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Sleep and Moral Awareness

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Abstract: The implications of sleep for morality are only starting to be explored. Extending the ethics literature, we contend that because bringing morality to conscious attention requires effort, a lack of sleep leads to low moral awareness. We test this prediction with 3 studies. A laboratory study with a manipulation of sleep across 90 participants judging a scenario for moral content indicates that a lack of sleep leads to low moral awareness. An archival study of Google Trends data across 6 years highlights a national dip in Web searches for moral topics (but not other topics) on the Monday after the spring time change, which tends to deprive people of sleep. Finally, a diary study of 127 participants indicates that—within participants—nights with a lack of sleep are associated with low moral awareness the next day. Together, these three studies suggest that a lack of sleep leaves people less morally aware, with important implications for the recognition of morality in others.

Moral awareness is defined as “a person’s determination that a situation contains moral content and legitimately can be considered from a moral point of view” (Reynolds, 2006a, p. 233). Without moral awareness, people are unlikely to effectively engage in moral judgment (Rest, 1986) or accurately judge the morality of others (Gino & Bazerman, 2009). Given the social and semi-public nature of much of human behavior, moral awareness is important in that it determines whether or not people detect moral content in others’ behavior. Indeed, the monitoring of the behavior of others is an important determinant of whether or not someone is willing to behave in a manner that harms others (Tenbrunsel & Messick, 1999). With high moral awareness, people can detect unethicity in the behavior of peers and other third parties. In other words, moral awareness is important in perceiving one’s own behavior as well as the behavior of others.

To date, research examining moral awareness has typically focused on characteristics of an issue (Reynolds, 2006), individual traits (Reynolds, 2008), or social-contextual factors such as leadership (Kalshoven, Den hartog, & De Hoogh, 2013). However, recent research indicates that moral awareness may also depend on unstable features of the person like energy and state self-control (Gino *et al.*, 2011), which can change over time and with sleep (Barnes, Schaubroeck, Huth, & Ghumman, 2011). This opens a view of moral awareness that is dynamic over time within a given individual. Specifically, we contend that moral awareness is driven in part by sleep, which is potentially of great importance given recent data indicating the prevalence of sleep deprivation (Barnes, Wagner, & Ghumman, 2012; Kronholm *et al.*, 2008).

The purpose of this paper is to extend the ethics literature by examining the influence of sleep on moral awareness. Moving beyond previous research examining the influence of one’s own sleep on one’s own morality, we test the hypothesis that a lack of sleep will hinder moral

awareness in general (which is important in recognizing moral issues in the behavior of others). To do so, we conduct three diverse studies: an archival study of Web searches, a four-day diary study, and a laboratory experiment. Collectively, these studies suggest that a lack of sleep undermines moral awareness, answering open questions in both the sleep and morality literatures and highlighting important implications for practice.

SLEEP AND MORAL AWARENESS

A growing body of research highlights the importance of sleep for cognitive processes (Lim & Dinges, 2010). Underlying this research is a theme: a lack of sleep leads to difficulty directing and maintaining attentional processes (Harrison & Horne, 2000). In particular, a lack of sleep appears to disproportionately impact the prefrontal cortex, a region of the brain heavily involved in alertness and attention (Altena *et al.*, 2008; Thomas *et al.*, 2000). This is likely because insufficient sleep leads to a decline in the metabolism of glucose in the prefrontal cortex (Altena *et al.*, 2008; Thomas *et al.*, 2000), which is problematic because glucose serves as fuel for cognitive activity (Fairclough & Houston, 2004). This is consistent with research indicating that the prefrontal cortex is heavily involved in attentional control (Langner & Eickhoff, 2013), and that sleep deprivation leads to difficulties controlling attention (Lim & Dinges, 2010). The upshot is that a lack of sleep leaves people low on the fuel needed by the brain structures that direct attention. As we discuss below, we posit that this has important implications for moral awareness.

Previous research has explored the topic of sleep and cognition in the domain of morality. Killgore *et al.* (2007) found that sleep deprivation led to greater difficulty in deciding upon a course of action in emotionally evocative moral dilemmas, as well as greater willingness to agree with solutions that violate personally held moral beliefs. Olsen *et al.* (2010) found that long-term

partial sleep deprivation impaired the ability of military officers and officer cadets to conduct mature and principally oriented moral reasoning. Tempesta et al. (2011) found that sleep deprivation led to faster response speeds for moral impersonal dilemmas, likely due to a disinhibition process. Olsen, Pallesen, and Espevik (2013) found that partial sleep deprivation hindered military officers' ability to anticipate problems within the moral domain.

