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Early Birds and Night Owls: Differences in Media Preferences, Usages, and Environments

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Morningness-eveningness is an individual difference that explains variations in rhythmic expression of biological and behavioral patterns. Based on an online survey of 1,210 Internet users, this study explores differences between day and night persons in their media preferences, uses, and environments. Findings indicate that morning persons are inclined toward using traditional media in traditional environments, whereas night persons reported significantly higher preference for and use of new media in more varied locations. Results remained significant after controlling for sociodemographics. The findings suggest that night persons, previously described as "socially jet-lagged," are also "technologically jet-lagged" individuals who tend to be ahead of others in terms of new technologies. This technological jet lag may represent a coping strategy that promotes adjustment to societal clocks.

Keywords: audience research, chronotype, media habits, morningness, social cognitive theory

Introduction

Science has long documented individual differences in circadian rhythms and preferences associated with morning or evening activities. Although morningness-eveningness literature suggests that these differences may be described as a continuum (Natale & Cicogna, 2002), they are often viewed dichotomously, underscoring the contrast between *morning persons* and *night persons* (Randler, 2008a). Morning persons, commonly referred to as "larks" or "early birds," tend to go to sleep and get up early and perform mentally and physically best in the morning hours. The night persons, or "owls," prefer to go to bed and wake up at a later time and best perform, both mentally and physically, in the late afternoon or evening.

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Hundreds of studies conducted over the past decades have explored various aspects of this diurnal dichotomy. However, references to it in communication research are rather scarce. Adopting social cognitive theory (Bandura, 2001), which claims that every human behavior may be better understood once the "person," the "behavior," and the "environment" are examined, this study seeks to explore differences in media preferences (person), use (behavior), and place (environment) of day and night persons, respectively.

Literature Review

Morningness-eveningness (also known as circadian typology or chronotype) is an individual difference that explains variations in the rhythmic expression of biological and behavioral patterns. It is associated with many circadian rhythms—common biological variables such as body temperature, heart rate, blood pressure, and hormone levels that display a definite periodicity with a cycle length of 24 hours (Adan et al., 2012). There is considerable evidence demonstrating that individual differences are genetic (Klei et al., 2005; Vink, Vink, Groot, Kerkhof, & Boomsma, 2001). Nevertheless, genetic variability accounts for less than half the total variance, and morningness-eveningness may be affected by many environmental, social, and personal factors.

Environmental factors documented in the literature include climate zone, longitude, and latitude, with more morning orientation in Central Europe toward both the East and North as well as more night orientation in subtropical climates (Randler, 2008b). Furthermore, people born in autumn and winter tend to be morning persons, whereas those born in spring and summer are more likely to be night owls (Chotai, 2005; Natale & Adan, 1999; Natale, Adan, & Chotai, 2002). Such findings demonstrate the significance of sunlight exposure to morningness.

Social factors consist of cultural norms and traditions such as the siesta in Spain (Randler & Díaz-Morales, 2007) as well as normative social schedules such as work and school hours (Wittmann, Dinich, Merrow, & Roenneberg, 2006). Studies have demonstrated, for example, that young workers tend to be more morning oriented than students of the same age. Thus, entering the work force appears to promote a change in diurnal rhythms (Mecacci & Zani, 1983; Park, Matzumoto, Seo, Shinkoda, & Park, 1997). Moreover, morningness was found to be associated with greater lifestyle regularity (Monk, Buysse, Potts, DeGrazia, & Kupfer, 2004).

Personal factors include gender, with most evidence demonstrating that females are significantly more morning oriented than males (for review, see Randler, 2007), as well as age. Teenagers tend to shift toward eveningness (Kim, Dueker, Hasher, & Goldstein, 2002), regressing at the end of puberty (Roenneberg et al., 2004). As adults age, they become more inclined toward morningness (Klei et al., 2005; Paine, Gander & Travier, 2006), a phenomenon attributed to the physical changes associated with aging processes, such as changes in circadian melatonin and temperature rhythms (Duffy, Dijk, Hall, & Czeisler, 1999).

Psychological studies have examined the association between morningness-eveningness and *cognition*, *personality*, and *mental health*. Although night persons were found to be more likely to have

higher intelligence scores (Roberts & Kyllonen, 1999), morning-oriented students tended to exhibit better academic achievement (Beşoluk, Önder, & Deveci, 2011; Randler & Frech, 2006). This contradiction may be clarified by social schedules (Wittmann et al., 2006), because school and examination times are typically during morning hours.

