

THE ANALYSIS OF THE TRANSLATION OF SCIENTIFIC AND TECHNICAL TERMINOLOGY IN AUTOMOBILE RACING

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ABSTRACT

Based on the translation of terms of automobile racing in China, as well as the author's own translation practice, this paper summarises the characteristics and the translation methods of scientific and technical terms in automobile racing. It also analyzes the relevant examples in order to provide some reference for the translation of scientific and technical terms in automobile racing.

Keywords: automobile racing, terminology translation, scientific and technical translation

1. Introduction

Formula One, the highest level of motor sport, represents not only the highest level of competition in modern motor sport, but is also an important benchmark for the highest level of development in modern automotive technology, especially in terms of automotive aerodynamics. (He, 2013). With Chinese driver Zhou Guanyu joining the Alfa Romeo F1 team this season, becoming the first Chinese driver in history, Formula One has become even more popular in China. However, Formula One, as an overseas sporting event, the extensive terminology has created a hindrance to the promotion and development of motorsport in China. According to the Oxford Advanced Learner's Dictionary, terminology refers to the set of technical words or expressions used in a particular subject. Due to the differences in the expressions of Chinese and English racing technical terms, the quality of the translation of scientific and technical terms in automobile racing can affect the promotion and popularity of Formula One in China. In this paper, we will start from the lexical characteristics and translation methods of scientific and technical terms in automobile racing and combine them with certain translation cases to explore the translation of scientific and technical terms in automobile racing.

2. The Lexical Characteristics of Scientific and Technical Terms in Automobile Racing

In 1987, based on subject disciplines, Hutchinson and Waters divided ESP (English for special purpose) into three main branches, English for Science and Technology (EST), English for Business and Economics (EBE) and English for Social Studies (ESS). Automobileracing English can be classified as sci-tech English, and its lexical features are similar to those of technical vocabulary. Vocabulary is the basic problem that translators must solve when translating. Seemingly simple vocabulary can sometimes be an obstacle and a stumbling block when translating. It is important to analyse the lexical characteristics of motorsport technical terms before translating them in order to deliver an accurate target-text.

After reading the *2022 Formula One Technical Regulations*, the author found that the lexical characteristics can be classified into the following four main categories.

2.1 Professional Terminologies

The professional terminologies refer to precise and narrowly defined terms used in automobile racing only, as shown in Table 1. Translators often need to have a background knowledge in automobile racing to translate these terms, otherwise the target-text may not be as clear as it should be.

Table 1. The translation of professional terminologies

Terminology (English)	Translation (Chinese)
Formula One	一级方程式
race calendar	赛历
circuit	赛道
steward	赛会干事
power unit	动力单元
free-practice	自由练习
super-licenses	超级驾照
starting grid	发车顺位
pole position	杆位

2.2 Generic Terminologies

Generic terminologies refer to those terms that can be used in a wide range of different disciplines and may have the same or different meanings in different disciplines, as in Table 2. When translating such terminology, translators should pay attention to the field to which the

source-text belongs in order to choose the appropriate meaning when translating.

Table 2. The translation of generic terminologies

Terminology (English)	Translation (Chinese)
front and rear axles	前轴和后轴
aerodynamic component	气动部件
fuel system	燃油系统
brake system	刹车系统
four stroke system	四冲程发动机
thermal melting tire	热熔胎
aerodynamic package	气动套件
brake duct	制动冷却气流通风道
down force	下压力
ground effect	地面效应

2.3 Acronyms

The composition of English acronyms draws on the features of English phonology and English morphology, and on the basis of the combination of phonology and morphology, they seek to present characteristics such as easy to read, easy to understand and easy to remember, and to achieve the real purpose of English lexical acronyms, i.e., simplicity and clarity (Meng & Ren, 2019). Meanwhile, English acronyms, with their short, concise and meaningful qualities, have taken on significant importance in automobile racing English, as shown in Table 3. Translators need to pay attention to the accuracy, scientific and conciseness of word meanings when translating such terms.

Table 3. The translation of acronyms

Terminology (English)	Full Name (English)	Translation (Chinese)
FIA	Fédération Internationale de l'Automobile	国际汽车联合会
RADAR	Radio Detection and Ranging	雷达

ICE	Internal Combustion Engine	内燃机
BBW	Brake-By-Wire	线控制动
DSQ	Disqualify	成绩取消
DNS	Do Not Start	未起跑
DNF	Do Not Finish	未完成比赛
ERS	Energy Recovery System	动能回收系统

2.4 New Terminologies

Terms in automobile racing contains many new terminologies. These terms often arise as a result of the constant development of motorsport and the emergence of new technologies, as shown in Table 4. Translators often have difficulties in translating such terms, so they should keep up to date with the latest motorsport background knowledge and consult the information in a timely manner to avoid any mis-translations.