Despite this fruitful literature, researchers have yet to examine the effect of sleep on moral awareness. In contrast to the individual difference of moral attentiveness—defined by Reynolds (2008: 1028) as “the extent to which an individual *chronically* (emphasis added) perceives and considers morality and moral elements in his or her experiences”—moral awareness is more fluid within a given individual (Reynolds, 2006a), driven in part by temporary states and contexts. Thus, moral attentiveness is akin to a personality trait, and thus, stable over time, whereas moral awareness may change from moment to moment. This opens the possibility for moral awareness to be influenced by dynamic antecedents, such as sleep. Indeed, although moral attentiveness tends to be positively related to moral awareness because of a tendency to be on the lookout for moral content (e.g., Reynolds, 2008), the relatively modest correlations between the two indicate that even those high in moral awareness can miss moral content. Thus, people high in moral attentiveness may still be vulnerable to the effects of sleep, which vary on a daily basis (c.f. Barnes, Wagner, & Ghumman, 2012).

Drawing from this research, we posit that in order to bring a moral issue into conscious moral awareness, people must go through an effortful process of directing attention to the issue that is undermined by a lack of sleep. This expectation is consistent with Gino *et al.*'s (2011) finding that energy for self-control in cognitive processes is positively related to moral

awareness. Accordingly, we hypothesize that a lack of sleep will lead to low levels of moral awareness. In the three studies noted below, we test this hypothesis.

STUDY 1

Method

Participants

We targeted an 80% probability of detecting a moderate effect size (.3) using a conventional cutoff ($\alpha=.05$). That power calculation calls for a sample size of just over 80 participants. We sampled slightly more than that in order to be sure that the final sample would meet the power analysis. We recruited 90 university students enrolled in a junior-level business course in Singapore to participate in a study of negotiation and emotion in exchange for course credit. Participants signed up for the study online and were then assigned to either a control condition ($N = 41$), or a sleep deprivation condition ($N = 49$). Participants averaged 21.9 years old, and 51.1% were male. 92% self-identified as ethnically Chinese, 3% as Indian, 3% as Vietnamese, and 1% as Malay.

Procedure

All participants who signed up for the study were instructed to report to an on-campus classroom the morning of the study. The subsample assigned to the sleep deprivation condition were also instructed to complete a survey (consisting of the PANAS short form; Mackinnon *et al.*, 1999; Watson, Clark, Tellegen, 1988) once per hour on the hour, from 11pm until 8 am, throughout the night before the on-campus session (held at 10 or 11 am). These participants received an hourly email containing the survey link and were told that they must complete the survey within 15 minutes of receiving it to remain eligible for the study (in actuality, all participants were retained).

The next day, participants arrived at the in-person session and, after completing a brief task for an unrelated study on negotiation, were asked to read the Reynolds's (2006a) scenario which involved an ethical violation (see Appendix A). We measured moral awareness using a scenario and scale provided by Reynolds (2006a), consisting of three items answered on a 5-point Likert scale (see Appendix B). Ethics approval was provided by Johns Hopkins University, and informed consent was conducted electronically.

Results

Participants in the sleep deprivation condition completed an average of 7.72 of the 10 hourly overnight surveys ($SD=2.76$). As a manipulation check, participants self-reported the number of hours that they had slept the prior night. A t-test indicated that participants in the sleep deprivation condition slept significantly less ($M = 4.35$ hours, $SD = 2.06$) than did those in the control group ($M = 6.43$ hours, $SD = 1.65$; $t = 5.31$, $p < .01$).

In conducting the t-test, we also tested whether the two groups (sleep deprived vs. control) exhibited equivalent amounts of variance in detecting the moral aspects of the scenario. Results of Levene's test of homogeneity of variance (Levene, 1960) revealed that the morality ratings in the two groups were heteroscedastic ($F[1,88] = 8.06$, $p < .01$). Therefore we conducted the t-test without the assumption of equivalent variances between the two groups. Results indicate that sleep-deprived participants were less aware of the scenario's moral content ($M = 3.73$, $SD = 1.10$) than were participants in the control group ($M = 4.11$, $SD = .70$), and this effect was statistically significant ($t = 2.02$, $p < .05$). These results indicated that a decrement of 2.1 hours of sleep led to 10% lower levels of moral awareness, supporting our hypothesis. These results indicated that a decrement of 2.1 hours of sleep was associated with 10% lower levels of moral awareness, in general support of our hypothesis. Moreover, the fact that moral awareness

differed between the conditions despite random assignment of participants to condition is consistent with the idea that we measured moral awareness rather than the more stable construct of moral attentiveness.

