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Habits Across the Lifespan

Jeffrey M. Quinn and Wendy Wood

Duke University

Abstract

Although daily routines are part of the fabric of everyone's lives, some people's lives are more structured by habits than others. To examine lifestyle variations in habitual behavior, we conducted a diary study with a community sample. We anticipated that habit performance would increase with respondents' age, given characteristic changes in older people's cognitive ability and lifestyle that likely increase reliance on habits. Instead, age was indirectly associated with habits, through its effects on two aspects of lifestyle, employment and living arrangements. Specifically, employment increased the proportion of habits, whereas living with others (marginally) decreased this proportion. Because age was significantly linked with employment and household size in our sample, the conflicting effects of these two lifestyle factors on habits accounted for the overall lack of a relation between age and habit performance.

Habits Across the Lifespan

Everyday behaviors are patterned into sequences that are performed at particular times in customary places. Actions become incorporated into series of well-practiced responses that reflect continuities in past experience. For example, most people sleep and wake at regular times each day and develop morning and evening routines around behaviors such as grooming, eating, and watching television. Practice of these activities yields habits, which we define as behavioral tendencies to repeat responses given stable supporting contexts (Wood, Quinn, & Kashy, 2002).

Casual observation suggests that people vary in the extent to which their everyday lives are structured with habits. Whereas some people tend to repeat a limited set of well-practiced actions, others engage in a wider variety of novel behaviors. Age is one factor that might influence habitual patterns. Social stereotypes characterize elderly people as set in their ways and rigid in the sense of being traditional, conservative, stubborn, and closed-minded (Bargh, Chen, & Burrows, 1996; Blanchard-Fields, Hertzog, Stein, & Pak, 2001; Brewer, Dull, & Lui, 1981; Heckhausen, Dixon, & Baltes, 1989; Reich & Zautra, 1991). Reasoning from these social beliefs, aging is likely to be accompanied by an increased propensity to repeat past actions and follow a structured lifestyle.

In this article, we report a diary study of the everyday behavior of a community sample of participants that investigated age-related differences in habit performance. Our interest is in behavior as it is structured in daily life (Rozin, 2001). The descriptive, ecological approach we use in this research recognizes that context shapes behavior and cognitive processes (Neisser & Libby, 2000), and aims to demonstrate how habit performance varies according to social roles and situations.

Habits and Individual Differences

Repetition of behavior in stable circumstances yields automaticity in responding as associations develop in memory among aspects of circumstances, behaviors, and goals that co-occur in time and space and that possess similar features (Aarts & Dijksterhuis, 2000a, 2000b).

Connectionist network models provide a plausible way of thinking about how this kind of associative system operates (McClelland, 2000; Smolensky, 1988). In these accounts, whole patterns of co-occurring events can be represented in memory in terms of connection weights between units of processing (e.g., neurons). That is, with repetition, behaviors, goals, and circumstances can become linked through "coincident activation" of the respective connection weights (McClelland, 2000, p. 584). Subsequent presentations of aspects of the learned pattern will promote reconstruction of other aspects, as this pattern is filled-in on the other processing units. Through such associative mechanisms, people can efficiently execute whole sequences of responses with minimal deliberation when current circumstances are similar to those that have occurred with the actions in the past.

The minimal deliberation that is required for habit performance should make habits especially appealing to people who do not enjoy effortful thought and evaluation. To the extent that people prefer not to deliberate, they are likely to structure their daily lives with habits. Wood et al. (2002, Study 1) found some support for this idea in a diary study in which college students reported once per hour on their thoughts and behaviors. Students whose diary reports reflected a high proportion of habitual behaviors also scored slightly lower on self-report measures of two dispositions: *need for cognition* (Cacioppo, Petty, & Kao, 1984), reflecting people's chronic tendencies to engage in and enjoy cognitive activity, and *need to evaluate* (Jarvis & Petty, 1996), reflecting people's chronic tendencies to view events with favor or disfavor. However, these relations between personality and habit performance were only marginally significant in this investigation and have not emerged consistently across studies (Wood et al., 2002, Study 2).

Given that habits are a component of everyday lifestyles, a more promising strategy for identifying individual differences in habit performance involves investigating demographic and lifestyle characteristics. Illustrating this approach, the present study investigated age differences in

habit performance. As we explain below, age may have direct effects on habit performance, due to variation in cognitive skills and social motivations across the lifespan. In addition, age-related changes in habit performance might emerge indirectly through the effects of changing life circumstances that covary with age, such as those involving work and family roles.