Night persons were found to be more extroverted (Neubauer, 1992; Wilson, 1990), impulsive (Caci, Robert, & Boyer, 2004, Neubauer, 1992), novelty seeking (Caci et al., 2004; Chotai, 2005), sensation seeking (Tonetti et al., 2010), and risk taking (Killgore, 2007) than others, and morning persons were more conscientious and agreeable (Randler, 2008c) and more activity-oriented (Muro, Gomà-i-Freixanet, & Adan, 2009). Morningness was also associated with greater acceptance of social values (conservation and self-transcendence), whereas eveningness was correlated with preference for individual values, such as openness to change, and self-enhancement (Vollmer & Randler, 2012).

Furthermore, morning persons were found to be more emotionally stable (Muro et al., 2009), whereas eveningness was associated with more frequent and intense reported psychological and psychosomatic disorders (Mecacci & Rocchetti, 1998), lower levels of life satisfaction (Randler, 2008a), and higher levels of depression (Hasler, Allen, Sbarra, Bootzin, & Bernert, 2010; Konttinen et al., 2014; Randler, 2011), anxiety (Díaz-Morales & Sánchez-López, 2008; Lemoine, Zawieja, & Ohayon, 2013), addiction disorders, and personality disorders (Lemoine et al., 2013). Eveningness was also associated with health-impairing behaviors such as substance abuse (Gau et al., 2007; Urbán, Magyaródi, & Rigó, 2011), physical inactivity (Randler, 2011; Urbán et al., 2011), and emotional eating (Konttinen et al., 2014).

The few studies that have assessed morningness-eveningness in terms of media use have revealed that eveningness was associated with spending more time in front of screens, including computers, television sets, and video game consoles (Kauderer & Randler, 2013; Shochat, Flint-Bretler, & Tzischnsky, 2010; Urbán et al., 2011; Vollmer, Michel, & Randler, 2012). Other studies have found that eveningness was also associated with more problematic media use, including increased computer and mobile phone use in bed before going to sleep (Fossum, Nordnes, Storemark, Bjorvatn, & Pallesen, 2014), compulsive Internet use (Lin & Gau, 2013; Randler, Horzum, & Vollmer, 2013), and computer game addiction (Vollmer, Randler, Horzum, & Ayas, 2014). Similarly, studies have shown correlations between evening use of television, computer games, and the Internet to delayed bedtimes (Brunborg et al., 2011; Cain & Gradisar, 2010; Custers & Van den Bulck, 2012).

Overall, previous studies have suggested an association between eveningness and more (problematic) media use. However, as noted by Fossum and colleagues (2014), these studies had several significant weaknesses. First, they focused primarily on students and adolescents, who tend to shift toward eveningness and have schedules different from those of adults (Kim et al., 2002; Roenneberg et al., 2004). Second, they tended to examine electronic media only and typically were limited to one or two electronic devices. Third, most studies examined frequency of use rather than duration and thus were limited in their ability to describe use patterns. Finally, most previous research overlooked location entirely, except when addressing media use in bed.

The present study seeks to expand understanding of the association between morningness-eveningness and media use by investigating users of all ages, examining a wide range of media (including traditional and new media), measuring duration rather than frequency of use, and relating to location of use. Specifically, it explores whether people who define themselves as morning persons differ from self-defined night persons in their media preferences, usage, and place of use. Adoption of the social cognitive theory (Bandura, 2001) approach by relating to person (preferences), behavior (media usages), and environment (places of use) improve comprehension of this human phenomenon and its implications in audience research.

Method

Data Collection and Sample

The study was based on a national online survey of 1,210 Israeli Internet users that was part of a large cross-European audience research project. Data were collected by a commercial firm. Participants were randomly recruited from a panel of 60,000 Internet users ages 14 and older. Gender, age, income, and residential area quotas were instituted to ensure that the sample is representative of the country's population. Once each quota was full, the survey was automatically closed to additional participants from the defined population group. Respondents were 14 to 75 years old, and the mean age was 38.3 years (*SD* = 15.79). Fifty-one percent were female, 52.5% were married and had children, and 28.9% were single. Sixty-seven percent of the respondents had some postsecondary education, 32.4% reported having income higher than average, and 31.5% reported income lower than average. Fifty-two percent worked full time, 14% worked part time, 18.9% were students, and 6% were retired.

Data collection was facilitated by SurveyGizmo software. Groups of questions referring to specific subjects were presented on separate pages, and respondents could not proceed to the next page without answering all the questions on the previous one. This method guaranteed very few incidents of missing data. It should be noted, however, that certain questions included "do not remember" and/or "prefer not to respond" options. Furthermore, respondents aged 14 to 18 years old were not presented with questions regarding employment status, income, and family status. Because participation was anonymous, the study was exempted from human subject review.