Table 4. The translation of new terminologies

Terminology (English)	Translation (Chinese)
Grand Prix	大奖赛/格兰披治
HANS	头颈部支撑系统/汉斯系统
HALO	Halo 系统
DRS	可调节尾翼
BOX	进站
magic button	魔法按钮

3. The Translation Method of Scientific and Technical Terminologies in Automobile Racing

As the scientific and technical terminologies in automobile racing is characterised by a wide range of meanings, translators need to have a wide range of professional knowledge and flexible translation methods in order to make the target-text both concise and accurate.

According to the general trend of Chinese and Sci-Tech English translation, the main methods of translating are: literal translation, free translation, transliteration, form translation, and zero translation. The following section will give examples of these translation methods in scientific and technical terminologies in automobile racing.

3.1 Literal Translation

The direct translation method is a relatively common translation method for racing technology terms, which usually retains the characteristics of source-language culture and can accurately preserve the content of source-text. However, the direct translation method usually requires the target-text reader to have a certain degree of pre-supposed knowledge, otherwise the situation of not knowing the meaning of the target-text may occur.

Example 1:

ST: lollipop

TT: 棒棒糖

In daily life, lollipop refers to a hard round or flat candy made of boiled sugar on a small

stick. However, in automobile racing, lollipop refers to the instruction tool used by the mechanics to indicate the driver's entry and exit when the car is pitted. As the tool has an oval round head and a long tube at the bottom, it resembles a lollipop. Thus, the method of literal translation is adopted, and the source-text is translated as “棒棒糖”, which retains the characteristics of source-language culture to the greatest extent possible.

Example 2:

ST: power unit

TT: 动力单元

As defined in the *2022 Formula One Technical Regulations*, "power unit" means "The internal combustion engine and turbocharger, complete with its ancillaries, any energy recovery system and all actuation systems and PU-Control electronics necessary to make them function at all times. The “power unit” is made up of several different components, so the word “unit” is translated as “单元” by the method of literal translation, which accurately and vividly expresses its characteristics of being made up of several components.

Example 3:

ST: ERS (Energy Recovery System)

TT: 动能回收系统

The words “energy” and “system” in the source-text are not difficult to understand and translate, but the translation of “recovery” is very important. According to the *2022 Formula One Technical Regulations*, ERS means a system that is designed to recover energy from the car, store that energy and make it available to propel the car. Therefore, by choosing the method of literal translation, to translate “recovery” as “回收”, the noun in source-text can be replaced by a verb in target-text, and the dynamic process of "recovery" can be vividly expressed.

3.2 Free Translation

Free translation is a common method of translation and is often used in the translation of scientific and technical terms in automobile racing. Terms translated using the free translation method are usually easy for the target-text reader to read and understand.

Example 4:

ST: aerodynamic component

TT: 空气动力组件

In this terminology, the translation of “component” is very important, because if we follow the literal translation, there is no suitable word in the Chinese meaning of “component”. Therefore, according to the definition of aerodynamic component in the *2022 Formula One Technical Regulations*: All parts of the car in contact with the external air stream, the term “component” here means “all parts of the car”. The free translation method is used to translate it as “组件”. This makes it easier for the target-text reader to understand the meaning and characteristics of the term.

Example 5:

ST: four stroke engines

TT: 四冲程发动机

In daily life, stroke usually means “a single movement of the arm when hitting sb/sth”, but if the term is translated as “四拍打发动机”, the target-text reader will be at a loss.

Therefore, after consulting, the translator found that a stroke is the action of a piston traveling the full length of its locomotive cylinder or engine cylinder in one direction. In the field of

automobile racing, it is usually translated as “冲程”, therefore, using free translation to translate “four stroke engines” as “四冲程发动机” can facilitate the target-text reader’s understanding of the terminology.

Example 6:

ST: BOX

TT: 进站

The most common meaning of box is a container made of wood, cardboard, metal, etc. with a flat stiff base and sides and often a lid, used especially for holding solid things.

However, it is clear that in the field of automobile racing it is inappropriate to translate it as “盒子”. In addition to this, box in the sporting context refers to an area on a sports field that is marked by lines and used for a particular purpose. The translator therefore translates box as pit stop, which allows the target-text reader to quickly understand the meaning of source-text. In automobile racing, the area refers to the pit area. Box is usually found in the team radio where the racing team communicates with the drivers during the race. To save time in communication, box usually defaults to a command for the driver to drive the car back to the pits. Therefore, the translator translates box as “进站”, which allows the target-text reader to quickly understand the meaning of source-text.