Effects of Age

The idea that behavior is increasingly determined by habits as we age is consistent with older adults' diminished ability at tasks involving explicit memory. Older adults, compared with younger ones, tend to perform worse on explicit memory tests including recall, prospective memory, and working memory, but perform equivalently on implicit memory tests involving priming and habitual associations (Grady & Craik, 2000; Hay & Jacoby, 1999). To the extent that older adults have a diminished ability to guide behavior explicitly, they may rely on habits and other less thoughtful guides to action. Age-related impairments also might reduce available cognitive resources to cope with stress. For this reason, older adults might prefer a conservative lifestyle that embraces repetition of familiar behaviors and eschews possibly stress-inducing novel experiences (Reich & Zautra, 1991).

Aging also brings changes in social motives that might alter people's preferences for novelty versus familiarity in interpersonal interactions and thereby their reliance on habits. According to Carstensen, Isaacowitz, and Charles (1999), young people tend to engage in novel activities with a relatively large group of acquaintances, in part to gain knowledge and prepare for future social behavior. In contrast, people in mid-to-late adulthood prefer to interact with a smaller group of familiar partners, presumably to experience emotional satisfaction in the present. Such an interaction style might involve more repeated behavior. In general, then, for reasons of cognitive ability and motivation, older people might be especially likely to repeat past responses.

Age and correspondence between thoughts and behavior. The automatic nature of habits allows people to perform such activities with only minimal or sporadic monitoring and leaves people free to think about issues unrelated to ongoing behavior. In contrast, because nonhabits require greater thought for successful performance, people's thoughts typically correspond more closely to their nonhabitual actions. These ideas received support from Wood et al.'s (2002) diary studies in which college-aged participants were more likely to think about their behavior while performing nonhabits (about 60-70% of the time) than while performing habits (approximately 40-44% of the time). If habit performance increases with age, then older people should be less likely than younger people to think about their actions.

Effects of Life Circumstances

As adults age chronologically, they also progress through various life stages associated with family life and career advancement. The various stages are associated with characteristic experiences, tasks, and social roles that help to shape people's thoughts and behaviors (Feldman, Biringen, & Nash, 1981; Hess, 1994; Neugarten, 1968; Singleton & Harvey, 1995) and potentially to influence the extent to which their actions are habitual. As we explain below, variation in family and employment roles are especially likely to be associated with habit performance.

Investigation of life situations is not only fruitful in its own right, but also it can provide insight into the effects of aging. As Feldman et al. (1981) argued, "chronological age per se is not always a meaningful predictor of life experience, given the disparate rates at which individuals develop" (p. 25). Thus, to the extent that life circumstances are associated with age, analysis of these circumstances can help to explain age effects. In the present research, we considered whether participants' work and family circumstances varied with age in ways that can explain age effects.

Employment. Employment roles are likely to affect habit performance because they structure workers' daily lives. In support of this idea, Friedman and Havighurst (1954) argued that

> [one's job] often requires that he be in a certain place of work. It determines to a large extent where, when, and how he is to spend a major part of his life. So, the job has at least two functions: one of providing income or economic return, and the other of regulating the worker's pattern of life-activity (p. 4).

On the job, repetition of common work tasks yields employment-related habits (Gersick & Hackman, 1990; Weiss & Ilgen, 1985). In addition, employment increases habit performance beyond the 9-to-5 work day by structuring when people wake and sleep, their means of transportation to and from work, and the individuals with whom they interact.

Employment roles likely vary across the lifespan, and this variation in daily activities could contribute to age-related differences in habit performance. According to 1995 multi-nation data, part-time employment is most prevalent among teens and young adults (ages 15-24) and among older workers (age 55 and older), both groups that are transitioning into the workforce or into retirement, respectively (Delsen, 1998). In contrast, full-time employment is most typical during middle-adulthood. Thus, any effects of employment on habits might vary with age such that habit performance is greatest during midlife and less during early and late adult years.

Household composition. In addition to employment, household composition has implications for habit performance. Specifically, to the extent that housemates' activities are interdependent, the number of housemates may affect the prevalence of habitual behavior. When people depend on each other to perform daily activities, their routines become vulnerable to disruption by each others' actions. These disruptions can reduce the automatic repetition of past routines and force people to tailor their responses to the new (interrupted) situation (Berscheid, 1983). Thus, low levels of habit performance are likely to be found in larger households.

