Embrace the Greenhorn:
Leading Engineering Teams While Under the Age of 30

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Abstract

Engineers in a management role deal with a variety of issues when leading a project; these issues can range anywhere from lack of subordinate drive to resource shortages. An often overlooked problem is the age difference between team members, specifically when the team leader is the youngest person in the group. This paper lays out common problems young engineering leaders often face and proposes a variety of solutions matched to different leadership styles, citing experiences from leaders in the automotive industry.

Key words: management; collaboration; ethics; society; leadership

1. Introduction

An abundance of research in leadership and team management has been performed in the last thirty years. Entire books have been written on the subject, such as Peter Northouse's *Leadership: Theory and Practice*, or more focused works such as Michael Hackman and Craig Johnson's *Leadership: A Communication Perspective*. There are typically breakdowns of ways leaders operate, focusing on Skill Theory [1], Style Theory [2], Path-Goal Theory [3] or Transformational Leadership [4] to just name a few. There are missing components to these types of work, applying to age groups inside of specific fields. There have been some studies that are close to this desired work, such as Florian Kunze and Heike Bruch's *Age-Based Faultlines and Perceived Productive Energy: The Moderation of Transformational Leadership*; but there were no definitive results [5]. This paper seeks to remedy this lack of research by surveying young engineering leaders in the automotive industry, focusing on one company, Nexteer Automotive.

2. Sources and Methods

Mechanical and electrical engineers under the age of thirty who managed a group or project were sent a survey that could be completed anonymously. Within this survey were several questions to determine the engineer's leadership style [6] [7], age and tenure at Nexteer Automotive. The engineers were also asked to describe the age, level, and tenure of their main adversary they have dealt with in their groups. After the baseline data was collected a series of follow up questions were asked to gather the engineer's perceived reasons they have had conflict in their team, singled out main perceived reason for conflict, ways they have tried to resolve the conflicts, and singled out main method that has worked for conflict resolution; a sample of the conflict

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questions can be found in Appendix A and a sample of resolution questions can be found in Appendix B. The full survey has been made public through Google[*].

3. Results

This study can be broken down into three main categories: leadership styles of young leaders, age and tenure differences observed in young leader groups, and successful conflict resolution methods for young leaders; these areas can be found in sections 3.1, 3.2, and 3.3, respectively.