Measurement

The questionnaire was based on a study by Jensen and Helles (2011) and was further developed by all partners of the cross-European audience research project. It included closed-ended questions that explored the following areas:

Media preferences. Respondents were presented with five hypothetical daily situations representing various needs: urgent and nonurgent information, urgent and nonurgent personal communication, and leisure. For each situation, they were given a list of media alternatives and were asked to mark the three they were most likely to use. The number of alternatives ranged from 7 to 14, depending on the situation. Sample situations include: "Imagine that you are going to contact an old

acquaintance that you have lost touch with" (nonurgent personal communication) and "Imagine you have a few hours of free time to yourself" (leisure).

Media use the day before responding to the survey. Respondents were asked to think about the previous day and report how much time they spent using various media. This part of the questionnaire was split into two phases. The first related to traditional mass media (e.g., television, radio, newspapers) and differentiated between old media and digital/Internet-based use (via computer and cellular phone), and the second considered various Internet-based activities, such as use of social network services (SNSs), blogging, and playing online games. Respondents were also asked to report the number of mobile phone conversations they had had and the number of text, image, and sound messages they had sent the previous day. In addition, they were presented with a list of 19 mobile phone functions and were asked to report which functions they used.

Places of media use. For television, radio, newspaper, and Internet use, respondents were presented with a list of three at-home (e.g., in the living room) and five out-of-home locations (e.g., at work, at school, public spaces) and were asked to mark all locations that applied to their own use of each medium.

Background questionnaire. The questionnaire included 10 demographic and sociodemographic questions. The variables examined were: sex, age, family status, education, income, employment status, type of occupation, residential area, satisfaction with health, and satisfaction with life (the last two on a scale ranging from 1 to 10, with higher scores representing more satisfaction).

Self-defined morningness. The last page of the Israeli survey provided respondents with a short description of day-night orientation. It explained that all persons have specific times during the day when they are most energetic and efficient, and that whereas the "morning persons are at their best in the morning, night persons are at their peak in the afternoon and can commonly function well until late at night." Respondents were asked to indicate which category better described them. In line with the common perception of morningness as a dichotomy (Randler, 2008a), respondents were provided with only two alternatives.

Data Analysis

Data were analyzed using SPSS v.20 software. Sample participants were split into two groups based on the self-defined morningness question. To identify significant differences between groups with regard to media preferences, use, places, and background characteristics, cross-tabulations, χ^2 tests, and *t* tests were employed. In multiple-choice questions, χ^2 tests were conducted per item. Because differences in media use could be affected by various background factors, a series of regressions (five logistic regressions and one linear regression) was conducted. Dependent variables were media usages that were found to be significantly different among morning and night persons. Independent variables were sociodemographic factors that were found to be significantly different for morning and night persons as well as the day-night orientation.

Results

Differences Between Morning and Night Persons in Media Preferences

Overall, 67.2% of the people in the sample (n = 813) defined themselves as morning persons, and 32.8% (n = 397) as night persons. Examination of respondents' preferred media in various hypothetical situations demonstrated that the three top-rated media for each function were identical among morning and night persons. However, a series of cross-tabulations and χ^2 tests identified many significant differences between the groups regarding the percentage of individuals indicating each medium as a preferred option. These findings suggest a greater preference for new media among night persons and more fondness for traditional media among morning persons (see Table 1).

Table 1. Differences Between Morning and Night Persons in Media Preferences.

Function	Preferred medium	Percentage of participants who prefer the medium		
		Self-definition		The sample (N = 1,210)
		Morning persons (n = 813)	Night persons (n = 397)	
Information—urgent	Websites	86.0	87.2	86.4
	Television/radio	54.4	53.7	54.1
	Telephone*	50.4	44.3	48.4
Information—nonurgent	Search engines	85.1	86.9	85.7
	Specific websites*	64.8	70.3	66.6
	Telephone*	48.5	41.6	46.2
Personal communication—urgent	Telephone*	87.6	83.1	86.1
	E-mail**	63.6	54.9	60.7
	SNSs***	45.5	56.9	49.3
Personal communication—nonurgent	Telephone	88.2	85.1	87.2
	Text message	70.2	72.3	70.9
	SNSs**	59.9	69.5	63.1
Leisure	Television	51.5	49.9	51.0
	Telephone*	42.3	35.8	40.2
	SNSs***	31.1	45.1	35.7

Note. For each function, respondents were provided with a detailed example and were asked to mark the three media they were most likely to choose. Only the three top-rated media for each function are reported here.

