with the children. The mean age of the mothers was 42.59 years ($SD = 3.49$), and fathers' mean age was 44.51 years ($SD = 3.93$). Eighty-two percent of the mothers and 63 percent of the fathers received higher education (i.e. college). Family size ranged

from two to five children ($M = 2.61$, $SD = 0.77$). The mean age of the older sibling was 14.03 years ($SD = 1.47$, $range = 11-18$ years), and the mean age of the younger sibling was 11.19 years ($SD = 1.20$, $range = 10-15$ years). Ninety-six percent of the older siblings were in secondary school (grade 7-12) and 89 percent of the younger siblings were in primary school (grade 5-6). The older sibling sample consisted of 41 boys and 29 girls, the younger sibling sample included 26 boys and 44 girls. The Ethical Committee of the Faculty of Psychology and Educational Sciences of Ghent University approved this study.

Measures

Children's eating behavior Children's eating behavior was assessed using the food-related items of the Health Behavior in School-aged Children questionnaire (HBSC). This questionnaire is part of a cross-national study conducted in collaboration with the WHO (World Health Organization) Regional Office for Europe. Parents reported about food habits of their children and children answered the same questions about themselves. As a result, three ratings about a child's eating behavior were obtained (father's, mother's, and the child's rating). The questionnaire included items about the consumption of food items such as sweets, fruit and vegetables; eating snacks; watching TV during mealtime; and family food rules. For instance, father and mother answered the question 'How many times a week does your child eat fruit?' and the child answered 'How many times a week do you eat fruit?' The average of those three ratings was used as the food frequency score for fruit for that child. For this study, only the items concerning frequency of food consumption were used. Ratings of father, mother, and child were averaged and two sum scores were computed: a healthy score, that is, the frequency of children's fruit and vegetable consumption, and an unhealthy score, that is, the frequency of sweets, chips, and (diet) soft-drink consumption.

Sense of influence and being influenced

All family members' influences on children's eating behavior were investigated using a self-report questionnaire based on the Effectance and Acquiescence scale developed by Cook (1993). These scales were used by Cook to measure family members' 'sense of control' in their relationships. The Effectance scale indicates the extent to which family members

feel they have influence, the Acquiescence scale measures the belief that they are influenced by other family members. These scales were transformed to measure influences concerning eating behavior. Separate questionnaires were constructed for the parents and the children. Parents rated the two participating children and the children answered questions about their father and mother. The parent questionnaire assessed the extent to which parents feel successful in restricting and demanding their children to eat certain things (Effectance Parents) and the extent to which parents feel influenced by their children's efforts to elude these food rules (Acquiescence Parents). In the children's version, questions measured the extent to which children feel successful in eluding the restrictions and obligations of their parents (Effectance Children) and the extent to which children feel influenced by their parents' rules (Acquiescence Children).

Each scale included 12 items. Parents and children rated these items on a five-point Likert scale (from strongly disagree to strongly agree). In order to facilitate the use of the scales across different relationships, the target of the rating was identified by a dotted line in each item. Family members were instructed to mentally insert the name of the target where there was a dotted line. A distinction was made between questions about restricting children's consumption of unhealthy food and questions about demanding that they eat healthy food. The child version was tested in a limited pilot study. In the present sample, the coefficient α reliabilities (Cronbach's α) for the 12-item Effectance and Acquiescence scales of parents, averaged across the four relationships (two parents rating two children each), were .67 for Effectance ($range = .64-.72$) and .80 for Acquiescence ($range = .80-.81$). Averaged reliabilities for the children's scales were: Effectance .84 ($range = .82-.87$); Acquiescence .80 ($range = .77-.84$).

Design

The estimation of the parameters of the SRM requires specific designs. Most SRM studies have used round-robin family designs in which each family member rates each of the other participants on the same scales. In this study, parents and children were asked different questions. For example, parents were asked about how much they influence their children's eating behavior, but children were not asked about how much they influence their parents' eating behavior. Likewise, children were

asked how much they could elude their parents' influence, but parents were not asked about their ability to elude their children's influence. When each subgroup of respondents (e.g. parents) rates only the other subgroup (e.g. children) on a different set of items, it constitutes a half-block design. For any given measure (e.g. child Effectance) one can obtain estimates of the SRM actor, partner, and relationship factors from a half-block design, but the family factor and the reciprocity correlations cannot be estimated.

