23 work needs, and the extent to which their needs were satisfied. Their analysis of work need fulfilment indicated strong support for the notion of growth needs, moderate support for existence needs, but somewhat weak support for relatedness needs. As predicted by ERG theory, Wanous and Zwany found workers with high satisfaction of their relatedness needs had the greatest need for growth.

Two findings reported by Wanous and Zwany (1977) failed to support ERG theory. First, the level of satisfaction with existence needs was unrelated to relatedness needs, whereas those whose existence needs were most satisfied should have had the greatest relatedness needs. Second, individuals with the greatest relatedness satisfaction rated relatedness needs as more important than did those with lower relatedness satisfaction, which is the opposite of the theoretical prediction.

As Schermerhorn, Hunt, and Osborn (2000, p. 112) pointed out, the theory “may help to explain why … workers’ complaints focus on wages, benefits, and working conditions—things relating to existence needs. Although these needs are important, their importance may be exaggerated because the workers’ jobs cannot satisfy relatedness and growth needs.”

**Evaluation**

- ERG theory is a simpler and more readily testable theory than Maslow's hierarchical theory.
- The notion that failure to satisfy needs at one level can lead the individual to emphasise more concrete needs is a valuable one.
- The three major types of needs (especially growth needs) are defined vaguely, making it hard to assess the extent to which needs have been satisfied.
- Numerous strategies can be used to satisfy any of the major needs, and it is not possible to predict which strategy any given person will select.

**HOMEOSTASIS: TEMPERATURE AND HUNGER**

The French physiologist Claude Bernard noticed that the body’s internal environment generally remains almost constant in spite of large changes in the external environment. This observation led to much work into the phenomenon of homeostasis, which is the tendency for an individual's internal environment to remain fairly constant. The word “homeostasis” comes from two Greek words: “homos” meaning “same” and “therme” meaning “heat”.

One of the most obvious examples of homeostasis is body temperature, which in humans is normally very close to 98.6 °F or 37 °C. This is the case in spite of the fact that the external temperature in the United Kingdom can vary by as much as about 54 °F or 30 °C between winter and summer. There are numerous other forms of homeostasis, including regulation of the body’s water supply, its oxygen concentration, and its concentration of nutrient substances such as glucose. The concentration of glucose in the bloodstream needs to be between 60 and 90 milligrams per 100 cubic centimetres of blood. If it falls below this range, then coma and death can result. If it consistently exceeds this range, then diabetes or some other disease is likely to follow. In similar fashion, death can occur if our body temperature remains considerably above or below its normal level for several hours, or if we are totally deprived of water for 4 or 5 days.
In view of the crucial importance to us of maintaining appropriate levels of food, water, and warmth, it is not surprising that we have complex systems which monitor and regulate each of these factors. As Carlson (1994) pointed out, the regulatory mechanisms within the body allowing homeostasis to occur all involve four key features:

1. A system variable. This is the characteristic (e.g., temperature) that needs to be regulated.
2. A set point. The ideal or most appropriate value of the system variable.
3. A detector. The actual or current value of the system variable needs to be assessed.
4. A correctional mechanism. This serves to reduce or eliminate the discrepancy between the actual value and the ideal value.

All these regulatory mechanisms are present in central heating systems, which are designed to regulate temperature. The thermostat is set to the chosen temperature, and it detects deviations between the actual and chosen temperatures. When the temperature falls too low, the boiler of the central heating system is activated to restore the chosen temperature.

Two key general points need to be made before we consider in detail the homeostatic mechanisms involved in temperature regulation and hunger. First, what we find in humans are typically only approximations to homeostatic processes. As Kalat (1998, p. 270) pointed out, these processes, “are not exactly homeostatic, because they anticipate future needs as well as react to current needs … For example, in a frightening situation that might call for vigorous activity, you begin to experience a cold sweat even before you start to move.” In addition, as many of us have found to our cost, it can be hard to maintain a given body weight. Accordingly, it may make more sense to think in terms of a set zone rather than a highly specific set point.

Second, homeostatic systems for regulation of warmth, food, and water are all characterised by redundancy, meaning that destruction of part of the system can be compensated for by other parts of the system. In other words, most homeostatic systems contain several mechanisms which are jointly responsible for preserving homeostasis. This makes complete evolutionary sense, because failures of homeostatic systems are often followed by death.

**Temperature regulation**

Temperature regulation is of very great importance to humans. For example, consider what happens if someone suffers from a high fever over a long period of time. That person is at risk of dying, because the brain centres involving in regulating heart rate and breathing are sensitive to high temperatures. Exposure to very low temperatures can cause extensive damage to the layers forming cellular membranes, so that they cannot recover even after thawing has taken place. However, regulation of our body temperature is not absolutely precise. For example, our body temperature varies slightly during the course of the day, tending to be highest in the evening and lowest in the middle of the night (see Chapter 4).

Why do humans typically have a body temperature of 37 °C? There would be some advantages if we had a higher