To the extent that patterns of living with others vary across the lifespan, then household composition could contribute to age-related differences in habit performance. Data from a 1995

survey of 2503 American adults aged 18-95 indicated that average household size increases among young adults, peaks in the decade of the 30s, and then decreases again in older years (Mirowsky & Ross, 1999). This tendency emerges in part from the greater likelihood of adults under age 50 to live with children. Thus, any effects of household composition on habits might vary with age such that habit performance is greatest in early and late years when people are most likely to live alone or in smaller households. In middle age, when people tend to live in larger, more interdependent households with children, then habits can be expected to decline.

The Present Research

In the present study, we examined the prevalence of habits across the lifespan using a diary methodology in which a community sample of participants made hourly reports on their behaviors and thoughts for two days. We anticipated two possible outcomes. First, aging might have a direct effect on habit performance. This would occur if the cognitive and motivational changes that accompany aging predispose older adults more than younger ones to follow established routines. Alternatively, aging might have an indirect effect on habit performance, through age's effects on such lifestyle features as employment and household composition. Specifically, hours worked outside the home and numbers of housemates are both likely to peak in middle age relative to earlier and later years. Furthermore, there is reason to assume that employment is associated with greater habit frequency whereas housemates have the opposite effect—they challenge the smooth repetition of past behavior and decrease habit frequency. We anticipated, then, that the competing effects of these two aspects of life circumstances across adulthood might cancel each other, so that age has no apparent effect on habit performance.

Method

Participants

A community sample of 100 participants (66 women and 34 men) in a southwestern US city took part in the study. Participants ranged in age from 17 to 79 (M = 34.3, SD = 13.88), and were recruited from a local fitness club (e.g., club members, members' friends and family, club employees). Participants received $50.

Procedure

The study consisted of three phases: an introductory session, a two-day recording period, and a follow-up session to collect diary reports. Participants provided additional data via telephone surveys several months after completion.

Phase 1: Introductory session. At an introductory meeting, the experimenter explained that participants would track their behaviors, thoughts, and feelings hourly for two days, excluding when they slept. Participants received copies of the diary forms, examples of correct entries, and a wristwatch that signaled hourly. To ensure accuracy, participants were to make their entries while the events occurred rather than retrospectively. Participants then scheduled a follow-up session and were excused.

Phase 2: Recording behaviors, thoughts, and feelings. Participants carried the diary forms with them throughout their daily activities. They recorded information concerning their behaviors, thoughts, and feelings once per hour (see *Measures*).

Phase 3: Follow-up session. Participants attended a follow-up meeting in which they submitted their diaries and received payment. They then indicated whether they had reported any events retrospectively.[i] Finally, participants were debriefed and excused.

Telephone survey. Participants were contacted by telephone several months after completing the study. Eighty-three of the 100 participants reported on aspects of the their lifestyles at the time of the diary procedure (see *Measures*).

Measures

Diary behavior reports. For each hourly diary entry, participants recorded their location and all of the behaviors in which they were engaged at the moment of the watch signal. For each behavior, participants rated: (a) the frequency with which they had performed the behavior in the past month, with response options 1 (*monthly or less often*), 2 (*at least once a week)*, or 3 (*just about every day*); (b) the extent to which they performed the behavior in the same location each time, from 1 (*rarely*) to 3 *(usually*); (c) the amount of attention required for performance, from 1 (*almost no attention*) to 4 (*constant attention*); (d) the difficulty of the behavior, from 1 (*very easy)* to 5 (*very difficult*); and (e) the importance of the behavior with respect to achieving personal goals, from 1 (*unimportant*) to 5 (*highly important*). In addition, participants reported for each hourly entry their experience of emotions such as boredom and stress, from 1 (*not at all*) to 5 (*extremely*).

Following past research (Ouellette & Wood, 1998; Wood et al., 2002), we operationalized habit based on frequency of past performance and stability of the supporting context. In the analyses, habits were defined as behaviors participants reported performing "just about every day" and "usually in the same location." Nonhabits were behaviors performed less often (i.e., weekly or monthly) or in less stable contexts (i.e., rarely or sometimes in the same location).

Diary thoughts. Participants reported their thoughts by answering the open-ended question, "What were you thinking about during this activity?" Space was provided for participants to write a short description of their thoughts.