Missing data

Questionnaires were administered at home and checked immediately after the participants had completed the task so that missing data could be largely prevented, resulting in few invalid cases. For parents' data, one case was excluded because the father did not want to fill in all the items. For children's data, three cases were excluded. In two of the families the child did not report on the relationship with father. The third case was excluded because three items were missing for each relationship. When no more than two items were missing within a particular relationship, these data points were replaced using the mean of the other items. This procedure was applied 14 times for parents' data and 24 times for children's data.

SRM analysis

The SRM components (i.e. actor, partner, and relationship factors) were specified as latent variables in a confirmatory factor analysis. The observed measures (i.e. the Effectance and Acquiescence scale scores) were forced to load on the respective SRM factors. In this way information was provided regarding the amount of variance in the observed measures accounted for by each factor. Factor loadings were usually fixed at 1.00. For each SRM analysis, eight latent variables were specified. For the analysis of parents' ratings, actor factors were constructed for mother and father, partner factors for older and younger sibling, and four relationship factors (mother–older sibling, mother–younger sibling, father–older sibling and father–younger sibling). For example, a measure of mother's Effectance in relation to the older sibling loads on mother's actor factor, the older sibling's partner factor and the mother–older sibling relationship factor. For children's ratings, actor factors were constructed for older and younger sibling, partner factors for mother and father and

four relationship factors (older sibling–mother, older sibling–father, younger sibling–mother, and younger sibling–father).

In order to identify SRM relationship factors as distinct from residual variance, it is necessary to have two indicators for each relationship (e.g. two indicators of mother's Effectance with older sibling, two indicators for father's Effectance with older sibling, and so on). This was accomplished by splitting the scales so that half the items for each scale were averaged to create one indicator (or subscale) and half the items were averaged to create the other indicator (Cook, 1993). Consequently, each analysis contained eight dependent variables; two indicators for each of the four relationships. All the residual variances related to a particular subscale or indicator were allowed to correlate. This procedure controls for method variance due to the use of the same six items.

Results

Mean scores for Effectance and Acquiescence

As we expected, mean scores for Effectance and Acquiescence confirmed that both parents and children reported having a sense of influence and a sense of being influenced. With mothers' and fathers' scores combined to get a parent score and the same for the older and younger siblings' scores, our expectations were confirmed: parents' mean scores for Effectance are higher ($M = 3.7$) than their mean scores for Acquiescence ($M = 2.4$): $t(68) = 17.96, p < .01$. Conversely, for children, the mean scores for Acquiescence ($M = 3.6$) are higher than their mean scores for Effectance ($M = 2.3$): $t(66) = -13.15, p < .01$.¹

Correlations between Effectance/ Acquiescence and eating behavior

We expected that parents' feeling that they can influence their children's eating behavior (parents' Effectance) would be associated with a healthy diet of their children. This hypothesis was partially supported. Mothers' sense of influence (Effectance) was negatively correlated with the older siblings' unhealthy food score ($r(63) = -0.28, p = .02$) and fathers' sense of influence was negatively correlated with the younger siblings' unhealthy food score ($r(65) = -0.26, p = .03$). However, these correlations should be carefully interpreted; an

alternative interpretation is that parents feel less influence if their children eat unhealthy foods.

As expected, mother's Acquiescence to the older sibling was negatively correlated with the child's healthy eating behavior ($r(68) = -0.29, p = .02$) and positively correlated with the child's unhealthy eating behavior ($r(63) = 0.27, p = .03$). These results indicate that mothers' feeling that they are influenced by their children's efforts to elude their food rules is associated with a less healthy diet of the older children (i.e. fewer healthy and more unhealthy food items consumption). However, no correlations were found between father's feeling of being influenced and the older sibling's eating behavior, and neither mother's nor father's feeling of being influenced was correlated with the younger sibling's eating behavior.

For children's scores, none of the correlations was significant.

SRM analysis

In our half-block design, the two individuals from a particular generation rated their relationships with each of the two individuals from the other generation. For example, mother and father each rated their control over the older sibling's and the younger sibling's eating behavior (i.e. Effectance). Four SRM analyses were performed on the scale scores of the Effectance and Acquiescence scales, for parents and children separately. Structural equation modeling (EQS 6.1; Byrne, 2006) was used to conduct these analyses. When a component of the SRM is found to have significant variance, it means that the component is a significant source of variance in any of the measured variables that load on it.