STUDY 2

Previous research indicates that on the Sunday night immediately following the Spring change to Daylight Saving Time (commonly called DST or “springing ahead”), Americans sleep about 40 minutes less than on comparison days—leaving them short on sleep on that Monday (Barnes & Wagner, 2009). Indeed, several studies indicate negative effects on the Monday immediately following the change to Daylight Saving Time (Barnes & Wagner, 2009; Kantermann, Juda, Merrow, and Roenneberg, 2007; Wagner, Barnes, Lim, and Ferris, 2012). Therefore, Study 2 used the spring change to DST as a natural quasi-experiment. Specifically, we compared moral awareness on the Monday immediately after the change to DST with moral awareness on the preceding and following Mondays.

Method

Measure

To measure moral awareness, we examined Web searches conducted in the United States from 2008-2013. In 2012, 65% of all search engine queries went through Google (Search Engine Land, 2012). Google Trends (www.google.com/trends) tracks these searches and allows public access to aggregated versions of the data. Broder (2002) notes that people conduct Web searches for three purposes: 1) navigational, with intent to reach a particular site, 2) informational, with intent to acquire information assumed to be on the page they seek, or 3) transactional, with intent to perform some Web-mediated activity. Each of these purposes suggests that Web search activity reflects what searchers are thinking about when making their queries. Thus, Web

searches should generally reflect conscious cognitive activity, and should be a reasonable proxy for content of which searchers are actively aware. With respect to our study, the most direct indicator of moral awareness would be Web searches related to morality itself.

To generate a list of words associated with morality, we started by querying www.thesaurus.com for synonyms of the word “moral,” retaining that word and all synonyms that the three authors unanimously determined were not slang, did not have alternative non-moral meanings, and were commonly used. To supplement and validate this list, we conducted a word frequency count on an ethics textbook (Trevino & Nelson, 2010), and selected the most frequent words that the three authors unanimously agreed had moral content. Collectively, these processes produced 22 words, which served as the content for our examination of Web search frequency; we refer to these as the Moral Words category. In order to eliminate the potential alternative explanation that all Web search activity declines following the shift to DST, we compared searches for words in the Moral Words category against the broadest possible comparison group of searches—those contained in Google’s set of 25 categories into which all Google searches are organized. We refer to these as the Google General Categories. Table 1 includes the list of Moral Words and Google General Categories.

To validate that the terms in our Moral Words condition were higher in moral content than the Google General Categories, we conducted a pilot study with 103 independent workers from Amazon’s Mechanical Turk (MTurk) service. MTurk is a service provided by Amazon that enables people to post projects online for paid workers to complete. Buhrmester, Kwang, and Gosling (2011) provide evidence that research projects conducted on MTurk yield data meeting high psychometric standards. In the current pilot study, participants rated the degree to which each word or Google General Category had anything to do with morality on a scale from 1 to 5.

R_{wg} , ICC(1) and ICC(2) values of .789, .682, and .995, respectively, indicated very high agreement across raters. This justified aggregation across raters to the word level of analysis. On a 5 point scale, ratings of moral content of the terms in the Moral Words category (mean=4.51) were significantly higher than ratings of the moral content of Google General Categories (mean=2.05; $p < .001$, $F = 407.32$). Thus, we contrasted Web search activity (reflecting cognitive awareness) of searches on terms in the Moral Words category against searches falling into the Google General Categories.

Procedure

Using Google Trends, we downloaded daily search volume for each of the terms described above. We focused on searches conducted within the United States from the years 2008 through 2013, using the terms validated in our pilot study. Search volume made available by Google Trends is quantified as an index, normalized against the search volume for the region and dates specified in the search query. For each of the years in our query we examined searches on the Monday immediately following the change to DST, as well as the immediately preceding and following Mondays (i.e., the comparison days). This controls for any day-of-the-week or season-of-the-year effects. Thus, the archival data included in this study included 47 search terms across 6 years, with 3 examined days for each word-year. In total, this included 846 separate data points, with each data point representing search behavior across the entire United States on the given day.