3.1 Leadership Style

The leadership styles of the young engineers surveyed were determined using a grading rubric provided from the *Emergency Field Coordination Training Leadership Style Questionaire* [7]. The young engineers surveyed were overwhelmingly identified as having a Directive leadership style. However there were a few outliers in the Democratic or combined styles as can be seen below in Figure 1.
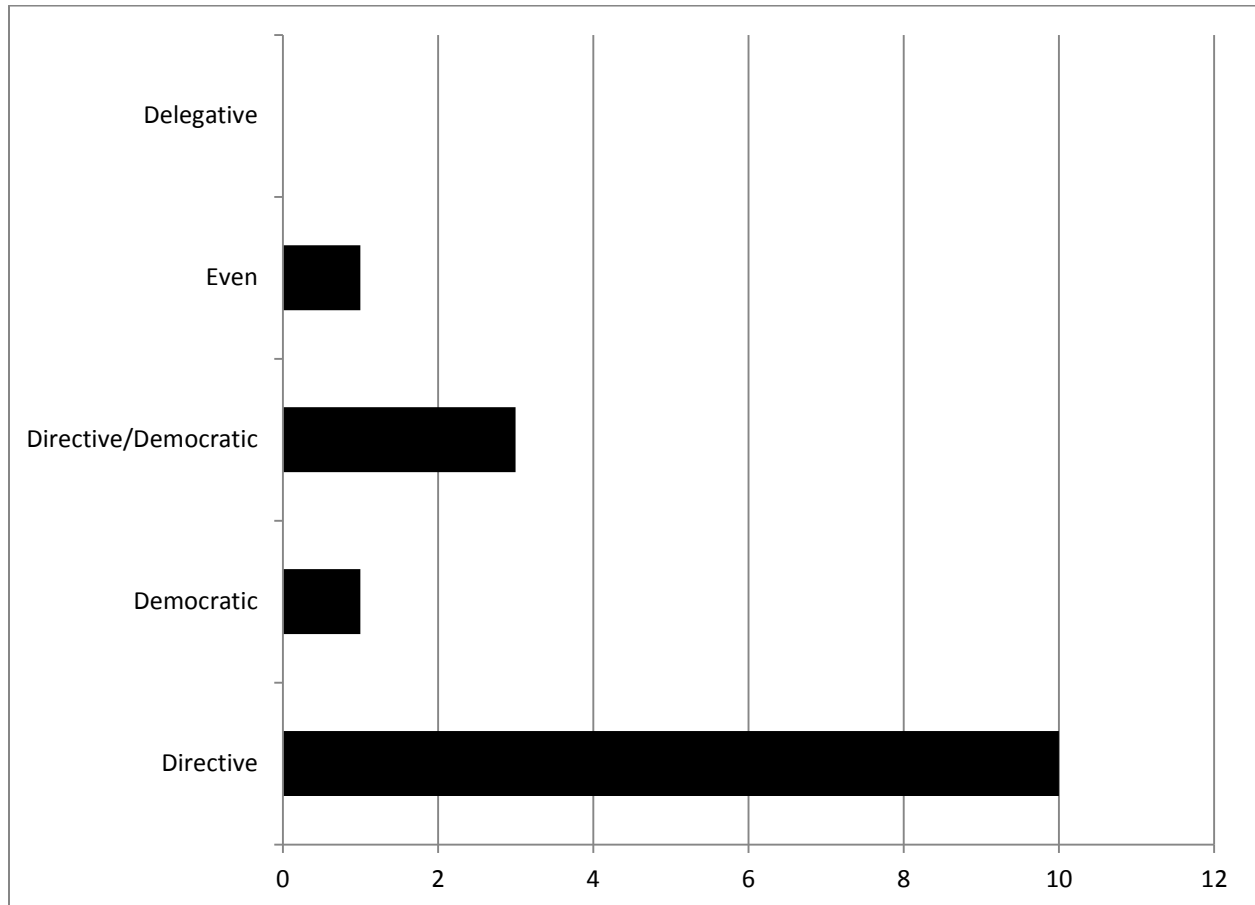

Figure 1. Leadership Styles of Young Leaders Surveyed

[*] Full survey can be found at: https://docs.google.com/forms/d/1FfPDE6mx713-xHnF5yrw_DL-WYkywXOD6Y3o2cQIulc/viewform?usp=send_form

3.2 Age and Tenure Differences

It was apparent that all main adversaries of the young engineering leaders had a longer tenure at their company. This holds true across age differences, and curiously was not always reported as a cause for conflict.

