

One Hour of Lost Sleep Impacts Financial Markets: Daylight Saving Time Compromises Financial Trading

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INTRODUCTION

A lack of sleep has negative effects on motivational-effort and optimal decision-making (Krause et al., 2017). However, whether sleep loss impacts real-life financial choice behavior, en masse, has yet to be examined.

OBJECTIVES

Here, we tested the hypothesis that a 1-hour sleep manipulation, imposed by daylight saving time (DST), influences appetite for financial decision-making in financial markets.

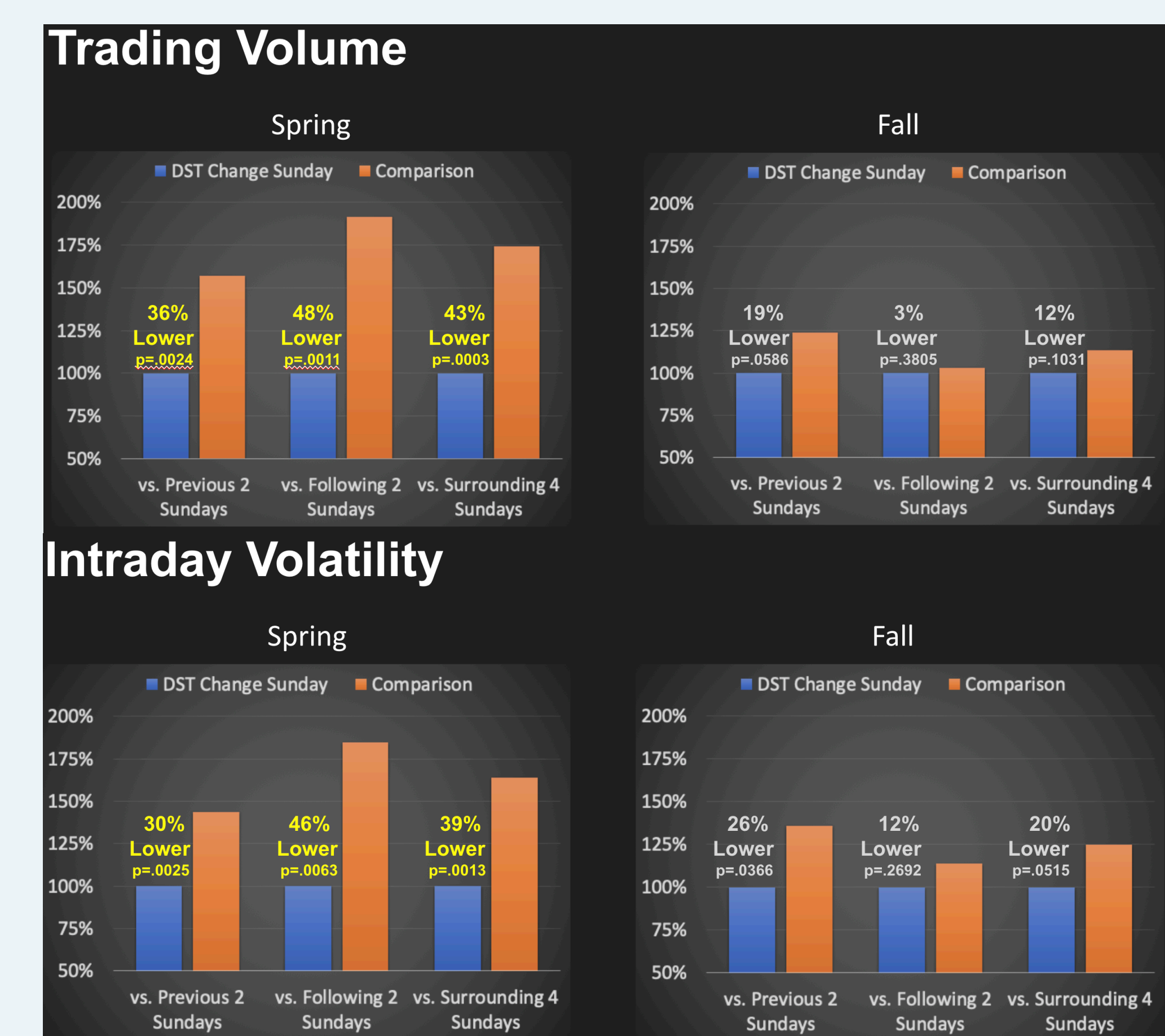
METHODS

Trading activity of E-mini S&P 500 Futures contracts was analyzed on each Sunday after DST change from 2002-2019, compared with the surrounding Sundays (N=165 trading days, N=6.17 million contracts). Based on the hypothesis of sleep-loss impairments in motivational drive and effort, analyses focused on daily trading volume (representing cumulative trading activity) and intraday volatility (representing price variations linked to trading activity).

One Hour of Lost Sleep Compromises Financial Market Trading Activity

RESULTS

Following the Spring DST change, resulting in a 1-hour loss of sleep opportunity, both these effort-based trading metrics dropped significantly (39-43%), relative to the surrounding Sundays ($p=0.0003-0.0013$). Following the Fall DST change, providing a 1-hour increase in sleep opportunity, there was no significant relative change in these trading metrics. Together, these findings establish that a modest reduction in sleep opportunity (1-hour) significantly impacts trading activity, while a converse increase in sleep opportunity (Fall DST) may not be capitalized upon by individuals, obviating a beneficial behavioral effect.



DISCUSSION

These results support a biological framework of sleep loss reflecting a marked state of impaired motivational-effort. Moreover, such data illustrate how even very subtle, ecologically common, reductions in sleep time across the population can have non-trivial societal and economic ramifications.