*** $p < 0.001$. ** $p < 0.01$. * $p < 0.05$.

Considerably more people among the morning persons chose telephone calls for information needs, both urgent (50.4% vs. 44.3% among the night persons, $p = .046$) and nonurgent (48.5% vs. 41.6%, $p = .024$), for urgent personal communication (87.6% vs. 83.1%, $p = .035$), and for leisure (42.3% vs. 35.8%, $p = .029$). Morning persons also tended to choose e-mail for urgent personal communication (63.6% vs. 54.9%, $p = .004$). Significantly more people among the night persons chose SNSs for personal communication needs, both urgent (56.9% vs. 45.5% among morning persons, $p < .001$) and nonurgent (69.5% vs. 59.9%, $p = .001$) and for leisure (45.1% vs. 31.1%, $p < .001$). In addition, the night persons tended to choose specific websites for nonurgent information needs (70.3% vs. 64.8%, $p = .049$).

Differences Between Morning and Night Persons in Media Use

Differences in media preferences were manifested in respondents' reported media use the day before they took the survey. Analysis identified several differences between morning and night persons with regard to mass media use (see Table 2). A far higher percentage of morning persons reported watching television on a television set (82.7% vs. 72.3% among the night persons, $p < .001$), listening to the radio on a radio set (63.5% vs. 51.9%, $p < .001$), and reading print newspapers (61.7% vs. 50.6%, $p < .001$). Furthermore, there was a significant difference among the individuals who reported reading online newspapers during the day before the survey $t(868) = 2.295$, $p = .022$. On average, morning persons spent more time doing so ($M = 40.17$ minutes, $SD = 51.50$) than the night persons ($M = 32.64$ minutes, $SD = 31.93$).

A comparison between the groups with regard to online activities (see Table 3) identified two more significant differences between the groups. In this case, the night persons had considerably higher percentages of respondents reporting that the day before the survey they used SNSs (82.7% vs. 72.3% among the morning persons, $p = .006$) or posted entries at chat sites, blogs, and so on (63.5% vs. 51.9%, $p = .014$). No significant differences were found with regard to the time spent on various online activities on the day before the survey.

Despite the morning persons' higher reported preference for telephones, no significant differences were found between the groups with regard to the number of mobile phone conversations they had ($t(893) = 1.319$, $p = .188$) and the number of text, image, and sound messages they sent ($t(810) = -0.321$, $p = .748$) the previous day. By contrast, responses to the question examining use of various mobile phone applications indicated that night persons had significantly higher rates of individuals who reported use of four such applications: watching television or videos (44.9% vs. 37.1%, $p = .014$), listening to music (54.5% vs. 45.1%, $p = .003$), recording video (61.9% vs. 55.7%. $p = .049$), and using alarm clocks and reminders (90.1% vs. 84.6%, $p = .012$).

Table 2. Differences Between Morning and Night Persons in Mass Media Use.

Medium	Percentage of participants who reported using the medium yesterday			Average reported use time (in minutes)				
	Self-definition			Self-definition				
	Morning persons	Night persons	*p*	Morning persons	Night persons	*t*	*df*	*p*
TV on a TV set	82.7	72.3	.000***	112.22 (71.60)	120.61 (97.91)	−1.461	931	.144
TV on a computer	40.7	43.8	.302	87.62 (134.06)	87.32 (193.06)	0.025	473	.980
TV on a mobile	19.4	21.2	.481	39.46 (112.59)	37.93 (69.10)	0.106	212	.916
Radio on a radio set	63.5	51.9	.000***	92.94 (190.57)	95.98 (315.78)	−0.188	674	.851
Radio on a computer	30.1	26.7	.216	116.33 (156.27)	95.05 (144.70)	1.131	315	.259
Radio on mobile	20.0	20.4	.885	33.16 (49.96)	41.94 (79.95)	−0.975	210	.331
Print newspapers	61.7	50.6	.000***	32.47 (26.3)	33.82 (55.76)	−0.422	660	.673
Online newspapers	74.8	77.6	.287	40.17 (51.50)	32.64 (31.93)	2.295	868	.022*
Print books	44.3	43.6	.817	49.42 (62.31)	51.27 (49.95)	−0.325	478	.745
Electronic books	14.8	13.4	.511	30.22 (70.93)	33.88 (50.77)	−0.303	139	.762
Audio books	9.6	8.6	.562	6.25 (18.50)	5.48 (13.51)	0.188	83	.851
Audio players	56.5	59.1	.514	80.29 (102.83)	63.31 (71.85)	1.640	359	.102
Video players	46.5	45.6	.842	71.97 (50.20)	67.19 (48.10)	.689	242	.491

Note. Numbers in parentheses represent standard deviations.
*** $p < 0.001$. ** $p < 0.01$. * $p < 0.05$.