The young engineering leaders surveyed perceived the largest cause for conflict as "General Personality Incompatibility" as can be seen in Figure 2 below.
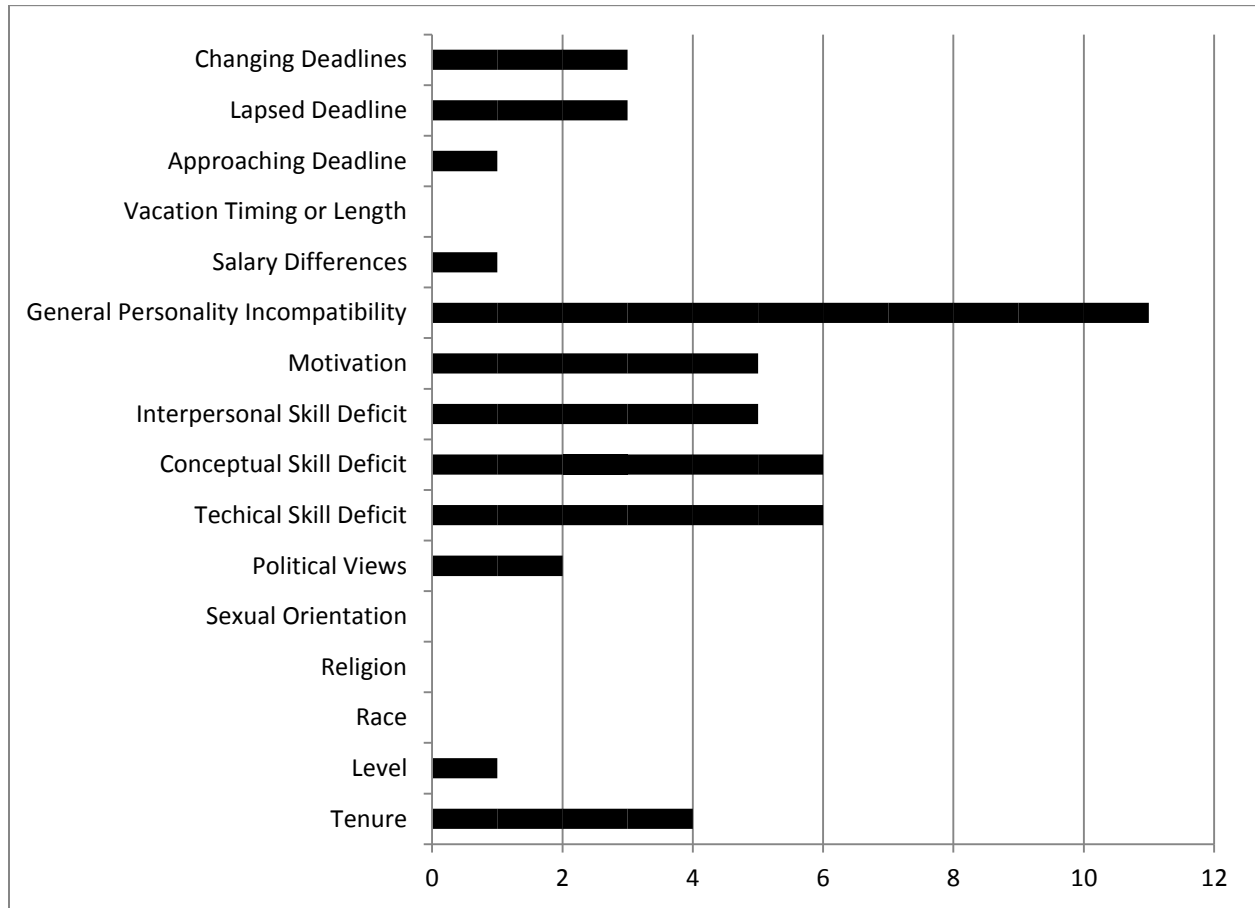

Figure 2. Most Important Perceived Cause for Conflict

While this would seem to be the most obvious cause for conflict, an interesting result appears from combining conflict categories that generally relate to aging engineers. When Tenure, Age, and part of Conceptual Skill Deficit[†] were combined they equal or surpass the General Personality Incompatibility category. It could even be argued that General Personality Incompatibility includes components of age related differences.

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[*] "Conceptual Skill Deficit" as used here only applies when elaborated by the engineer in the survey to apply to lack of knowledge in new technology or business/marketing trends, indicated in the "Other" category.

