Inclination to speeding and its correlates among two-wheeler riding Indian youth

Context: Concerns about road safety have been increasingly associated with two-wheeler riding and especially with young commuters in India. Aims: The study was designed to explore inclination to speeding and to profile the driving behaviors in two-wheeler riding young men and women who reported a tendency to ride faster than their peers. Design: A cross-sectional survey design was used. Materials and Methods: On the basis of three focus group discussions and review of literature, a survey was prepared to tap domains such as affect states associated with riding/spedding, factors contributing to speeding, inclination for competing, perceived speed and safety, etc. The study sample comprised of 961 two-wheeler riding college-going young men and women in Bangalore. Statistical Analysis: Descriptive and inferential statistical procedures were used including Chi-square, Spearman’s rank correlation, and independent sample t-test. Results: The sample was divided into two subgroups on the basis of self-report of greater speeding than one’s peers. A subgroup of 349 participants endorsed the item regarding inclination to ride faster than one’s peers, whereas, the remaining 612 participants did not endorse it. The profiles of these two subgroups were obtained in terms of sociodemographic variables, riding behaviors, and associated domains. Significant differences between the subgroups emerged on domains such as motives for riding fast, tendency for competing, perceived safety and frequency of minor accidents while riding. Conclusions: Several correlates of the tendency to speeding among young two-wheeler riders emerged that have implications for enhancing safe riding.

Keywords: Risk-taking, road safety, speeding, two-wheeler riders

Motorized two-wheelers comprise more than 70% of all motor vehicles in India. Motorcyclists along with pedestrians are among the most vulnerable road users. Speeding and risk-taking among young motorcyclists pose a major public health challenge. Alarming rates of 38% of road-traffic fatalities and 51% of nonfatal road-traffic injuries involve two-wheeler riders in India, and 75% of fatalities and 82% of non-fatal injuries occur in the age group between 15 and 44 years, while 50% of the accidents involve commuters between 20 and 30 years of age. Speeding accounts for 30% of all traffic fatalities and often involve young commuters.

Speed may be either excessive (driving above the speed limit) or inappropriate (driving within limits but too fast for the traffic condition) and it poses risk by way of shorter time to react for avoiding an accident as well as greater impact if accident occurs. Riding fast may be influenced by psychological factors, such as beliefs and perceptions associated with speeding, motives for speeding including impression management, perceived speed and safety, temperamental and attitudinal factors such as sensation seeking and risk-taking, and other factors such as desire to reduce travel time, stress, and affect states.

Theoretical perspectives on health beliefs, attitudes and behaviors are useful for understanding riding behaviors as well as for planning behavioral change in motorcyclists. Some of the theoretical models proposed in the context of riding fast and other risk-taking behaviors include the theories of reasoned action (TRA) and of planned behavior (TPB), health belief model (HBM), social comparison theory or contagion theory of speeding, and so on. The TRA helps
to describe how normative and attitudinal beliefs influence intentioned action in the context of riding a two-wheeler. TPB incorporates perceived behavioral control into the TRA framework. HBM is another theoretical framework that helps in understanding safe versus unsafe riding. According to HBM perception of risk, benefits, and barriers influence safe/unsafe riding behaviors such as rule keeping and speed regulation.[9] In general, these theories underscore the role of appraisals, beliefs, and attitudes in shaping riding behaviors, such as those associated with riding fast and risk-taking. But it is also proposed that speeding inclination may not be explained as much by attitude towards riding fast or beliefs/perceptions about consequences of speeding as by the rider’s comparison of one’s own speed with that of other drivers (contagion theory).[10] The perception of one’s tendency to speed in comparison to others is the point of departure for the present study.

Addressing the problem of excessive speed and the factors associated with it is crucial for road safety promotion. While traffic regulations and law-enforcement are major concerns, understanding the subjective perception of the two-wheeler rider from a psychological perspective is very important for identifying factors contributing to speeding inclination as well as for planning intervention to modify such factors. In this context, it is important to understand in what ways motorcyclists who in general tend to ride fast are different from those who do not have a speeding inclination. There has been very little scientific research that addresses the need to understand psychological factors associated with driving behaviors in the Indian context, especially among motorized two-wheeler users. The present study addresses the need to understand young two-wheeler riders’ self-reported speeding inclination and other psychological factors linked to it.