Table 3. Differences Between Morning and Night Persons in Online Activities.

Online activity	Percentage of participants who reported involvement in the previous day			Average reported use time (in minutes)				
	Self-definition			Self-definition				
	Morning persons	Night persons	*p*	Morning persons	Night persons	*t*	*df*	*p*
Getting news	81.9	81.4	.813	31.60 (38.61)	29.03 (24.40)	1.046	900	.296
E-mails	90.0	90.9	.621	52.82 (78.29)	47.36 74.65)	1.063	1,015	.288
Downloading content	20.0	22.7	.293	34.42 (74.54)	25.86 (31.11)	0.951	198	.343
Computer games	25.7	29.7	.140	51.14 (68.18)	53.50 (74.17)	–0.267	271	.790
Social network sites	69.2	76.8	.006**	60.48 (104.27)	74.96 (113.33)	–1.805	788	.071
Chat programs	29.3	28.5	.770	36.72 (97.91)	44.11 (78.25)	–0.632	285	.528
Reading entries	36.0	39.3	.271	34.38 (62.96)	41.52 (91.80)	–0.898	384	.370
Posting entries	15.0	20.7	.014*	31.07 (74.75)	34.00 (110.52)	–0.198	154	.844
Online shopping	35.2	34.3	.752	16.23 (14.35)	16.23 (13.93)	0.000	373	1.000
Websites of interests or hobbies	58.9	62.2	.271	44.71 (84.28)	50.54 (87.74)	–0.812	628	.417

Note. Numbers in parentheses represent standard deviations.

*** $p < 0.001$. ** $p < 0.01$. * $p < 0.05$.

Differences Between Morning and Night Persons in Places of Media Use

Differences between morning and night persons were found not only with regard to the types of media they tended to use but also the places they did so (see Table 4). A series of cross-tabulations and χ^2 tests identified some significant differences ($p < .005$) with regard to mass media use. The night persons had higher rates of respondents who reported reading printed newspapers at school or other places of study (17.6% vs. 12.8% among the morning persons, $p = .024$) or while traveling (41.3% vs. 35.3%, $p = .042$). They also had higher rates of respondents who reported watching television in public spaces (10.8% vs. 5.4%, $p = .001$), whereas morning persons had higher rates of respondents who reported listening to the radio while traveling (68.6% vs. 62.2%, $p = .026$).

The number of differences and their significance were greater with regard to Internet use: Night persons had higher rates of respondents who reported using the Internet in five locations, including the bedroom (54.9% vs. 42.3% among the morning persons, $p < .001$), at the homes of friends and family (42.6% vs. 33.1%, $p = .001$), at school or other places of study (33.8% vs. 20.8%, $p < .001$), while traveling (43.1% vs. 34.8%, $p = .005$), and in public spaces (42.1% vs. 30.8%, $p < .001$). Thus, it may be argued that night persons are significantly more "switched on" than morning persons.

Differences Between Morning and Night Persons in Background Characteristics

Because differences in media use could be affected by various sociodemographic factors, it was necessary to examine the differences between the background characteristics of morning and night persons and then control for differentiating factors. Analysis identified significant differences between morning and night persons in family status, employment status, income level, age, and satisfaction with life (see Table 5). With regard to family status, there were considerably more married individuals with children among the morning persons and considerably more single individuals with no children among the night persons ($\chi^2(7, N = 1{,}111) = 38.85$, $p = .000$). Similarly, there were considerably more individuals who worked full time among the morning persons and considerably more students among the night persons ($\chi^2(7, N = 1{,}111) = 36.43$, $p = .000$).

Analysis also displayed significant differences between morning and night persons with regard to monthly personal income level ($\chi^2(7, N = 1{,}111) = 29.01$, $p = .000$). A much higher percentage of night persons reported incomes far below average or preferred not to respond to the income question. There was also a significant effect for age ($t(1{,}208) = 4.349$, $p = .001$): The reported age of morning persons was significantly older than that of night persons ($M = 39.63$ vs. 35.46). Moreover, morning persons reported higher satisfaction with life ($t(1{,}208) = 2.790$, $p = .005$) than night persons ($M = 7.62$ vs. 7.32). Morning and night persons did not differ with regard to gender ($\chi^2(1, N = 1{,}210) = 0.65$, $p = .422$), level of education ($\chi^2(7, N = 1{,}210) = 9.30$, $p = .232$), type of occupation ($\chi^2(10, N = 1{,}210) = 12.16$, $p = .274$), type of residential area ($\chi^2(5, N = 1{,}210) = 1.46$, $p = .918$), or satisfaction with health ($t(1{,}208) = 0.975$, $p = .330$).