The goodness of fit of the SRM for each construct was evaluated using three widely accepted fit indices: the chi-square value, the RMSEA (Root Mean-Square Error of Approximation), and the CFI (Comparative Fit Index). A CFI of .90 or higher (Byrne, 2006) and values of the RMSEA between .05 and .08 indicate an acceptable fit of the model (Browne & Cudeck, 1992). Three of the four initial estimated models did not fit well. Post hoc analyses revealed that these models would have a better fit with the correlation between the actor factors included. This seemed a reasonable addition to the model because parents as well as siblings are expected to be similar to each other. For instance, assortative mating (i.e. selecting a spouse based on either similarity to or difference from oneself) can result in correlations between mother's and father's

actor factors (Cook, 2001). Consequently, these models were re-estimated with the intragenerational similarity correlations included, which resulted in a good fit. The results of the SRM analysis are reported in Table 1.

Parents' Effectance Fit indices of the initial model (i.e. without correlated actor factors) to the data indicated a good fit: $\chi^2 (8, N = 69) = 10.22, p = .25$; CFI = .99; RMSEA = .06. Post-hoc analysis did not reveal meaningful additional covariances. Actor factors for both parents' Effectance were significant, indicating that each parents' sense of influence on their children is affected, at least in part, by characteristics of the parent who is the rater or actor. Mothers and fathers vary significantly in their feeling that they succeed in setting rules on their children's food consumption. The partner factor of the older sibling was also significant, indicating that parents' sense of influence on their older child's food consumption depends in part on characteristics of the child. Although we expected the relationship factors to be significant, this was only true for one relationship. Mother's sense of influencing the younger sibling's food consumption was affected by the unique relationship between mother and the younger sibling.

Children's Effectance The initial fit of the SRM was not acceptable: $\chi^2 (8, N = 67) = 15.79, p = .05$; CFI = .98; RMSEA = .12. The fit of the model with the actor correlation included was very good: $\chi^2 (7, N = 67) = 4.71, p = .70$; CFI = 1.00; RMSEA = .00. Actor factors of both children were significant. Children's sense of being able to elude the food rules of their parents was determined, in part, by characteristics of the child. In other words, some children have a strong sense of influence, other children have this feeling less. The significant correlation between children's actor factors, $r(65) = .56, p < .05$, indicates intragenerational similarity. The more one sibling has a sense of influence on his or her parents, the more the other sibling has this feeling too. The partner factor for mothers was also significant. Children's sense of being able to influence mother is affected, at least in part, by characteristics of the mother. Some mothers are more influenceable than others. Relationship factors of the older sibling with both parents were significant. The older sibling's sense of influence with each parent is affected by the unique relationship of this child and each parent, independent of the child's general sense of influence or how influenceable the

Table 1. Variance estimates and standard errors (in brackets) of SRM-factors for Effectance and Acquiescence (concerning food rules)

Factor	Parents		Factor	Children	
	Effectance	Acquiescence		Effectance	Acquiescence
Actor			Actor		
Mother	.06** (.03)	.13** (.03)	Older sibling	.25** (.06)	.19** (.05)
Father	.06** (.02)	.15** (.04)	Younger sibling	.17** (.05)	.22** (.05)
Partner			Partner		
Older sibling	.02** (.01)	.02* (.01)	Mother	.05** (.03)	.04** (.02)
Younger sibling			Father		
Relationship			Relationship		
Mother–Older S ^a			Older S–Mother	.06** (.03)	.08** (.03)
Mother–Younger S	.03** (.01)	.04** (.02)	Older S–Father	.06** (.03)	
Father–Older S			Younger S–Mother		
Father–Younger S		.03** (.02)	Younger S–Father	.07** (.03)	

Notes: Only significant variances are reported

^a S is sibling

* $Z > 1.29$, $p < .10$ (one-tailed test that variance is greater than 0); ** $Z > 1.65$, $p < .05$ (one-tailed test that variance is greater than 0)

parent is. The relationship factor of the younger sibling with father was also significant. The younger sibling's Effectance is affected by the unique relationship with father.