**MATERIALS AND METHODS**

This study was designed to explore inclination to speeding among two-wheeler riding college youth in urban India. It also aimed to profile the perceptions, attitudes, and behaviors associated with driving among two-wheeler riding young men and women who report a tendency for riding faster than their peers. Inclination to speeding was defined as self-reported affinity to ride faster as compared to average two-wheeler rider of the same age in different road/traffic conditions. This paper is based on a part of the two-wheeler rider survey data from a larger project which explored psychological factors associated with aggressive riding and anger in two-wheeler riding Indian youth. Institute ethical clearance was obtained before the study was initiated.

Survey method was used in the study. Focus group discussions with young two-wheeler riders were conducted along with review of literature for preparing the exploratory survey which tapped psychological factors linked to two-wheeler riding. The focal point for this paper was responses of participants on a single checklist item in the survey. Participants were instructed to give a tick mark against a statement if they agreed with it. The statement read, “I tend to ride faster than most people of my age”. Based on their responses two subgroups were identified and these were compared on self-reports on other factors in the survey. The relevant factors included general attitude to riding and riding behaviors, namely, engaging in competition and stunts, emotional states associated with riding, motives and factors associated with riding fast, and other riding behaviors involving thrill/sensation seeking, traffic violations, etc. The survey also elicited basic information on age, gender, years of riding, riding frequency, and self-report of riding speed.

Factors associated with speeding were tapped on a checklist of eight items where participants were asked to mark those items that they perceived as contributing to their riding faster than usual. Anticipation of a desirable state/outcome as a motive for riding fast was tapped on a set of five four-point Likert-type items. Sense of safety was assessed based on a checklist in which participants marked one of four statements which best reflected their perception about their riding as well as their report of others’ opinions on their riding in terms of being safe/risky. Approaches to riding such as chasing, overtaking, doing stunts, competing, etc., were tapped using checklist items. Traffic violations such as lane-hopping, difficulty in stopping at red signal as well as self-report of narrow escapes, minor injuries, and major accidents were captured using four-point Likert-type items.

After completing content validation of the items, the survey was administered in classroom settings from 14 colleges in Bangalore city. A total of 961 students who reported using motorized two-wheelers completed the survey. Sample comprised of 789 (82%) undergraduates and 176 (18%) postgraduates, and the age range was between 18 and 26 years, the average participant being 20 years of age. There were 692 (72%) men and 269 (28%) women participants, which reflected the male to female ratio of two-wheeler riding college students in the metropolitan city. The average participant reported 4 years of riding experience, and an average riding speed of 44 km/h and a maximum speed of 63 km/h within the city. Written informed consent was obtained from all participants before collecting the data.
RESULTS

The sample was divided into two subgroups on the basis of response to a single item about the tendency to ride faster than one’s peers. A subgroup of 349 (36%) participants endorsed the item regarding inclination to ride faster as compared to their peers (speeding subgroup or SSG); whereas, the remaining 612 (64%) participants did not endorse it (non-speeding subgroup or NSG). This item was found to have strong negative correlation (Spearman’s rho = −0.38, \(P < 0.001\)) with another checklist item which elicited tendency to ride slower than one’s peers (“I tend to ride slower than most people of my age”). Among NSG only 266 (i.e. 28% out of the total 961 participants) endorsed this item. These two items together distinguished 346 out of 961 participants (36%) who did not report that they tend to ride either faster or slower than their peers [Figure 1].

The profiles of these two subgroups (SSG and NSG) were obtained in terms of sociodemographic variables, riding behaviors, and associated domains. These subgroups were comparable on Mean age (\(t = −0.88, P = 0.38\)). But, on the number of riding years, the subgroups had a statistically significant Mean difference (\(t = 4.08, P < 0.001\)), which meant in a given age group greater riding years were positively associated with greater inclination to speeding. There was a significant gender difference (\(\chi^2 = 18.37, P < 0.001\)), men reporting greater speeding inclination. Out of 692 male participants, 280 (46%) reported inclination to speeding as against 69 (26%) out of 269 female participants.

Significant differences between the subgroups were found on domains such as motives (e.g., experience of power, relief from anger, boredom, etc.) and other factors (e.g., competing with other drivers, presence of a girl/boyfriend as pillion rider) associated with riding fast. Subgroup differences were significant also on other riding behaviors such as tendency for weaving, wheeling, lane-hopping, chasing other drivers, riding on footpath, use of cell phone while riding, and tendency for signal jumping. But on other reasons for riding faster than usual such as hurry, relief from heavy traffic, drinking, and anger or sadness of mood as trigger for riding fast the two subgroups were not significantly different [Tables 1 and 2].