Correspondence between thoughts and behaviors. Two independent raters coded the diary thought reports for whether participants were thinking about the behaviors in which they were engaged at each recording period. Thoughts were classified as corresponding with behavior when they involved the specific actions being performed (e.g., when cooking, thinking about "what else to put in the stew") or implicated abstract goals and outcomes that related in some way to the actions being performed (e.g., while making lunch, thinking "taking lunch [to work] will save

money this week"). Thus, we judged that participants' thoughts corresponded to their behavior when the thoughts either reflected specific, relatively low-level instrumental intentions or more abstract, higher level intentions. Thoughts and behaviors were classified as not corresponding when they were clearly about unrelated issues (e.g., when preparing food, thinking about "how much I do not like my job"). Because participants were allowed to report multiple simultaneous behaviors and multiple concurrent thoughts, correspondence was coded at the level of the individual behavior rather than at the level of the hourly entry. Raters agreed on 84% of behaviors, and the first author resolved disagreements.

Telephone survey. When contacted by phone, participants answered several questions regarding their lifestyles and daily activities at the time they completed the diary procedure. Specifically, participants reported (a) the number of hours per day they worked at a job, (b) the number of people with whom they lived, (c) the extent to which their daily activities were linked to important outcomes such as income or success, from 1 (*not at all*) to 5 (*extremely*), (d) the extent to which they "had to get things done everyday," from 1 (*not at all*) to 5 (*extremely*), and (e) the extent to which it mattered if they "put things off until tomorrow," from 1 (*not at all*) to 5 (*extremely*).[ii] Although we assessed various characteristics of participants' lifestyles and activities, data analyses focused primarily on the relatively objective measures involving hours worked at a job and household size.

Results and Discussion

The diary design yielded a non-independent, hierarchically nested data structure with behaviors grouped within individual participants. Thus, we treated participants as the unit of analysis and controlled for non-independence by aggregating measures at the level of participants or by using multilevel modeling (Kenny, Kashy, & Bolger, 1998; Raudenbush & Bryk, 2002).

Habit Performance

Direct effects of age. As shown in Table 1, 47% of the behaviors reported in participants' diaries (averaged at the level of participants) were classified as habits given that they were performed just about every day and usually in the same location. This estimate is similar to the proportions of college students' behaviors classified as habits in earlier research (*Ms* = 35% and 43%; Wood et al., 2002, Studies 1 and 2, respectively). Contrary to the hypothesis that older people perform more habits than younger people, habit performance was fairly constant across the range of ages represented in our sample. Specifically, a nonsignificant relationship emerged between participant age and the proportion of participants' reported behaviors that were classified as habitual, $r(98) = .09$, *ns*. In fact, separate analyses conducted on the frequency and context stability components of the habit measure revealed that older participants engaged in marginally *less* repetition of past behaviors than did younger participants. That is, mean ratings of past performance frequency (evaluated independently of context stability) were inversely correlated with age, $r(98) = -.19$, $p = .06$. Thus, older participants were marginally more likely to engage in novel behaviors, whereas younger participants tended to repeat familiar activities, although not always in the stable contexts that render well-rehearsed behaviors habitual.

The lack of a relationship between age and habit performance challenges the prediction that habit performance increases over the lifespan as a direct result of age-related cognitive and motivational changes. Of course, this lack of an effect does not challenge the vast literature on age-related impairments. Our sample contained few participants aged 60 or older (5% of our sample), the age group that is typically the focus of research on cognitive deficits among the elderly (e.g., Caldwell & Masson, 2001; Hay & Jacoby, 1999). Thus, the progression of age-related cognitive deficits was less advanced in our sample than would be expected among the very old. In addition, our diary methodology did not assess participants' proficiency at or time to complete the reported

activities—aspects of performance that may be especially sensitive to age-related declines in cognitive functioning.

We next considered the alternative hypothesis, that the combined effects of age and lifestyle determined habit frequency. First, we examined whether employment and household size varied with age, and then we evaluated whether these lifestyle factors influenced habit performance.