Results

This research design entailed multiple observations per search word over time. This nesting violates the assumption of observation independence required by ordinary least squares (OLS) regression analysis. Hence, we used a hierarchical linear modeling (HLM) framework,

which accounts for non-independence of observations (Raudenbush & Bryk, 2002). The HLM analysis had three levels: three Mondays (Level 1) nested in each of six years (Level 2) nested in each search term (Level 3).

In order to test the hypothesis that a lack of sleep leads to a decrease in moral awareness, it is important not only to show that searches associated with moral awareness decline on the Monday immediately following the change to DST, but that this does not simply reflect a decline in Web searches in general. Thus, we examined the interaction between day and search category (moral words versus Google General Categories). The main effect of day was not significant ($B=-.04, p=.11$), suggesting that Web searches in general do not differ on the Monday after DST. In support of our hypothesis, however, the interaction was significant ($\beta= -0.16, p<.05$), such that the change to DST resulted in a decline in Web searches associated with moral words, but no decline associated with the general Google categories (see Figure 1). This finding supports our hypothesis, indicating that a lack of sleep is associated with lower moral awareness.

STUDY 3

Study 3 extends this research to a within-persons approach. Specifically, we used a diary design in which participants, each day for four days, recorded their previous nights' sleep and completed a measure of moral awareness at that moment. One strength of this within-person design is that it parses out any between-individual differences in need for sleep. Participants completed the entry survey on a Thursday, which captured demographic information and described the procedure for the rest of the study. Participants completed daily surveys containing the other measures the following week.

Method

Participants

We recruited 127 MTurk participants residing in the United States. Participants had a mean age of 33.61 (SD = 12.2). 82% of participants were Caucasian, 9% were Asian/Pacific Islander, 4% were African-American, 3% were Latin-American, and 2% listed “other”. In total, participants completed 447 out of the 508 possible daily surveys, for an average within-participant response rate of 88%. Ethics approval was provided by Johns Hopkins University, and informed consent was conducted electronically.

Measures

Sleep. We measured sleep with the Pittsburgh Sleep Diary (Monk *et al.*, 1994). Participants were asked what time they went to bed the previous night, how long it took them to fall asleep, how much of the night they were awake, and what time they finally awoke in the morning. This measure correlates highly with objective sleep measures (c.f. Barnes *et al.*, 2011).

Moral Awareness. We measured moral awareness using scenarios and items provided by Reynolds (2006a). Reynolds’ Study 2 provides four morality-related scenarios that were specifically designed for use in within-participant research designs. Accordingly, in each of the four daily surveys, we presented one of the four scenarios (see Appendix C). After reading the scenario, participants completed the Reynolds (2006a) measure of moral awareness, consisting of three items answered on a 5-point Likert scale (average $\alpha=.89$). An example item reads: “There are very important ethical aspects to this situation” (1= *strongly agree* to 5 = *strongly disagree*).

Results

This within-participant design entailed multiple observations per participant. Thus, as in Study 1, we used HLM to analyze the data using a multilevel format that accounts for non-

independence of observations (Raudenbush & Bryk, 2002). Substantive variables for the analysis were at Level 1, with participant ID number at Level 2.

Mean participant sleep across days was 436 minutes (SD = 83 minutes). Mean moral awareness across days was 3.36 (SD = 1.11). HLM analysis indicated a significant effect of sleep on moral awareness ($\beta=.12, p<.05$), supporting our hypothesis. The more participants slept, the greater was their moral awareness. Moreover, this was specifically the case when judging the behavior of other people, meaning that people will be less likely to notice unethical behavior in others when short on sleep. It is worth noting that the fact that there was variance in moral awareness across days within a given individual is consistent with our contention that we were measuring moral awareness rather than moral attentiveness.

Discussion

A large literature indicates that, in part due to juggling multiple demands on their time, people often restrict their sleep (e.g., Barnes *et al.*, 2012). Thus, many people are short on sleep on any given day. Moreover, this is a trend that is worsening over time (Kronholm *et al.*, 2008).

Drawing from research in both sleep physiology and moral psychology, we hypothesized that a lack of sleep would lead to decrements in moral awareness. To test this hypothesis, we conducted three very different types of studies: a large-scale study of archival data, a diary study, and a laboratory experiment. All three studies supported our hypothesis, indicating that the individuals who slept least were the least morally aware and thus least able to recognize unethical behavior in others. In addition to different methodologies, these three studies used two separate operationalizations of moral awareness, suggesting that the finding is robust. Moreover, the experimental design of Study 1 provides general support for the causal nature of the

relationship, indicating that a 2.1 hour decrement in sleep led to a 10% decrement in moral awareness.