The SSG when compared with the NSG reported a significantly higher tendency to anticipate reaching the desired mental states through speeding such as a sense of power, sense of joy, relief from anger, relief from boredom, and relief from what is causing distress. Further, on items associated with thrill-seeking and impulsivity such as speeding even when not in a hurry; liking for chasing, competing, overtaking, lane-hopping, weaving, and practice of stunts; and difficulty in stopping when signal turns red; the SSG reported significantly higher inclination than their counterparts [Tables 1 and 2].

The study observed two different ways in which emotions played a role in speeding, such as, emotional states as triggers for speeding (e.g., anger and sadness of mood) and anticipated positive emotional states (e.g., a sense of joy and relief from anger/boredom) as motives for speeding. There was a significant difference on all three items of positive emotional states anticipated through speeding, indicating that SSG had a greater tendency for seeking to experience these emotional states as motives for speeding. On the other hand, the subgroups did not report difference with regards to emotional states as speeding triggers [Table 2].

The participants’ attitude to safe riding versus tendency for risk-taking was explored by combining their subjective perception about their riding and their report of others’ opinion. The subgroups differed significantly in their self-report regarding safe-riding (\(\chi^2 = 34.51, P < 0.001\)). Among the NSG, 432 (71%) reported that they perceive themselves to be riding safely and that they believe

![Figure 1: Self report of participants on their approach to speeding as compared to their peers](image-url)

![Figure 2: Safe riding and accidents. SSG = Speeding subgroup, NSG = non-speeding subgroup](image-url)
they are considered to be riding safely by other people as well. Of the SSG, 182 (53%) reported riding safe as their self-perception as well as opinion of others. One hundred and five (30%) of SSG reported that their riding is considered to be “not very safe” by others, although they continue to perceive themselves as safe riders. Thus, a total of 83% of SSG reported a self-perception of safe riding. Finally, 58 out of 349 SSG (17%) reported perceiving themselves as “taking more risks than necessary” while riding [Figure 2].

Accidents or narrow escapes were also explored through self-report which tapped near-misses (narrow escapes) or minor injury during the previous 6 months and any major accident during 1 year. There was a significant difference between the subgroups on self-report of occurrences of near misses ($\chi^2 = 6.84, P = 0.010$), but not on self-report of both minor and serious accidents. Eighty (24%) out of 349 SSG participants reported high (a few times/many times) on near-misses as against 99 (17%) from the NSG [Figure 2].

**DISCUSSION**

The study explored the correlates of inclination to speeding among young college going two-wheeler riders. Among sociodemographic factors, speeding inclination was found associated with male gender and greater riding years for a given age. While greater speeding in male riders is a finding in line with other studies as well as common perception, there was also a sizeable percentage of female riders who reported a tendency to ride faster than most people of their age. This underscores the need for gender inclusive road safety promotion programs.

In this sample of young motorcyclists, for a given age, more years of riding was linked to greater tendency for riding fast. The finding held good separately for males and females, too. This is in keeping with the finding in another study that increase in rider’s confidence associated with more riding years is a factor in risk-taking behavior while riding a two wheeler.

Higher speeding inclination was linked to affect states as speeding motives, that is, anticipation of desirable emotional states sought to experience through speeding or expectation of relief from undesirable emotional states through speeding. While this finding needs replication, anticipated desirable outcome from speeding have been observed in another study.

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**Table 1: Correlates of inclination to speeding: Subgroup differences**

<table>
<thead>
<tr>
<th>Tendency for thrill seeking/impulsivity factors</th>
<th>Mean difference in percentage</th>
<th>$\chi^2$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liking for chasing and competing</td>
<td>51</td>
<td>1.21</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Liking for competing with friends</td>
<td>58</td>
<td>25.2</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Speeding and overtaking</td>
<td>55</td>
<td>44.9</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Liking for weaving</td>
<td>27</td>
<td>25.3</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Liking for practice of stunts</td>
<td>22</td>
<td>35.1</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Speeding even when not in a hurry</td>
<td>39</td>
<td>25.3</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Difficulty in stopping at red signal</td>
<td>23</td>
<td>10.3</td>
<td>$&lt;0.001$</td>
</tr>
</tbody>
</table>