Table 4. Differences Between Morning and Night Persons in Places of Media Use.

	Self-definition		
	Night persons (n = 397)	Morning persons (n = 813)	The sample (N = 1,210)
Newspapers			
At home—living room	70.8	68.3	70.0
At home—bedroom	38.1	39.5	38.6
At home—other	27.7	27.0	27.4
At friends or family	21.6	25.9	23.1
At work	27.8	27.2	27.6
At school or other place of study*	12.8	17.6	14.4
While traveling*	35.3	41.3	37.3
In public spaces (e.g., cafes)	29.5	33.0	30.7
Radio			
At home—living room	40.0	35.8	38.6
At home—bedroom	22.4	21.7	22.1
At home—other	17.7	17.4	17.6
At friends or family	6.5	6.3	6.4
At work	25.6	23.2	24.8
At school or other place of study	2.7	2.0	2.5
While traveling*	68.6	62.2	66.5
In public spaces (e.g., cafes)	3.3	2.5	3.1
Television			
At home—living room	82.8	79.1	81.6
At home—bedroom	50.2	51.4	50.6
At home—other	19.1	19.1	19.1
At friends or family	34.8	39.0	36.2
At work	5.5	4.3	5.1
At school or other place of study	2.1	2.5	2.2
While traveling	3.0	4.8	3.6
In public spaces (e.g., cafes)**	5.4	10.8	7.2
Internet			
At home—living room	61.6	65.0	62.7
At home—bedroom***	42.3	54.9	46.4
At home—other	58.5	59.7	58.9
At friends or family**	33.1	42.6	36.2
At work	62.0	62.2	62.1
At school or other place of study***	20.8	33.8	25.0
While traveling**	34.8	43.1	37.5
In public spaces (e.g., cafes)***	30.8	42.1	34.5

Note. Numbers represent percentages. *** $p < 0.001$. ** $p < 0.01$. * $p < 0.05$.

Table 5. Differences Between Morning and Night Persons in Background Characteristics.

	Self-definition		The sample
	Morning persons	Night persons	
Family status (%)			
Single, no children	24.0	38.9	28.9
Single, with children	1.6	1.6	1.6
Married, no children	7.6	8.2	7.8
Married, with children	58.6	40.0	52.5
Divorced, no children	1.1	1.1	1.1
Divorced, with children	5.9	8.2	6.7
Widowed, no children	0.1	0.0	0.1
Widowed, with children	1.1	1.9	1.4
N	(746)	(365)	(1,111)
Employment status (%)			
Full time	56.3	44.7	52.5
Part time	13.8	14.5	14.0
Unemployed	1.9	5.8	5.8
Retired	9.4	6.0	6.0
Student	11.3	18.9	18.9
Unpaid position	3.1	2.7	2.7
Other	2.9	4.9	4.9
Do not know	1.3	2.5	2.5
N	(746)	(365)	(1,111)
Monthly personal income (%)			
A lot above average	9.7	6.8	8.7
Slightly above average	25.3	20.3	23.7
Similar to the average	18.6	14.5	17.3
Slightly below average	13.1	10.1	12.2
A lot below average	17.2	23.6	19.3
Do not know	0.3	1.9	0.8
Prefer not to respond	15.8	22.7	18.1
N	(746)	(365)	(1,111)
Age $t(1,208) = 4.349$, $p = .001$			
Mean age	39.63	35.46	38.3
SD	(16.00)	(14.97)	(15.79)
N	(813)	(397)	(1,210)
Satisfaction with life $t(1,208) = 2.790$, $p = .005$			
Mean satisfaction with life	7.62	7.32	7.52
SD	(1.65)	(1.96)	1.76
N	(813)	(397)	(1,210)

Note. Statistics were significant at $p < 0.05$ for the cross-tabulations and *t* tests presented.

Factors Explaining Differences in Media Use

All five differentiating background characteristics, as well as morning-night orientation, were used as independent variables in a series of regressions. The dependent variables were the use of media the day before the survey that were found to be significantly different for the two groups. Six regressions were conducted: five logistic regressions, with the dependent variable as dummy (use/nonuse), and one linear regression, in which the time spent reading online newspapers was the dependent variable. A summary of the analyses is provided in Table 6.

Some of the differentiating background characteristics, especially age and employment status, were indeed significantly associated with the various media uses, but after controlling for these characteristics, morning-night orientation was still significantly associated with media use. Being a night person was negatively associated with watching television on a television set (B = −.555, p = .003), listening to the radio on a radio receiver (B = −.319, p = .044), reading print newspapers (B = −.388, p = .012), and time spent reading online newspapers (β = −.069, p = .019); it was positively associated with using SNSs (B = .351, p = .001) and posting to chat sites, blogs, and so on (B = .489, p = .010).