3.3 Conflict Resolution Methods

Aside from issues in project timing, where the best resolution is getting a supervisor or team to intervene, the best resolution from the surveyed engineering leaders is a direct confrontation in private. The direct confrontations were stern or disarming, chosen by the engineering leader to match their and their adversary's personalities. These results can be seen in Figure 3.
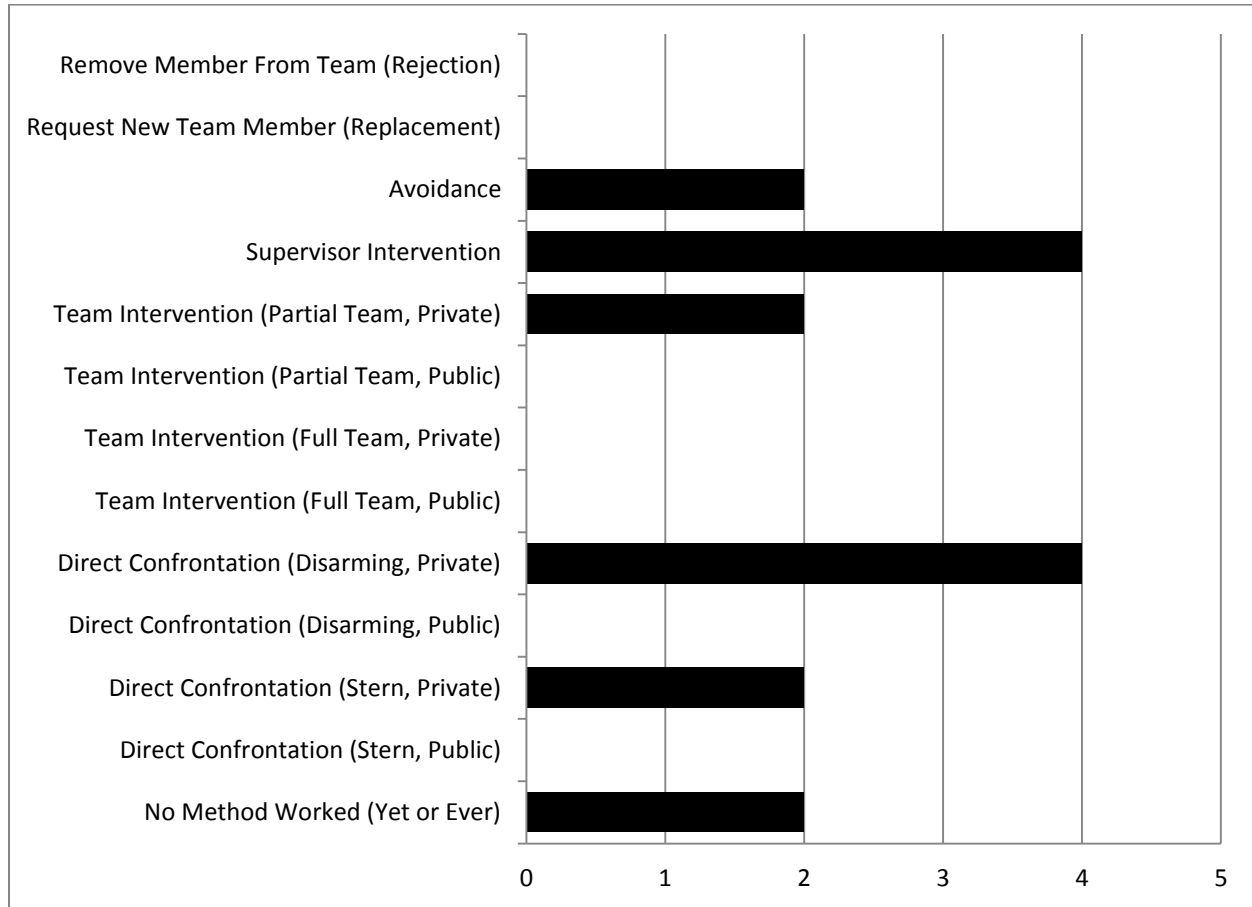

Figure 3. Perceived Best Conflict Resolution Methods

In addition to this general result, it was observed that regardless of the young engineer's leadership style, if they were under the age of twenty-six they were only able to resolve serious issues through supervisor or team intervention.

4. Discussion

A few interesting results were borne from section 3.1, such as the discovery that as young engineering leaders age they seem to become more democratic in their leadership style. However, before this could be declared a definitive result it will warrant further study.

The most interesting result from this study came from section 3.2, which is that regardless of age or level differences an engineering leader who has less tenure than a subordinate almost always

creates conflict. This was a factor that was not considered in the Kunze and Bruch study [5]. This tenure difference will warrant future research, whether it be to rule it out as a false positive or to help determine preventative measures for the conflicts that arise from it.