SSG=Speeding subgroup, NSG=Non-speeding subgroup

**Table 2: Triggers/motives for speeding: Subgroup differences**

<table>
<thead>
<tr>
<th>Experiences sought as a result of riding fast</th>
<th>Mean difference in percentage</th>
<th>$\chi^2$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sense of power and control</td>
<td>59</td>
<td>65.1</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Sense of joy</td>
<td>75</td>
<td>56.9</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Relief from anger</td>
<td>34</td>
<td>23.7</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Relief from boredom</td>
<td>25</td>
<td>12.4</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Relief from a cause of distress</td>
<td>32</td>
<td>13.2</td>
<td>$&lt;0.001$</td>
</tr>
</tbody>
</table>

SSG=Speeding subgroup, NSG=Non-speeding subgroup

<table>
<thead>
<tr>
<th>Other reasons/triggers for speeding</th>
<th>Mean difference in percentage</th>
<th>$\chi^2$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competing</td>
<td>40</td>
<td>36.8</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Presence of girl/boy friend</td>
<td>23</td>
<td>17.5</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Hurry</td>
<td>75</td>
<td>0.09</td>
<td>$=0.76$</td>
</tr>
<tr>
<td>Relief from traffic</td>
<td>48</td>
<td>1.01</td>
<td>$=0.31$</td>
</tr>
<tr>
<td>Drinking</td>
<td>7.6</td>
<td>0.04</td>
<td>$=0.79$</td>
</tr>
<tr>
<td>Anger as trigger</td>
<td>24</td>
<td>0.51</td>
<td>$=0.47$</td>
</tr>
<tr>
<td>Sadness of mood as trigger</td>
<td>17</td>
<td>1.4</td>
<td>$=0.22$</td>
</tr>
</tbody>
</table>

**Table 1**

**Table 2**
study in which perception of pleasurable speed and safe speed were found to contribute to speeding.\textsuperscript{[13]} Other studies have suggested that positive emotional appeal in road safety promotional programs may have greater influence on riders than negative emotions.\textsuperscript{[14]} While negative emotional states as trigger for speeding did not distinguish the two subgroups, SSG was more likely than NSG to report anticipated relief from negative emotional states as motive for speeding. Whether this is because intentionality and perceived benefits mediate the relationship between emotion and speeding needs to be examined by future research.

The study identified several correlates of the tendency to speeding, such as, risk-taking, rule-breaking, and sensation-seeking behaviors among young riders. Other studies have observed that these behaviors associated with driving tend to get habituated and therefore need to be addressed early in driving career.\textsuperscript{[9]}

The study has shown that more than 80% of those reporting inclination to speeding do not associate their riding with risk-taking or being unsafe and more than 50% hold a self-belief of riding safely. Similarly, 76% of those who tend to speed did not self-report more than one or two occurrences of near-misses (narrow escapes). This finding corroborates what Watson \textit{et al.}, found, namely, self-report of safe riding intentions (e.g., “keeping 100% awareness” and “handling motorcycle skillfully”) can coexist with that of risk-taking intentions (e.g., “push my limits” and “ride at maximum speeds”) since the two do not form part of the same continuum.\textsuperscript{[9]} According to Nell,\textsuperscript{[13]} risk-taking may have an adaptive function for young adults from an evolutionary perspective. From the point of view of road safety interventions that target speeding, screening for risk perception can help in planning a differential approach for those who perceive speeding as involving risk and for those who do not.

The subgrouping for inclination to speeding was based on self-report of relatively greater inclination to speeding (“faster than most people of my age”) and not on objective estimate of speeding among the sample. Nonetheless, the single item used for this subgrouping has shown considerable accuracy in capturing the phenomenon of speeding inclination as it showed consistency across self-reports on a number of other items in the survey which tapped aspects of speeding inclination and absence of it. This underlines the scope for its use as a single item screening tool for speeding inclination.

The study was conducted among college youth in a metropolitan city. Hence, there is need for caution in generalizing findings to non-urban and older population. The present study is one of the first in India to explore perceptions involving two-wheeler riding. It underscores the need for considering psychological factors while designing road safety promotion programs targeting young two-wheeler riders. The study highlights that inclination to speeding is linked to different risk-taking behaviors and triggering factors and motives, which need to be addressed together in any program for enhancing road safety. The role of emotions in speeding, especially anticipated positive emotional states (e.g., a sense of joy and relief from anger/boredom) as motives for speeding, call for particular attention in further research.

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**REFERENCES**


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