Age and employment. We conducted hierarchical polynomial regression analyses to examine whether age was significantly related to the number of hours per day that participants worked outside the home (see Cohen, Cohen, West, & Aiken, 2003). These analyses tested for linear and quadratic effects using participant age (grand mean centered) and the square of the centered age variable to predict hours worked per day, as reported by participants in the telephone survey. Results showed the relationship between age and hours worked to be curvilinear, B = -0.004, SE = 0.002, $t(80)$ = -2.40, $p < .05$ (quadratic component; see Table 2). Across the range of ages in our sample, the number of hours worked per day increased slightly through young adulthood, reaching its highest point at age 35.4 ($\hat{Y}$ = 5.97). After this maximum level, hours worked decreased at an accelerating rate. The same curvilinear pattern obtained when we examined only working participants and thus removed from the analysis participants who did not work outside the home, B = -0.01, SE = 0.002, $t(80)$ = -2.99, $p < .01$ (quadratic component). These findings of maximum working hours in middle age parallel the international data that we mentioned in the introduction to this article, in which middle-aged people were most likely to work full time (Delsen, 1998).

Separate analyses revealed that employment structured participants' lives in such a way as to foster habit performance. Regression analysis using hours worked per day to predict the proportion of participants' diary reports classified as habits showed that working longer hours was associated with greater habit performance, B = .02, SE = 0.01, $t(81)$ = 2.65, $p < .01$. The work-habit relationship also emerged when we reconfigured the employment variable and compared

participants who worked outside the home (n = 62) with those who were not employed or who worked in the home, for example, as a homemaker (n = 21). An analysis of variance design with employment status as a predictor of habit performance revealed that participants employed outside the home performed a greater proportion of habits (M = 52%) than did participants who were not employed (M = 34%), $F(1, 81) = 17.15$, $MSE = 0.03$, $p < .001$.

The relation between work and habit performance is likely to be functional given that habits are an efficient means of ensuring task completion. Work apparently conferred feelings of responsibility, as working participants, compared to those who were not employed, reported stronger feelings that their daily routines were linked to outcomes such as income and success, $r_{pb}(81) = .37$, $p < .001$, that they "had to get things done every day," $r_{pb}(81) = .27$, $p = .01$, and that it mattered if they "put things off until tomorrow," $r_{pb}(81) = .32$, $p < .01$. We speculate that habits are an efficient means to satisfy these perceived responsibilities.

In general, the findings for employment support the notion that age indirectly affects habit performance via age-related changes in lifestyle. Specifically, age had a curvilinear relationship with hours worked – work hours increased slightly until middle age before decreasing rapidly as people approached older adulthood. Before interpreting the overall relation between age and habit performance, we consider the effects of another habit-related lifestyle factor, household composition.

Age and household composition. We used a hierarchical polynomial regression model to determine whether household composition varied with age. Again, these analyses examined linear and quadratic relationships using participant age (grand mean centered) and the square of the centered age variable to predict the number of people with whom participants lived, as reported by participants in the telephone survey. The quadratic effect of age on household size, B = -0.003, SE = 0.0009, $t(80) = -3.24$, $p < .01$ (see Table 3), reflected an inverted-U shaped relationship, with the

youngest and oldest participants sharing their homes with few other people and middle-aged participants living with greater numbers of people (maximum at age 43.6, $\hat{Y} = 2.77$). This relation between age and household composition parallels that reported in research with national samples (e.g., Mirowsky & Ross, 1998).

As anticipated, an analysis in which the proportion of habits was regressed on household composition yielded a marginally significant effect, indicating that living with a greater number of people tended to decrease habit performance, $B = -.02$, $SE = 0.01$, $t(81) = -1.88$, $p = .06$. This finding is consistent with the notion that partners in close relationships form interconnected patterns of activities that can be interrupted by variations in any one individual's responses (Berscheid, 1983). Our participants who lived with others apparently were forced to respond flexibly in order to negotiate interruptions in established patterns, and could not simply repeat past acts.

The pattern of findings for household composition again suggested that age indirectly affects habit performance via age-related lifestyle characteristics. Age influenced household composition in a curvilinear fashion so that the greatest household size occurred in middle adulthood and smaller households were typical of young adults and older adults. In turn, household size affected habit performance, presumably due to housemates' interruptions of behavioral routines.