Bidirectionality of Effectance Bidirectional influences are indicated if each person in a dyad affects the other. In terms of the SRM, bidirectional influence at the individual level is indicated if the partner effects for both dyad members are significant, and at the dyadic level, if each person's unique adjustment to the other (i.e. the relationship effects) is significant (Cook, 2001). In a round-robin family design, these estimates would come from the same analysis. In the half-block design, however, each dyad member's partner effect is estimated in a different analysis. For example, the older child's influence on mother's Effectance measure comes from the analysis of parental Effectance scores. However, the mother's influence on the child's Effectance comes from the analysis of the children's Effectance scores. Bidirectionality at the dyadic level is similarly based on results of two separate analyses.

At the individual level of analysis first, we consider the partner effects for mother and older sibling Effectance. Both the mother and child partner effects have significant variance. Because both partner effects are significant, there is bidirectional influence for Effectance at the individual level of

analysis in the mother–older sibling dyad. At the dyadic level of analysis, there was significant relationship variance for the older sibling's Effectance with the mother, but the mother–older sibling relationship variance was non-significant. Consequently, there was no bidirectional influence on Effectance in the mother–older sibling dyad at the dyadic level of analysis. Because one of the two reciprocity correlations had non-significant variance, there was not support for bidirectional influence at the individual or dyadic levels for the mother–younger sibling dyad, the father–older sibling dyad, or the father–younger sibling dyad.

Parents' Acquiescence The fit of the initial model was not adequate: χ^2 (8, $N = 69$) = 14.55, $p = .07$; CFI = .97; RMSEA = .11. The modification index indicated that a better fit would be obtained if the parents' actor effects were allowed to correlate. With this modification the fit of the model was excellent: χ^2 (7, $N = 69$) = 6.45, $p = .49$; CFI = 1.00; RMSEA = .00. The variances of the actor factors for both parents' Acquiescence were significant. Parents' sense of being influenced by their children's efforts to elude their food rules in part reflects characteristics of the parents themselves. In this respect, the parents are similar to each other, as indicated by the significant correlation between their actor effects, $r(67) = .52$, $p < .05$. The more one parent feels influenced by the children, the

more the other parent feels influenced too (intra-generational similarity).

As with the Effectance scale, only the older sibling's partner factor was significant. So older siblings vary in the extent to which they affect their parents' sense of being influenced. Relationship factors of both parents in relation to the younger sibling were significant. Parents' sense of being influenced by the younger sibling was affected by characteristics of the unique relationship of each parent with that child.

Children's Acquiescence As with the parents' Acquiescence, the fit of the model for children's Acquiescence was not adequate: $\chi^2 (8, N = 67) = 14.19, p = .08$; CFI = .99; RMSEA = .11. The modification index indicated that a better fit would be obtained if the actor effects for the children were allowed to correlate. With this adjustment, the fit of the model was excellent: $\chi^2 (7, N = 67) = 6.98, p = .43$; CFI = 1.00; RMSEA = .00. Actor factors of both children's Acquiescence were significant. Children's report of being influenced by their parents' food rules is affected, in part, by characteristics of the child who is the rater or actor. The significant correlation between the actor factors indicates intragenerational similarity, $r(65) = .46, p < .05$. The more one child feels acquiescent, the more the other child feels acquiescent. Mother's partner factor was also significant. Mothers differ in the extent to which they affect their children's sense of being influenced. The only significant relationship factor was for the older sibling–mother relationship. The older sibling's sense of being acquiescent to the mother is affected by characteristics of the unique relationship with mother, independent of the older sibling's general sense of being influenced or the mother's ability to make both children feel her influence.

Bidirectionality of Acquiescence As for the Effectance scale, bidirectional influences are investigated both at the individual and at the dyadic level. For the mother–older sibling dyad, the older sibling partner and the mother's partner effect had significant variance. Because both partner effects are significant, there is bidirectional influence for Acquiescence at the individual level of analysis in the mother–older sibling dyad. At the dyadic level of analysis, there was significant relationship variance for the older sibling's Acquiescence with the mother, but the mother–older sibling relationship variance was not significant. Consequently, there was no bidirectional influence on Acquiescence in

the mother–older sibling dyad at the dyadic level of analysis. There was not support for bidirectional influence at the individual or dyadic levels for the mother–younger sibling dyad, the father–older sibling dyad, or the father–younger sibling dyad.