Important in the findings of Study 2 is that the influence of sleep seems to be focused on moral awareness rather than awareness in general. Indeed, the null effect of daylight saving time on searches for non-moral content, in contrast to the negative effect of daylight saving time on searches for moral content, is consistent with this view. It appears that although a lack of sleep may have negative impacts on cognitive function in general, this effect is especially strong for moral awareness.

These 3 studies had complementary strengths and limitations. Study 1 was a true experiment, with a manipulation of sleep, random assignment to conditions, and entailed measuring moral awareness on an established scenario specifically developed to include an ethical violation. However, the research was conducted in an artificial setting, and we did not control the behavior of people in the experimental condition beyond depriving them of sleep.

Study 2 examined an extremely broad sample, investigating naturally occurring behavior in the context of a quasi-experiment. However, differences in sleep were inferred based on previous research on the Daylight Saving Time effect rather than directly measured, and moral awareness was measured indirectly through a new method. These limitations make it difficult to specifically infer that a lack of sleep was the cause, as well as some uncertainty as to the precision with which search behavior reflects moral awareness.

Study 3 examined moral awareness across 4 scenarios, using a diary study design. This within-individual approach parses out between-individual differences in need for sleep, and measured moral awareness more directly using an established method. However, it is possible that natural variation in sleep was driven in part by an unmeasured variable that could also

influence moral awareness. Moreover, it is possible that MTurk participants, who were provided a financial incentive to complete this research, differ from people who do not participate in MTurk in a manner that would be relevant to our results.

Across all three research designs, using 2 very different measures of moral awareness, convergence in the results indicate support for our hypothesis. This type of triangulation of methods should aid in confidence in our results. Our finding that sleep influences moral awareness has important implications for ethical decision making and moral psychology in general. Not only is moral awareness a necessary precursor to conscious moral judgment and influential in determining ethical behavior, which has already been linked to sleep (Barnes *et al.*, 2011), but it is also important in judging the behavior of others. Without moral awareness, people make moral judgments of their own and others' behavior by default, either without considering the situation's moral features, or by relying on nonconscious processes. The latter is especially important in contexts where whistleblowing or peer influence to stop unethical behavior would be important, such that decrements in moral awareness may influence not only the actor but also people with whom the actor interacts.

Considered more broadly, our results suggest that demanding circumstances like long work hours or family conflict that cut into sleep may also reduce people's moral awareness. This matters because it is often these very circumstances that require people to make important moral decisions. Executives working long hours to meet a deadline, for example, may also have to decide whether to cut corners or how to portray substandard results. Our results, generalized broadly, would suggest that these executives may fail to perceive or act upon the moral implications of their policies. Similarly, graduate students working on restricted levels of sleep may be more likely to copy arguments from a published paper in their own work, police officers

working sleep-disrupting schedules may be less likely to notice or report their colleagues' mistreatment of suspects, senators working through the night on an amendment to the nation's budget may ignore the moral implications of their proposals, and obstetricians at the end of a 24-hour shift may make a treatment decision that violates the moral standards of their patients. In general, our results sound a cautionary note to anyone faced with making moral decisions after a short night's sleep. Moreover, broadening from previous work indicating that sleep is relevant to one's own propensity for unethical behavior (Barnes *et al.*, 2011), we extend this body of research by showing that a lack of sleep influences moral awareness in general—which is relevant not only to one's own behavior, but also to one's processing of others' behavior. Thus, it appears that a lack of sleep hinders one's likelihood of catching unethical behavior in others, a finding that is especially important for managers who are responsible for monitoring the behavior of subordinates.

Future research should more directly examine differential effects of sleep on moral awareness versus awareness of content in other domains. These comparisons would be helpful for advancing this science. Moreover, there may be different moderators of the effect across different domains. For example, it may be that people who are low in moral attentiveness are most vulnerable to the effects of sleep on moral awareness, but that moral attentiveness does not influence the effect of sleep on awareness of other content domains.