Combined effects of lifestyle and age. The combined effects of work and household members can explain the lack of a direct age-habit relationship. Both employment and household size were significantly linked to age. Employment increased slightly during young adulthood, peaked in the late 30s, and then dropped rapidly in later adulthood. Because middle-aged people worked longer hours than younger and older people, they were most strongly influenced by the stabilizing and habit-facilitating effects of employment. The relationship between age and household composition also was curvilinear, with people in their early 40s being more likely to live with others than were younger and older adults. Because of their tendency to live in larger

households than people in other stages of life, middle-aged adults apparently were most vulnerable to the habit-inhibiting effects of interdependence. In contrast, younger and older adults' lives were characterized by shorter work hours and less interdependence. Across all ages then, it seems that people faced lifestyle characteristics that both encouraged and discouraged habit performance. These conflicting influences apparently canceled each other, leading to a null relationship between age and habit performance.

Thought-Behavior Correspondence

Thought and habit performance. We conducted analyses on the correspondence between participants' thoughts in a given diary entry and the behaviors in which participants were engaged in the same entry – i.e., the extent to which participants were thinking about what they were doing. The HLM 5.05 statistical package (Bryk, Raudenbush, and Congdon, 2001) was used to conduct generalized non-linear multilevel models with the dichotomous dependent variable, thought-behavior correspondence (coded 0 when thoughts did not correspond with behavior and 1 when they did). A multilevel model using mode of behavior performance (habit versus nonhabit) to predict thought-behavior correspondence replicated the findings of Wood et al. (2002) in that participants were less likely to think about their actions during habits than nonhabits, $B = -0.63$, $SE = 0.10$, $t(98) = -6.32$¸ $p < .001$.

We also evaluated the effects of age on thought-behavior correspondence. When mode of performance (habit versus nonhabit) and participant age were entered simultaneously as predictors of thought-behavior correspondence, the relationship between mode of performance and thought remained unchanged, $B = -0.63$, $SE = 0.10$, $t(98) = -6.32$¸ $p < .001$, and the age effect was nonsignificant. Additional analyses of the interaction between mode of performance and age showed an almost uniform relationship between mode of performance and thought correspondence

among different age groups. Thus, we conclude that age does not moderate the effect of mode of performance on thought.

Thought and age. Given that habit performance predicts participants' behavior-relevant thought and that participants' age was not associated with habit performance, we expected similar levels of thought-behavior correspondence among participants of various ages. However, a multilevel model using only age (grand mean centered) to predict thought-behavior correspondence showed a significant age effect, $B = 0.01$, $SE = 0.005$, $t(98) = 2.79$¸ $p < .01$, such that older participants' thoughts corresponded to their actions more frequently than those of younger participants. We conducted additional analyses to try to explain the effects of age on thought about behavior.

Interestingly, exploratory analyses (using hierarchical linear and nonlinear models) revealed that participants' subjective ratings of the importance of their own behaviors increased with age, $B = 0.02$, $SE = 0.01$, $t(98) = 3.61$¸ $p < .01$, and that participants' ratings of importance completely mediated the age-thought correspondence relationship (see Baron & Kenny, 1986). That is, participant ratings of importance significantly predicted thought-behavior correspondence, $B = 0.25$, $SE = 0.03$, $t(99) = 7.32$¸ $p < .001$, and this effect remained unchanged when age was added as a simultaneous predictor of correspondence, $B = 0.25$, $SE = 0.03$, $t(98) = 7.31$¸ $p < .001$, whereas the age effect was reduced to nonsignificance, $B = 0.002$, $SE = 0.002$, $t(98) = 0.69$¸ *ns*. These findings suggest that older people thought more about their everyday actions because they perceived these to be relatively important. Such a pattern can be understood through Carstensen et al.'s (1999) socioemotional selectivity theory, in which people's perceptions of the future shape the meaning they attribute to their behavior. Older adults, whose limited sense of the future is likely to orient them to attain emotional satisfaction in the present, should be especially motivated to find meaning in their ongoing activities. We speculate that older people's search for meaning is evidenced in their

thought about everyday behaviors and their tendency to view such actions as important for attaining personal goals. Thus, although thought about habitual behavior is not necessary for successful performance (Wood et al., 2002), it may serve the purpose of enhancing emotional satisfaction.

Conclusion

People differ in how much their lives are structured by habits. Some people lead constant, stable lives and tend to repeat past behaviors in recurring contexts, whereas others follow more flexible daily patterns that are likely guided by intentions rather than habits (Ouellette & Wood, 1998). Although we did not find that older people performed more habits, age exerted an indirect effect on habits through its impact on people's lifestyles. Specifically, middle-aged people worked the longest hours and lived in the largest households, lifestyle factors that increased and decreased habits, respectively. The effects of these age-related circumstances on habits thus canceled each other, with the result that age was unrelated to habit performance.