Discussion

Parents' and children's ratings of Effectance and Acquiescence

Overall, our hypotheses were confirmed: parents' and children's Effectance scores indicated that they both have a feeling of influence in the context of eating behavior. The means are around midpoint of the five-point scale, indicating that the average parent feels some degree of control over the children's food consumption. This finding is in line with earlier research in which parents' numerous influences on children's eating behavior, such as setting rules, have been highlighted. However, children also have the feeling that they succeed in eluding their parents' food rules, and both parents and children have a sense of being influenced. Parents feel influenced by their children's efforts to elude their rules and children feel influenced by their parents' food rules.

When comparing parents' Effectance and Acquiescence scores, it becomes clear that parents' sense of influence is larger than parents' sense of being influenced. For children, the reverse pattern was found. So parents feel they are in control, children feel that their parents are in control. This complementarity of parents' and children's sense of control corresponds to the asymmetry of power in parent–child relationships (Kuczynski, 2003). Cook (1993) also found that parents feel more acquiescent to each other than to their children, and children feel more acquiescent to their parents than to each other. However, an alternative interpretation for this difference between parents and children could be the different meaning of parents' and children's Effectance and Acquiescence. Parents' Effectance was conceptualized as parents' sense that they are able to set rules; children's Effectance was defined as children's sense of being able to elude these rules. Parents' Acquiescence was defined as their sense of being influenced by their children's attempts to elude the rules. Children's Acquiescence was defined as their sense of being influenced by their parents' rules. It is possible that the reason children's sense of Effectance is lower than their sense of Acquiescence is that it may be more difficult for

them to elude a rule than for their parents to set a rule by which the children are influenced.

Link between Effectance/Acquiescence and children's eating behavior

The next question we investigated was: Is this sense of influence and being influenced related to the children's actual eating behavior? We expected that children who are successful in eluding their parents' food rules (i.e. high score on Effectance) should have less healthy eating habits than children who are more obedient. On the other hand, children with a strong sense of being influenced by their parents' food rules (i.e. high score on Acquiescence) should eat healthier. Accordingly, parents who have a strong sense of influence (i.e. high score on Effectance) will have children who eat more healthy food. Finally, parents with a strong sense of being influenced by their children's efforts to elude their rules (i.e. high score on Acquiescence) will have children who eat more unhealthy and less healthy food.

These hypotheses were partly confirmed: a negative correlation between Effectance and unhealthy eating was found for the mother–older sibling and father–younger sibling relationship, indicating that the older and younger siblings eat less unhealthy food if respectively mother and father have a larger sense of influence. Significant positive correlations were also found for mother's Acquiescence to the older sibling's unhealthy eating behavior and negative correlations with the older sibling's healthy eating behavior. When mothers feel strongly influenced by their older children's attempts to elude the food rules, the older children will eat unhealthier. The absence of significant correlations with children's eating behavior for father's Effectance and Acquiescence scores (with one exception for fathers' Effectance with younger sibling's eating behavior) supports the view that fathers are peripheral to the issue of getting children to eat healthily, and that mothers have the central role. For children's Effectance and Acquiescence scores no significant correlations were found with eating behavior.

The correlations between parents' Effectance/Acquiescence and children's eating behavior may not be interpreted as causal relations. The direction of the effect is not clear. It could be that parents feel less Effectance if their children eat unhealthy foods, as an alternative to the interpretation that 'effective' parents can reduce their children's unhealthy eating. Although the correlations between

parents' Effectance/Acquiescence and children's eating behavior are not large, they indicate that parents' sense of influence and their sense of being influenced are both related to children's food consumption. The extent to which parents feel they are able to set rules on their children's food consumption is related to children's unhealthy food consumption, and the extent to which mothers are influenced by their children's efforts to elude these rules is associated with children's healthy and unhealthy food consumption. These results are consistent with the view that parents are not the only source of influence on children's eating behavior. Children themselves also have an influence on their parents, and consequently on their own food consumption.