Table 6. Summary of Regression Analyses That Examined the Associations Between Morningness and Media Use After Controlling for Different Sociodemographics.

	TV use (y/n)	Radio use (y/n)	Print newspapers (y/n)	Online newspapers (Time)	SNS use (y/n)	Posting entries (y/n)
Predictor	*B*	*B*	*B*	β	*B*	*B*
Day-night orientation	−.555**	−.319*	−.388*	−.069*	.351**	.489*
Family status	−.431	−.138	.157	−.034	−.530**	−.015
Employment status	882***	.508**	.073	.017	−.159	.045
Income	.218	.388	.013	.034	.255	−.166
Age	050***	.041***	.036***	−.054	−.024***	.001
Life satisfaction	−.069	.024	.030	.036	.012	−.037
Constant	−.075	−1.590	−1.336		2.040	−1.479
χ^2	103.76	108.75	80.37		52.08	8.86
df	6	6	6		6	6

Note. Dependent variables were media usages that were found to be significantly different for morning and night persons (Tables 2 and 3). Independent variables were sociodemographics that were found to be significantly different for morning and night persons (Table 5). The regression for time spent reading online newspapers was linear regression (R^2 = .010, F = 2.064). All other regressions were logistic regressions with the dependent variable coded as 1 = reported using the medium in the previous day or 0 = reported nonuse. Other dummy codes were day-night orientation: 1 = night, 0 = morning; family status: 1 = married with children, 0 = other; employment status: 1 = full time, 0 = other; income: 1 = higher than average, 0 = similar to average or below. N = 901 because only people who reported their income were included in the analyses.

*** $p < 0.001$. ** $p < 0.01$. * $p < 0.05$.

Discussion

Whereas early communication theories assumed that media consumption is an outcome of conscious selection (Ouellette & Wood, 1998; Palmgreen, Wenner, & Rosengren, 1985), a growing body of knowledge suggests that many media behaviors are automatic and nonconscious. Such so-called media habits are often activated by internal (e.g., moods, goals, related thoughts) and external (e.g., time, location, partners, preceding events) cues, acting alone or together with conscious intentions framed by expected outcomes to determine behavior (LaRose, 2010). Morningness-eveningness may act as both internal and external cue affecting media habits, because it is an individual difference that is time-sensitive. Hence, understanding its association with media use may shed some light on how media habits are formed and provide potential explanations for their roles.

The method applied in the present study overcame many of the drawbacks characterizing the few previous studies examining morningness-eveningness with regard to media use (Fossum et al., 2014). Because this study assessed individuals at all ages rather than just teenagers or students, examined a wide range of media instead of only one or two, and measured duration rather than just frequency of media use, it provided a much broader scope and greater accuracy than did previous studies. Furthermore, whereas previous studies chiefly explored behavior (media uses), the current study applied the multidimensionality of social cognitive theory (Bandura, 2001) and related to the person (preferences) and the environment (places of use) as well, enabling a deeper understanding of the various aspects associated with media use among individuals with different morning-evening orientation.

Overall, the findings displayed considerable differences between self-defined morning and night persons with regard to media preferences, uses, and places of use. Morning persons demonstrated preference for traditional media (e.g., telephone) in various hypothetical situations and reported more use of traditional mass media (television, radio, and newspapers) the day before they took the survey. They also tended to use these media in a traditional manner (e.g., watching TV on a television set) rather than opting for their online equivalents, and they were more inclined to use the various media in traditional places, primarily at home. Night persons reported a significantly higher preference for new media (e.g., SNSs), which was reflected in their reported media use the day before the survey as well as in their greater tendency to use the Internet in various out-of-home locations.

Findings indicated high congruence among each group's preferences, uses, and places of media use. Furthermore, these preferences largely confirmed the results of previous research, demonstrating that night owls are more intensive users of new media (Kauderer & Randler, 2013; Shochat et al., 2010; Urbán et al., 2011; Vollmer et al., 2012). The study also referred to use of traditional media, however, and found only tiny differences in overall duration of use, suggesting that the night persons are not more intense users of media in general. They simply prefer media that are *different* from those commonly used by the morning persons.

This finding somewhat dispels the myth that eveningness is associated with problematic media use, which was supported by studies on young audiences' use of the Internet (e.g., Lin & Gau, 2013; Randler et al., 2013). Because teenagers and students are typically inclined toward eveningness and have

irregular daily schedules (Kim et al., 2002; Roenneberg et al., 2004), and because they represent a new media generation, one that was born into the cybernetic revolution (cf. Lenhart, Purcell, Smith, & Zickuhr, 2010), they exhibit both high levels of eveningness and high frequency of problematic new media use. Causal relations between these variables, however, are yet to be investigated (Fossum et al., 2014).