3.3 Transliteration

The transliteration method is often used to translate new foreign vocabularies, and in the English to Chinese translation refers to a translation method that preserves the characteristic pronunciation of the English source-text in the Chinese target-text, which is also very common in the translation of scientific and technical terminology in automobile racing.

Example 7:

ST: Venturi Effect

TT: 文丘里效应

Venturi effect refers to the reduction in fluid pressure that results when a fluid flows through a constricted section of a pipe, which is named after the discovery of Italian physicist Giovanni Battista Venturi. In target-language, if the term “Venturi Effect” is translated in literal translation or free translation, the target-text would become very complicated and not easily understood by the target-text reader. Therefore, the transliteration method was chosen to translate it as

“文丘里效应”。

Example 8:

ST: Marshal

TT: 马修

In automobile racing, marshal refers to the track crew whose main responsibility is to check the safe operation of the track, including keeping an eye on spectators to ensure they are not a danger or a danger to the drivers in the race, putting out fires, removing parked cars and waving various flag signals to inform drivers of track conditions. Due to the complexity of their work, they are translated as “马修” by transliteration method. In the target-text, “马” can refer to the road, which in the racing world means “track”, while “修” can refer to “repair”. In this way, it retains the original meaning of the source-text while reflecting its characteristics.

Example 9:

ST: HANS system

TT: 汉斯系统

HANS is an acronym in scientific and technical terminology of automobile racing terminology, which stands for Head And Neck Support, a device that protects the driver in Formula One cars. In translation, it is often transliterated as “汉斯系统”. For racing enthusiasts, they will understand the HANS system is a device that protects the driver on a racing car, but for others, they need to consult information to understand it. Therefore, I think that a note (头颈部支撑系统) could be added after “汉斯系统” to help the target-text reader to better understand the source-text.

Form Translation

In automobile racing, many parts of the car are usually translated by means of a form translation due to their special shape, so that the target-text reader can understand their meaning intuitively.

Example 10:

ST: X-Wing

TT: X 形翼

The X-Wing is an X-shaped airfoil introduced by the Formula One Tyrrell team in 1997.

Its special shape was designed to increase the downforce of the car to improve cornering speed. Due to its specific shape, the “X-wing” is translated as “X 形翼”, which retains the character of the component in a vivid way.

Example 11:

ST: T-bar

TT: T 架

The T-bar is a component located on the race car, usually above the driver’s cockpit, and is used to mount the race car’s on-board camera. Because of its resemblance to the shape of the letter “T”, it was translated as “T 架” in the method of form translation, which in order to facilitate the understanding and memorisation of the target-text reader.

Example 12:

ST: Hairpin turn

TT: U 形弯

Hairpin turn refers to a kind of corner on a racing track, because the direction of the car will change 180 degrees after the turn, so it is usually translated as “U 形弯” in the method of form translation, this translation can make the target-text understand the meaning of source- text vividly.

3.5 Zero Translation

Zero translation is common in the translation of scientific and technical terms, where the source-text term goes directly into the target-text because it should have been translated, but for some reason could not be, e.g., the common term GPS (Global Positioning System).

Similar terms in motorsport need to be translated using the zero translation method.

Example 13:

ST: HALO

TT: HALO

The common meaning of halo is a circle of light shown around or above the head of a holy

person. It means “光环” in Chinese. However, this translation is clearly inappropriate in the field of automobile racing. HALO is a 50 mm diameter device in Formula 1 cars with three pivot points welded to the front of the cockpit and the rear of the left and right sides. It is translated as “HALO” in a zero translation way, so that even without the translation, racing enthusiasts can intuitively understand its meaning.

Example: 14:

ST: T-Tray

TT: T-Tray

The T-tray is an area of the racing car design. As this area of the car covers a wide range of parts and is designed differently in each team, it was not possible to find a general translation for it, so a zero-translation method was used to translate it as “T-tray”, which is more intuitive and easier to understand for fans who understand racing car design.

4. Conclusion

Mastering the translation of scientific and technical terminology in automobile racing is of great significance to the promotion of racing culture and Formula One in China. It is not only a key point but also a difficult one, requiring translators to have a high level of translation literacy and ability, and also a certain degree of understanding of racing knowledge. Only in this way can the accuracy of the translation of racing technology terms be continuously improved, thus helping the promotion and development of racing culture in China.