As with habit performance, individual differences exist in the extent to which people think about their actions. Whereas some people's thoughts tend to consistently track their ongoing activities, others allow their thoughts to focus on behavior-irrelevant issues. Age appears to have a direct relation to thought patterns, as behavior-relevant thought increases through adulthood, presumably to satisfy older people's increased desire for contentment.

The descriptive approach taken in this research situates participants' thoughts and behaviors in the social contexts in which they occur. This is especially important for the study of habitual behavior because such acts are closely linked to features of the social context (e.g., location, salient social goals). Automatic performance of habits should not occur in the absence of these cues and, thus, it is difficult to examine the *actual performance* of people's everyday habits in a laboratory context (see Aarts & Dijksterhuis, 2000a, for an experimental investigation of reaction times for *choices* of habit-related stimuli). Lab studies in which participants are instructed to enact some habit

make the performance of that behavior more salient than it would be in everyday settings. In lab settings isolated from the social context in which habits develop, participants' performance of such frequently repeated past behaviors should be guided by conscious thoughts and intentions rather than habit. Experimental designs allow us to examine the development of certain habits under controlled conditions, but are less well suited for investigations of how everyday habits are performed and maintained in natural settings. Thus, the diary methodology offers an especially ecologically valid means of examining habits and a valuable compliment to laboratory research aimed at the study of habitual behavior.

The design of the present research also offers the advantage of sampling from many domains of behavior, life circumstances, and social roles. Certain regularities of habit performance appeared to exist across these varied situations. For example, habit performance required less behavior-relevant thought than nonhabit performance regardless of participant age in the present research and regardless of the complexity of the behavior in previous diary studies (Wood et al., 2002). The context-dependent nature of behavior and cognitive processes became apparent when participant characteristics were considered. Specifically, there were important individual differences in the prevalence of everyday habits (due to social roles) and thought correspondence (due to age) that could not have been detected in the typical college student samples common in psychological research (see Rozin, 2001; Sears, 1986). We believe that further descriptive work investigating people's behavior in everyday situations will yield additional insights into the context-dependent aspects of the operation of habits.

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Author Note

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Footnotes

[i] Five participants indicated that they made some diary reports retrospectively and noted which specific entries were retrospective (M = 10.7% of their reports). Retrospective reports were omitted from all analyses and the rest of these participants' data were retained.

[ii] Participants also responded to several additional questions involving daily activities (i.e., hours per day they performed schoolwork, hours per day they cared for children or dependent adults) and relationships with others (i.e., whether they were involved in a close relationship, the number of children at home, how much their daily activities depended on others, the amount of time they spent with others). We do not report findings from these because they did not reveal any interpretable effects.

Table 1

Means and Standard Deviations of Diary Variables

Variable	*M*	*SD*
Number of hourly diary entries per participant	24.72	4.39
Total number of behaviors reported by participant	33.43	9.39
Number of behaviors per diary entry	1.36	0.36
On the basis of experimenter's rating, the proportion of behaviors classified as:		
habitual (performed almost daily, usually in the same location)	.47	.18
corresponding with thoughts	.52	.15
Participants' ratings of:		
frequency of past behavior performance	2.41	0.26
stability of context	2.55	0.25
attention required	2.13	0.37
behavior difficulty	1.72	0.37
importance of behavior for personal goals	2.51	0.73

Note. Proportions were computed for each participant and the mean value that is reported in the table was calculated across participants. Participants rated past performance frequency and contextual stability on 3-point scales, attention on a 4-point scale, and difficulty and importance on 5-point scales. In all cases, higher scale numbers indicated greater levels of the variables assessed.

Table 2

Hierarchical Polynomial Regression Analysis Summary for Participant Age Predicting Hours Worked Per Day

Variable	*B*	*SE B*	β	ΔR^2
Age, Linear component	-0.050	.027	-0.20	.04*
Age, Quadratic component	-0.004	.002	-0.31	.07**

*$p < .10$. **$p < .05$.

Table 3

Hierarchical Polynomial Regression Analysis Summary for Participant Age Predicting Number of Other People in Participants' Households

Variable	*B*	*SE B*	*β*	ΔR^2
Age, Linear component	0.008	.0154	0.06	.004
Age, Quadratic component	-0.003	.0008	-0.42	.115*

*$p < .01$.