Determining factors of Effectance and Acquiescence

The SRM analyses revealed that, both for parents and children, characteristics of the rater (i.e. actor effects) are the most important predictors of Effectance and Acquiescence scores, relative to the other SRM factors. This finding is in line with other family SRM studies (Buist, Dekovic, Meeus, & van Aken, 2004; Cook, 2000). The significant actor factors indicate that some parents or children have a stronger sense of Effectance and/or Acquiescence than others. The SRM analysis does not address the question why it is that in some families, for instance, mothers have a stronger sense of Effectance than in others. It does not tell which characteristics of mothers (e.g. personality or eating habits) are responsible for these differences. The SRM indicates only that mothers do vary across families in their average level of sense of influence. An understanding of the causes of this variance would be helpful.

The methodology used in this study—a self-report questionnaire—is one possible explanation for the large amounts of actor variance. As in the study of de Mol (2008), family members were explicitly asked about their sense of influence and sense of being influenced regarding food rules. The actor effect is affected not only by the variable being measured (e.g. Effectance), but also by rater bias. The combination of these factors may result in large actor variances.

Although accounting for less variance than actor effects, partner effects were also important, but not for all family members. Only mothers' and older siblings' partner factors were significant, indicating that characteristics of mothers and older siblings are

important in explaining between-family differences in the Effectance and Acquiescence scores of family members who interacted with them. These findings are consistent with earlier research showing that partner factors are important in accounting for individuals' subjective sense of control in their family relationships (Cook, 1993). In Cook's study, all of the partner factors accounted for a considerable amount of variance in the Effectance scores. For the Acquiescence scores, both mothers' and fathers' partner factors were significant. The large number of significant partner factors is in contrast to the rather limited partner variance in our study. The effect of using slightly different and more specific scales could be one explanation for this difference. Although in both studies the scales measured a sense of control, it could be that what our scale measured is less affected by the personality (or individual differences) of the partner. Another possible explanation is that our sample included fewer families, thus making it harder to detect small but systematic partner effects. In either case, a qualitative interview with the subjects could shed further light on this issue.

Some relationship factors were also found to be important predictors of Acquiescence and Effectance. For some family members, their sense of influence is thus at least partly relationship-specific and not only dependent on characteristics of parents and children. That relational aspects are important has also been found in earlier studies concerning the effect of parenting on children's eating behavior. For instance, the effect of parental control differs in families with a high or low level of cohesion (de Bourdeaudhuij & van Oost, 1998). However, in our study, it is not possible to determine what kind of relational aspects are responsible for the significant variance of some relationship factors. Future research should address this question.

In addition, intragenerational similarity was found for three of the four scales, as indicated by significantly correlated actor effects. For Acquiescence, mothers and fathers tended to be similar to each other in the extent to which they have a sense to be influenced; the more one parent feels influenced, the more the other feels influenced too. For children, actor correlations were found for both Effectance and Acquiescence. This means that older and younger siblings are similar in the extent to which they have a sense of influence in relation to their parents and a sense of being influenced by their parents.

Our hypothesis that there would be bidirectional influence on Effectance and Acquiescence was partially confirmed. At the individual level of analysis, bidirectional influence on Effectance and Acquiescence was found in the mother-older child dyad. Mother's Effectance and Acquiescence in relation to the older child were both significantly affected by the older child's partner effect for these variables, and the older child's Effectance and Acquiescence in relation to the mother was significantly affected by the mother's partner effect. For the mother-younger sibling dyad and for the dyads of father with older and younger sibling, no bidirectional influences were found at all. Further research is needed to investigate why bidirectional effects were found only for mothers and older siblings.

In summary, our results indicated that both parents and children have a sense of influence and of being influenced concerning eating behavior. Moreover, parents' Effectance and Acquiescence scores were partly correlated with children's eating behavior. This indicates that parents' food rules are related to children's diet. The impact of these rules is not only dependent on actor characteristics, but also on partner and relationship factors. However, it remains unclear which specific individual and relational characteristics are responsible for these results. Finally, the significant partner factors for both mothers and older siblings indicate the existence of bidirectional influences on Effectance and Acquiescence, but only for the mother-older sibling dyad.

In practical terms, that parent characteristics, child characteristics, and unique relationship characteristics determine these feelings of influence supports a family systems orientation to interventions aimed at improving healthy eating habits in families. The same may be true for therapy programs for children with overweight and eating disorders. The mother-older sibling dyad deserves special attention in prevention and therapy because of the bidirectional effects on their feelings of influence and being influenced. However, further research is needed to investigate how these interventions should be optimally designed.

Note

1. No significant differences were found between the combined and separate mean scores.

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