The literature regarding the association between morningness-eveningness and psychological traits may explain some of the findings of the present study. Night persons were more likely to have higher intelligence scores (Roberts & Kyllonen, 1999) and novelty-seeking personalities (Caci et al., 2004; Chotai, 2005), possibly explaining their preference for new technologies and more intense use thereof. Furthermore, the correlation of eveningness with extroversion (Neubauer, 1992; Wilson, 1990) and with preference for individual values and self-enhancement (Vollmer & Randler, 2012) may illuminate owls' preference for many-to-many media that enable self-expression (SNSs, chat sites, blogs, etc.) over the traditional one-to-many media. The morning persons' greater conscientiousness and acceptance of social values (Randler, 2008c; Vollmer & Randler, 2012) hints at their higher use of traditional media in general and of newspapers (both electronic and print) in particular.

Wittmann and colleagues (2006) argued that, because night persons suffer from continuous conflict between biological and societal clocks, they should be regarded as "socially jet-lagged." The findings of the current study suggest that they are also "technologically jet-lagged." Although they are continuously behind the normative time according to societal clocks, they tend to be ahead of others in terms of technological clocks. The constraints of early work and study schedules lead the night persons to accumulate an increasing sleep debt and to require efficient time management. The use of advanced technologies may promote effective use of time because they can accelerate processes such as information search and social interaction. Thus, it is possible that the night persons' technological jet lag and media habits represent a *coping strategy* that facilitates their adjustment to societal clocks.

This new theoretical proposition should be explored further in future research, but the current study already exhibits several theoretical and methodological implications. First, by relating to a wide range of media, it demonstrates a replacement pattern among night persons. Results showed that night persons do not use media more intensively than morning persons, but rather use more new media and less traditional mass media. According to the social cognitive theory (Bandura, 2001), human behavior is self-regulated, and self-regulation mechanisms are considered key factor in shaping media habits (LaRose, 2010). Therefore, the media replacement patterns among the owls may be considered a self-regulation process, and morningness-eveningness should be regarded as an individual difference affecting media habits.

Second, the findings suggest that morning-night orientation is a significant predictor of media use. Hence, audience researchers may benefit from including this ordinarily neglected element in their studies. Moreover, because night persons appear to be ahead of others in terms of advanced technology adoption, examining their media use may help predict the relevant trends. Finally, although the study used self-definition rather than one of the existing long morningness-eveningness scales (Adan et al., 2012; Thun et al., 2012), differences between morning and night persons did resemble those indicated in previous research, including background characteristics such as age (Klei et al., 2005; Paine et al., 2006)

and work status (Mecacci & Zani, 1983; Park et al., 1997), life satisfaction (Randler, 2008a), and patterns of media use such as Internet use in the bedroom (Fossum et al., 2014). This congruence suggests that in cases of restricted questionnaires, the one-item measure may well serve as a sound indicator of morningness-eveningness.

Limitations and Future Research

Notwithstanding the strengths of this study, it also has several limitations that should be acknowledged. First, this study examined self-defined morningness rather than testing individual differences based on existing scales (Adan et al., 2012; Thun et al., 2012). This one-item self-assessment measure is inevitably less reliable than the multi-items tests (Di Milia, Adan, Natale, & Randler, 2013), and thus it is possible that using it concealed some significant insights. Moreover, because morningness-eveningness was perceived as a polar rather than continuous pair of descriptors (Natale & Cicogna, 2002), only differences were examined and not associations. Second, there is an inherent bias in this sample toward Internet users and people willing to take part in panel surveys. Furthermore, all respondents live in the same country; consequently, environmental and/or social factors were not taken into account. Third, because media use was measured with memory-based tools, all behavioral data should be regarded as reported rather than actual.

Accordingly, future research should investigate the effects of morningness-eveningness on media use by applying more sensitive scales (e.g., morningness-eveningness scales and media diaries), including additional variables (e.g., media genre preferences), and examining more audiences (e.g., people who do not use the Internet and those from various cultural contexts and geographical areas). Because night persons appear to be ahead of others in terms of technology adoption, further studies should also apply longitudinal methods to explore trends in the technological gap between morning and night persons. Additional attention should be given to the roles morningness plays in forming and activating media habits and its interrelatedness with other internal and external cues. Finally, both qualitative and quantitative methods should be applied to determine whether night persons' technological jet lag represents a coping strategy that promotes adjustment to societal clocks.

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