Future research should also examine strategies for addressing the negative effect of a lack of sleep on moral awareness. One such strategy would be to change organizational policies and practices in a manner that leads to lower levels of sleep deprivation in organizations. Barnes (2011) provides some recommendations that might be relevant, such as altering work schedules, tailoring stress reduction programs, and implementing nap facilities and programs. Another

approach would be to seek strategies that mitigate the effects of sleep on moral awareness. A final strategy for mitigating the effects of sleep on moral awareness would be to place cues around employees to prime them to think about ethics. Recent research indicates that even subtle cues can influence the manner in which people process ethics information (Leavitt *et al.*, 2010). It may be possible that the right set of environmental cues will remind people to look for and be aware of moral content in their organizational lives.

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Appendix A: Study 1 Vignette (from Reynolds, 2006)

One of your most important customers, a medical clinic, called yesterday. They had ordered a product 10 days ago (products are normally delivered within 7–10 days), but it had not arrived. Quickly, you traced the order to the shipping office. You asked the shipping clerk about the order and she said, “I shipped it two days ago!” As you left the shipping office, you glanced at her desk and saw her shipping receipts. You could clearly see that the order was shipped this morning. You called the clinic back to let them know the product was on its way. As you talked with them, you learned that the delay of the product had not affected any patients in any way.

Appendix B: Moral Awareness items (from Reynolds, 2006)

1. There are very important ethical aspects to this situation.
2. This matter clearly does not involve ethics or moral issues. [reverse coded]
3. This situation could be described as a moral issue.

Appendix C: Study 3 Vignettes (from Reynolds, 2006)

1. Last Monday, you were sitting at your desk examining a request that a customer had just faxed to you. The customer was proposing a project that would make a tremendous amount of money for your company but had an extremely demanding time schedule. Just as you were about to call the customer and accept the project, one of your employees, Phil, knocked on the door. He entered your office, politely placed a letter of resignation on your desk, and told you that he was sorry, but in two weeks, he would be moving to another state to be closer to his ailing parents. After he left, you thought about the proposed project and determined that even though Phil would be gone, you could still meet all of the customer's deadlines. You called the customer and accepted the project.

2. One of DenComp's manufacturing facilities contains five very large and very noisy pressing machines. The facility manager has always followed the state and federal regulations about noise control that apply to those machines, but the noise effects can never be completely eliminated. Doug, a long-time DenComp electrician who regularly works right next to the pressing machines (and always wears the proper equipment), came to your office and told you that his doctor has informed him that he has lost 80% of his hearing in his right ear, probably because of the work he does near the machines.

3. Earlier today, a DenComp salesman who works in Iowa called you and told you about an experience that he had last week. One of his customers placed a small order of about \$1,500 worth of product from DenComp's corporate headquarters. DenComp immediately shipped the

package through a freight company, and it arrived the next day at the freight company's warehouse in Iowa. The salesman went to the warehouse just as it was closing and talked to one of their managers. The manager said that everyone had gone home for the day, but he assured him that the package would be delivered directly to his office the next day. The salesman knew that the customer did not need the materials for at least another 3 days, but he didn't want to wait. He placed a twenty-dollar bill on the counter and asked the warehouse manager one last time if there was anything he could do. The manager found the paperwork, got the product from the back of the warehouse, and brought it out to the salesman.

4. A manager in your area, Terry, drives a company car. Company policy states that corporate cars are to be inspected every 3,000 miles without exception. Terry last had her car inspected about 5,000 miles ago—she says that she “just doesn't want to be bothered that often.” Today, Pat, a co-worker of Terry's, asked Terry for the keys to the car so she could deliver some artwork to a few customers. While driving on the highway, the car's breaks malfunctioned. The car spun out of control and came to a rest in a ditch on the side of the road. Pat's forehead struck the steering wheel, and she had to go to the hospital to get 18 stitches.

Table 1: Study 2 Search Terms

Moral Words	General Google Categories
Corrupt	Arts & Entertainment
Ethical	Autos and Vehicles
Ethics	Beauty & Fitness
Evil	Books & Literature
Fair	Business & Industry
Fairness	Computer & Electronics
Fraud	Finance
Guilty	Food & Drink
Honest	Games
Honesty	Health
Honorable	Hobbies & Leisure
Humane	Home & Garden
Immoral	Internet & Telephone
Integrity	Job & Education
Moral	Law & Government
Principle	News
Principles	Online Communities
Sin	People & Society
Sinful	Pets & Animals
Steal	Real Estate
Truth	Reference
Unethical	Science
	Shopping
	Sports
	Travel

Figure 1: Interaction between Sleep Category and Search Category on Standardized Search

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