From section 3.3 comes the rediscovery that direct, private confrontations have a greater affect in conflict resolution over anything done in a public setting. This result only serves to confirm a concept that is so well established that is has been adopted by self-help books [8]. The simplest breakdown of the best possible resolution methods paired to the most likely cause of conflict can be represented by Figure 4 below.
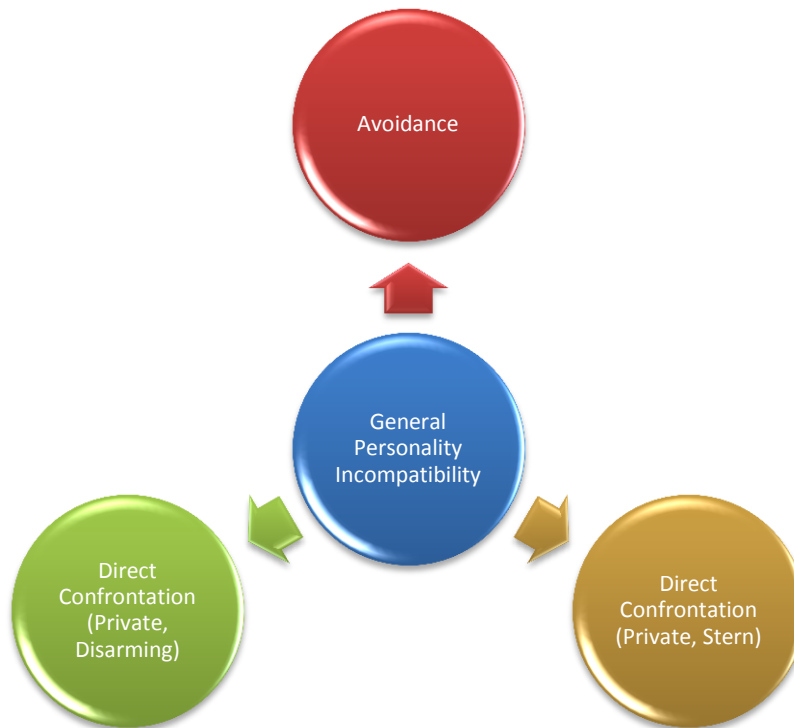
Figure 4. Most common conflict cause with its best discovered resolution methods

5. Conclusion

Conflicts arise from many possible areas in the automotive industry, mainly general personality differences; but young engineering leaders should always try to be aware of age and tenure based sources as an underlying or supplemental cause.

As most young engineering leaders use a Directive leadership style, a face-to-face meeting in private is the best method of resolving conflicts. Those who utilize this style must also keep in mind that using a supervisor or team to intervene may also prove effective.

As young engineering leaders age their style will likely change, something that must be kept in mind when heading off against conflicts. Of all the results found from this study the most important advice to take away is: persist. Conflicts may not immediately be quelled, but with time, and some trial and error, they will always come to a peaceful resolution.

6. Acknowledgements

Appendix A

Team Member Conflict

Reasons For Conflict
Select all of the reasons you believe a conflict has/was started with the troublesome team member you previously described, during the entirety of the time you had to work with them.

- ☐ Age
- ☐ Tenure
- ☐ Level
- ☐ Race
- ☐ Religion
- ☐ Sexual Orientation
- ☐ Political Views
- ☐ Technical Skill Deficit
- ☐ Conceptual Skill Deficit
- ☐ Interpersonal Skill Deficit
- ☐ Motivation
- ☐ General Personality Incompatibility
- ☐ Salary Differences
- ☐ Vacation Timing or Length
- ☐ Approaching Deadline
- ☐ Lapsed Deadline
- ☐ Changing Deadlines
- ☐ Other: _____

Figure 5. Screenshot of Survey for Conflict Sources Sent to Young Engineers

Appendix B

Conflict Resolution Methods

Conflict Resolution Attempts
Select all the ways you tried to resolve the tension with your troublesome team member.

☐ Direct Confrontation (Stern, Public)

☐ Direct Confrontation (Stern, Private)

☐ Direct Confrontation (Disarming, Public)

☐ Direct Confrontation (Disarming, Private)

☐ Team Intervention (Full Team, Public)

☐ Team Intervention (Full Team, Private)

☐ Team Intervention (Partial Team, Public)

☐ Team Intervention (Partial Team, Private)

☐ Supervisor Intervention

☐ Avoidance

☐ Request New Team Member (Replacement)

☐ Remove Member From Team (Rejection)

☐ Other: [   ]

Figure 6. Screenshot of Survey for Resolution Methods Sent to Young Engineers

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